

A COGNITIVE - SEMANTIC ANALYSIS OF THE
ENGLISH PREPOSITION *IN*

by

Ariadna M. Drozdowicz

submitted for the degree of M.Phil.
in the Department of English Language
of the University of Glasgow

© Ariadna M. Drozdowicz

June 1998

ProQuest Number: 13815578

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 13815578

Published by ProQuest LLC (2018). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

GLASGOW
UNIVERSITY
LIBRARY

11533 (copy 1)

A B S T R A C T

The thesis presents a lexico-semantic analysis of the English preposition *in* within the framework of Cognitive Grammar. Fifty-six uses of *in* are analysed, comprising spatial as well as abstract senses. The preposition is regarded as a unified concept whose meaning is manifested via a radial category of senses, involving various levels of abstraction. The category is organised according to the principles of mental imagery, metonymic and metaphorical processes. The role of image schemas in underlying the conceptual structure of the preposition *in* is experimentally demonstrated. The results indicate that the 56 uses of *in* are structured by the image schemas for CONTAINER, PART-WHOLE and PATH. The semantic analysis of the three senses comprises configurational as well as relational parameters of atemporal relations. The preposition *in* is defined on the basis of the three image-schematic gestalts.

C O N T E N T S

	Page
Abstract	2
Contents	3
List of Tables and Figures	9
Typographical Conventions	10
<u>Chapter One: Introduction</u>	11
1.1	Orientation
1.2	Spatiality in language and cognition
1.3	Prepositions in the Cognitive Paradigm
1.4	Summary of Chapter One
<u>Chapter Two: Theoretical Prerequisites</u>	17
2.1	Orientation
2.2	The philosophical background
2.2.1	Introduction
2.2.2	The theory of absolute space
2.2.3	The theory of relative space
2.2.4	The theory of phenomenological space
2.2.5	Conclusions
2.3	The Cognitive Paradigm
2.3.1	Introduction
2.3.2	Language and philosophy
2.3.3	The holistic nature of the Cognitive Paradigm
2.3.4	Language and reality

2.3.5	Mental imagery	24
2.3.6	Meaning and categorisation	26
2.3.6.1	Semantic categories	27
2.3.6.2	Prototype	28
2.3.6.3	Metonymy and metaphor	30
2.3.6.3.1	Metonymy	
2.3.6.3.2	Metaphor	31
2.3.7	Conclusions	32
2.4	Prepositions in Cognitive Linguistics	
2.4.1	Introduction	
2.4.2	Prepositions as atemporal relations	33
2.4.3	Polysemy	
2.4.3.1	Defining polysemy	
2.4.3.2	Approaches to polysemy	34
2.4.3.2.1	Brugman	35
2.4.3.2.2	Lindner	36
2.4.3.2.3	Hawkins	
2.4.3.2.4	Herskovits	37
2.4.3.2.5	Vandeloise	38
2.4.4	Conclusions	40
2.5	Summary of Chapter Two	41

Chapter Three: A Cognitive Semantic

Analysis of the English Preposition *in*:

<u>Part One</u>		42
3.1	Orientation	
3.2	The theory of image schemas	43
3.2.1	Introduction	
3.2.2	Defining image schemas	
3.2.3	Image schemas and their transformations	45
3.2.4	The Invariance Hypothesis	46

3.2.5	Conclusions	47
3.3	Evidence for the reality of image schemas	48
3.3.1	Introduction	
3.3.2	Psycholinguistics	
3.3.3	Cognitive Psychology	
3.3.4	Developmental Psychology	49
3.3.5	Conclusions	51
3.4	Experiments	52
3.4.1	Introduction	
3.4.1.1	Description of the experiments	53
3.4.2	Experiment One	55
3.4.2.1	Results and Discussion	57
3.4.3	Experiment Two	60
3.4.3.1	Results and Discussion	62
3.4.4	Experiment Three	65
3.4.4.1	Results and Discussion	68
3.4.4.1.1	CONTAINER	69
3.4.4.1.2	PART-WHOLE	70
3.4.4.1.3	MERGING and FULL-EMPTY	71
3.4.4.1.4	FORCE	
3.4.4.1.5	PATH	
3.4.5	Conclusions to experimental work	73
3.5	Summary of Chapter Three	75

4. Chapter Four: A Cognitive Semantic

Analysis of the English Preposition *in*:

Part Two 78

4.1	Orientation	
4.2	Descriptive tools	
4.2.1	Introduction	
4.2.2	The fifth dimension of mental imagery: designation and trajector-landmark organisation	

4.2.3	Configurational and relational properties of prepositional predicates	80
4.2.3.1	Configurational properties of trajector and landmark entities	81
4.2.3.1.1	Trajector configurations	
4.2.3.1.2	Landmark configurations	82
4.2.3.1.3	Geometric descriptions	83
4.2.3.1.3.1	Geometric descriptions of trajector configurations	84
4.2.3.1.3.2	Geometric descriptions of the landmark configuration	
4.2.3.1.4	Functional properties of the trajector and the landmark	86
4.2.3.2	Relational properties of the predicate <i>in</i>	
4.2.3.2.1	Force Dynamics	87
4.2.4	Conclusions	89
4.3	The category structure of the preposition <i>in</i>	90
4.3.1	Introduction	
4.3.2	The preposition <i>in</i> as a polyseme	
4.3.3	The preposition <i>in</i> as a radial category	91
4.3.4	The image-schematic structure of the preposition <i>in</i>	92
4.3.5	The figurative senses of <i>in</i>	94
4.3.5.1	The domains	
4.3.5.2	The metaphors	94
4.3.6	The category IN-1	98
4.3.6.1	Introduction	
4.3.6.2	Schema IV: 3DIM, porous, bounded, cylinder landmarks	100
4.3.6.2.1	Schema V: non-reflexive trajectors	

4.3.6.2.2	Schema VI	101
4.3.6.2.2.1	Schema VI A: metaphorical extensions	
4.3.6.2.3	Schema VII: the prototype	102
4.3.6.2.3.1	Schema VII A: metaphorical extensions	
4.3.6.2.4	Schema VIII: reflexive trajectors	103
4.3.6.3	Schema IX: 3DIM, porous, bounded, channel landmarks	104
4.3.6.3.1	Schema X: the hiding landmarks	
4.3.6.3.2	Schema XII: displaying landmarks	105
4.3.6.4	Schema XIII: non-porous landmarks	
4.3.6.4.1	Schema XIV: bounded landmarks	106
4.3.6.4.2	Schemas XIV A, XV A: metaphorical extensions	107
4.3.6.4.3	Schema XVI: non-bounded landmarks	108
4.3.6.5	Schema XVII: 2DIM, bounded landmarks	
4.3.6.6	Conclusions	109
4.3.7	The category IN-2	110
4.3.7.1	Introduction	
4.3.7.2	Schema XIX: the local prototype	
4.3.7.2.1	Schema XIX A: metaphorical extensions	111
4.3.7.3	Schema XX: the 2DIM landmark	
4.3.7.4	Schema XXI: 1DIM landmarks	112
4.3.7.5	Conclusions	
4.3.8	The category IN-3	113
4.3.8.1	Introduction	
4.3.8.2	Schema XXIII: the local prototype	
4.3.8.3	Schema XXIV: 0DIM landmarks	
4.3.8.3.1	Schema XXIV A: metaphorical Extensions	114

4.3.8.4	Conclusions	116
4.3.9	Summary	
4.4	The concluding remarks	117
4.4.1	Introduction	
4.4.2	Previous definitions of the spatial preposition <i>in</i>	
4.4.2.1	Non-cognitive approaches	
4.4.2.2	Cognitive approaches	
4.4.3	The definition of the preposition <i>in</i> - a proposal	118
4.4.3.1	Links among superordinate schemas	119
4.4.3.2	Links among prototypical schemas	120
4.4.3.3	Links among peripheral schemas	
4.4.4	Summary	121
	<u>References</u>	122

LIST OF TABLES AND FIGURES

Table 1	Descriptions of 12 image schemas in Experiment 1	56
Table 2	Mean ratings of appropriateness of 12 image schemas to the bodily experience of <i>in</i>	57
Table 3	The 56 uses of the English preposition <i>in</i>	62
Table 4	The three groups of senses of the preposition <i>in</i>	63
Table 5	Groups of <i>in</i> examples established on the basis of image-schematic profiles	67
Figure 1	The schematic structure of the category IN-1	98
Figure 2	The schematic structure of the category IN-2	110
Figure 3	The schematic structure of the category IN-3	113
Figure 4	Links among the three superordinate schemas of the preposition <i>in</i>	119
Figure 5	Links among the five prototypical schemas of the preposition <i>in</i>	120

TYPOGRAPHICAL CONVENTIONS

Conceptual metaphors

italicised capitals
e.g. *MORE IS UP*

Examples

italics
e.g. *He is in bed.*

Image schemas

capitals
e.g. CONTAINER

Technical terms

underlined small letters
e.g. active zone

1. C H A P T E R O N E:

Introduction

1.1 Orientation

The aim of this Introduction is to present what lies behind the author's motivation in choosing spatial relations as a subject of investigation within the Cognitive Paradigm.

The discussion of motivation can be divided into two stages:

- first, the exploration of the importance of spatiality for language and cognition (Section 1.2);
- second, a demonstration of how prepositions are of relevance to the framework adopted (Section 1.3).

1.2 Spatiality in language and cognition

One general motivation lies with the apparent primacy of space in language and cognition: given the privileged place that space occupies in language and in man's cognitive system, it seems perfectly justified to investigate this part of the lexicon. It is a truism that space always surrounds us, that we are always part of it; indeed, all objects, states, events and human actions should be seen against the backdrop of space. Therefore, in a trivial way, language and cognition, on the one hand, and space, on the other hand, are interconnected in that language/cognition are anchored into space; each speech event or cognitive process takes place in space (and time). Less trivially, however, this bond is manifested in the privileged place that space occupies in language and in man's cognitive system.

The variety of uses that are made of spatial words in nonspatial contexts offers just one example of the extent to which space pervades language. The recognition of this primacy of space for natural language actually led a number of linguists to posit that spatial expressions are more basic, grammatically and semantically, than various kinds of nonspatial expressions. This claim is commonly referred to as the localist hypothesis (Lyons 1977: 718-724). According to this view, not only should the temporal and metaphorical meanings of a number of words be understood in terms of/be derived from their spatial meaning, but also what is

usually thought of as being metaphorical can be brought within the scope of localism. As such, verbs denoting a change of state can be analysed as verbs of motion, and even grammatical categories such as tense, aspect, possessive and existential constructions can, at least partly, be proven to have a locative origin. While the full-fledged version of localism seems rather controversial, it is an incontrovertible fact that, semantically, the spatial use of a number of lexical items is the basic one in that an understanding of their meaning in nonspatial contexts is based precisely on this spatial meaning.

This “weaker version of localism” is also advocated in more recent, cognitive approaches to lexical semantics, where, roughly speaking, the meaning of a word is the conceptual content that this word addresses, which, in turn, is the result of our mind processing, ordering, and interacting with reality.¹ Lakoff and Johnson point out that

“[...] the prime candidates for concepts that are understood directly (i.e. without metaphor) are the simple spatial concepts such as UP” (1980: 56)

and that

“[...] we typically conceptualise the non-physical in terms of the physical (e.g. the spatial).”² (Lakoff and Johnson 1980: 59)

Langacker (1987) can be cited in the same vein, when he points out that a number of spatial terms have been extended from the spatial domain to others, including the abstract domains.³

Even for conceptualisations outside the scope of actual lexicalization, the primacy of space can often be demonstrated in a straightforward way:

- the system of locative inclusion seems psychologically basic to part-whole and class inclusion hierarchies (Miller and Johnson-Laird 1976: 220);
- people are often inclined to visualise or spatialise their thought. Think of the use of pictorial representations instead of propositional descriptions in representing

¹ Since Cognitive Semantics is the framework of this thesis, I will not go into detail here, but I refer the reader to Section 2.3.

² Similarly, Lakoff (1990:73) claims that many abstract concepts, even such basic concepts as time, quantity, state, change, action, cause, purpose, means, and modality, arise from metaphorical mappings of spatial concepts.

³ Langacker (1987) cautions us that although concepts in nonspatial contexts may be understood in spatial terms, and in that sense be more basic, this does not mean that the domain of spatial experience is more basic than other domains (domains of colour or temperature). For instance, although *in* in *the jewels in the box* grounds the temporal metaphor *in two weeks*, this does not necessarily mean that one domain of experience is more basic than any of the others.

conceptual knowledge. Moreover, much of our reasoning seems to rely on visual thinking (Miller and Johnson-Laird 1976: 77);

- irrespective of whether they have a label in the lexicon or not, the representation of a number of object concepts includes such spatial concepts as size, place and movement (Cuyckens 1991: 13).

If we agree that space occupies such a privileged place both in language and in man's organisation of conceptual knowledge, it seems justified to investigate how spatial information is actually reflected in them; in other words, how precisely space is conceptualised and how it is lexicalised (what the language of space consists of).

An inquiry into the language of space may include the following topics:

- the morphological specification of spatial attributes of objects. In this respect, Indo-European languages may be among a minority in not having obligatory spatial morphemes, i.e. in not treating spatial features on a par with tense, gender, person, and number (Miller and Johnson-Laird 1976);

- the lexical resources for referring to space. These may include:

- the elaborate system of place names for geographical and political areas;
- lexical items for dealing with space in which people live and work. Among them are containers (rooms, prisons, boats), pathways (aisles, streets, tunnels), and boundaries (beaches, borders, blockades);
- labels for points of the compass, for units of length, area, volume, for such properties as height, length and width;
- lexical items that express spatial relations (prepositions, but also verbs like *reach*, *cross*) (Miller and Johnson-Laird 1976: 376-379).

For obvious reasons, it is not possible in this present work to make a thorough exploration of the way space is represented in language and thought. I will restrict myself to an investigation of the lexical resources used to refer to space. More specifically, in this thesis, I will confine myself to analysing the semantics of the English preposition *in*.

Investigating the semantics of the language of space means that I am going to transgress into the conceptualisation of space on the cognitive view, where the semantic structure and the structure of our conceptual knowledge are not taken to be different in kind. Semantic structures are conceptualisations shaped for symbolic purposes, in other words, they are conceptualisations that are labelled by a symbol (i.e. a lexical item).

In sum, within the context of this thesis, the distinction between things lexical and things conceptual is artificial. This study should be regarded as an inquiry into lexicalised conceptualisations of space.

1.3 Prepositions in the Cognitive Paradigm

There exists a strong relation between the emergence of the Cognitive Paradigm and the revived interest in prepositions. The centrality of prepositions within the framework of Cognitive Grammar relies on the fact that prepositions, as spatial expressions, are highly representative of the nature of linguistic meaning (conceptualisation in this paradigm comprises linguistic meaning, in other words, linguistic interpretation equates with conceptualisation).

The overall assumption underlying the study of prepositional meaning is that all semantic extension, at some time, has originated from spatial senses. Therefore, the study of our conceptual means to structure concrete space supplies us with clues for our mental organisation of semantic space in general (Talmy 1983: 226). Consequently, special attention should, first of all, be paid to the analysis of the spatial senses of prepositions in order to provide ourselves with a firm structural basis for semantic extensions. In doing so, I do not purport to draw a dichotomous distinction between concrete and abstract senses of the lexical item. Spatial senses are viewed as the anchoring point for conceptualisation. They constitute the impetus of the category and are responsible for establishing the prototype (Vandeloise 1991).

The essential point is that all conceptualisation, that is, all mental experience, is ultimately based on physical experience gained from our physical functioning in a spatial environment. Lakoff (1987: 267) calls it preconceptual experience. Conceptualisations are ultimately grounded in and structured by nonpropositional, preconceptual bodily experience (Johnson 1987). This experience is mentally coded in image schemas, which function as cognitive models for all higher-order mental constructions, that is, they give meaning even to those utterances which deal with the most abstract and complex situations. Consequently,

"[...] every thought is ultimately linked to the structure of spatial concepts which grow out of our preconceptual structure of experience."
(Zelinsky-Wibbelt 1993: 5)

All abstract concepts are metaphorizations or metonymies of semantically concrete, spatial predications. In other words, abstract expressions are indirectly

understood in terms of directly meaningful, preconceptual models which are constrained by the perception of physical relations.

1.4 Summary of Chapter One

Given such a theoretical orientation (Sections 1.2-1.3), it is inevitable that attention should be focused on those lexical items the function of which is to symbolise conceptualisations of spatial relations, and which, through semantic extension, are employed in the construal of relations in more abstract domains.

In the following chapters, I will try to demonstrate that spatial prepositions are representative of the Cognitive Paradigm. Lexico-semantic analyses of spatial prepositions provide information on the nature of linguistic meaning and convincingly illustrate the cognitive stand on the crucial notions of polysemy, categorisation, sense motivation and extension. By the same token, analysing the internal structure of prepositional categories provides some insight into the semantic structure of the lexicon and language processing in general.

2. C H A P T E R T W O:

Theoretical prerequisites

2.1 Orientation

The aim of Chapter Two is threefold. In Section 2.2, two schools of thought, objectivism and subjectivism, will be presented and their respective interpretations of the relation between man and the physical world (space) will be discussed. In Section 2.3, correspondences will be revealed between philosophical and linguistic thought. Emphasis will be laid upon recent developments in linguistic theory that point to the primacy of the cognitively natural description of meaning and hence advocate the notion of relativistic and subjective space. Consequently, four assumptions of the Cognitive Paradigm, relevant to the current analysis, are to be discussed. These are:

1. the holistic nature of the Cognitive Paradigm;
2. the relation between language and reality;
3. mental imagery;
4. meaning and categorisation.

In Section 2.4, the subject of the current study will be defined within the framework of Cognitive Linguistics. Some solutions to the question of prepositional polysemy will be provided. The summary of Chapter Two is presented in Section 2.5.

2.2 The philosophical background

2.2.1 Introduction

An outline of four philosophical approaches to the notion of spatiality will now be presented. In Section 2.2.2, the theory of absolute space will be discussed. In Section 2.2.3, I will present the theory of relative space. Merleau Ponty's "Phenomenology of Perception" is discussed in Section 2.2.4.

2.2.2 The theory of absolute space

The notion of absolute space derives from Isaac Newton (Tatarkiewicz 1993). His approach has been reinforced by the theory referred to as substantivalism, which argues for the reality of the spatial substance. There are four basic aspects pertaining to the notion of absolute space: its independence, unity, immutability and primacy.

2.2.3 The theory of relative space

Antisubstantivalism, or the theory of relative space, is the approach to be quoted in order to challenge the postulates of the theory of absolute space. The main claim here is that there is no such substance as space. Antisubstantivalism does not maintain that there are no spatial properties and relations, or that things do not possess spatial features. It is only the reality of any entities that have no intrinsic features except spatial ones that is rejected. The theory of relative space describes space as being dependent upon matter for its existence. Space exists only because matter does. Moreover, space is viewed as fragmentary rather than unitary. The core idea is that every material object has associated with it its own private and dependent space, which it carries around with itself, and which interpenetrates with the spaces of other objects.

Gottfried Leibniz is among the most radical supporters of relativism (Tatarkiewicz 1993). His claim can be reduced to the assertion that neither time nor space can have a separate existence. In other words, space is to be viewed as merely the separation between objects having no existence in its own right.

Another version of relativism is that favoured by Emmanuel Kant (Tatarkiewicz 1993). He claims that spatial features are subjective phenomena; they are the projection by the mind onto the physical world, rather than something that exists there independently of us, and is newly discovered by us. Spatiality is dependent upon the mind; it is not absolute, but relative.

Bertrand Russell draws our attention to the role of the senses in perception by distinguishing between reality and the appearance of the objects of our perception. He also denies the existence of absolute space by advocating a plethora of sensual spaces. Special emphasis should be laid on the "deceptive" role of vision, which, according to Russell, is responsible for the plethora of perspectives an object can acquire (Tatarkiewicz 1993). At the same time, he claims that it is scarcely so in the case of touch, smell, taste, or sound. In other words, there arises an interesting

claim that vision is the most pervasive as well as the most deceptive sense responsible for our perception of space.

Albert Einstein's Theory of Relativity provides an extreme version of the subjectivist theories of space. The Theory postulates that space is not absolute, but determined by objects. Consequently, time, movement, forces, as well as spatially extended entities are viewed as relative (Tatarkiewicz 1993).

2.2.4 The theory of phenomenological space

The third theory concerning the nature of space is based on Maurice Merleau Ponty's "Phenomenology of Perception" (Maciejczak 1995). Ponty postulates a relationship between space (or the outside world) and man, which can be summarised in the following way: the world is inseparable from the subject, who is nothing else but its projection; the subject, on the other hand, is inseparable from the world, which projects itself .

A more detailed discussion of this theory reveals the following:

- the body is the subject of perception, as well as the source of orientation in space; in other words, the intentional body locates us in the world;
- the world is a horizon in which the world and existence constantly confirm each other;⁴
- the structure of the field of immediate perception is a dynamic structure of interrelated entities;
- each object has its oriented space, its here and possible there. The orientation of space is determined by the phenomenological body as a system of potential activity;
- the body is a system of possible actions whose position is determined by the tasks imposed by a concrete situation;
- there exists communication between the body and the environment. The data are shaped in such a way as to enable a clear perception and field of manoeuvre. Whatever is of no importance for a given aim - an actual location of the body - is neglected. Thus, to have a body means to have a certain way of knowing space, whose source is the process of anchoring the subject in the world (Maciejczak 1995: 34-47).

⁴ The notion of horizon is discussed in Section 4.4.2.4.

2.2.5 Conclusions

The three approaches presented in Sections 2.2.2-2.2.4 above form a continuum varying according to the degree to which the subjective element is present in the perception of space. The theory of absolute space appears to be the most “dehumanised” of all the hypotheses evoked. Relativistic theories of space underline the subjective element in the interpretation of spatiality. They stress the importance of the human factor in interpreting the outside world, paying special attention to the role of sensual input, perspective and personal experience. The phenomenological interpretation of perception results in viewing space as a dynamic relationship between the body and the outside world.

In Section 2.3, I will try to demonstrate that the traditions of objectivism, subjectivism, and phenomenology have been synthesised in the Cognitive Paradigm into the “myth of experientialism” (Lakoff and Johnson 1980; Johnson 1987).

2.3 The Cognitive Paradigm

2.3.1 Introduction

In Section 2.3.2, the influence of the philosophical tradition of objectivism and subjectivism upon schools of linguistics will be discussed. In Sections 2.3.3-2.3.6, the four basic assumptions of the Cognitive Paradigm will be presented.

2.3.2 Language and philosophy

" Time and space provide the basic co-ordinate system within which all experience can be located, and much of the machinery of language is devoted to making such localizations communicable." (Miller and Johnson-Laird 1976: 28)

I will now try to determine which mode of understanding reality should be adopted in order to be able to analyse human spatial language.

The two main assumptions concerning the notion of spatiality emerging from the philosophical outline presented in Section 2.2, objectivism and subjectivism (relativism), have had correspondences in linguistic approaches to the relation between language and the world.

The schools of linguistics based on the prerequisites of objectivism resulted in defining linguistic meaning with the tools of formal logic and mathematics.⁵ Formal semantics, the term used to refer to all schools of semantics other than the functional approach of Cognitive Linguistics, views language as an autonomous module, independent of other mental processes (Saeed 1997: 299). By the same token, language components are to be analysed in separation from each other. Meaning is understood in terms of conditions based on reference and truth; truth consists in the correspondence between symbols and states of affairs in the world. The association between symbols and things in the world can be described in an objectively correct way. Meaning represented in terms of a logical metalanguage is autonomous, conceptually simple, abstract and mathematically well-formed. It is consequently reduced and unnatural in not comprising the richness of detail contributed by the broadly understood context.

Recent developments in Cognitive Psychology on the structure of natural categories brought about the demise of objectivism in many areas of linguistics (Rosch 1973, 1978). The realisation of the relative and subjective nature of meaning resulted in the reappraisal of spatial cognition and the establishing of a new paradigm.

“ There is nothing to be gained from trying to say how it is that sentences map onto the world. If, as the history of logical empiricism shows, we cannot give a one-to-one mapping of cognitively meaningful sentences onto states of affairs existing objectively in the world as it is in itself, than we ought to quit pursuing theories of objective truth and reference. What we can do is to apply what we are learning about category structure, basic level conceptualisation, image-schematic patterns, and the role of imaginative structures and projections in all our understandings.” (Johnson 1991: 18)

What follows is a brief summary of the four aspects of Cognitive Linguistics that are relevant to the current investigation.

2.3.3. The holistic nature of the Cognitive Paradigm

The guiding assumption of Cognitive Grammar is the holistic and continuous nature of all human behaviour and its underlying structure. Considered a more specific faculty intertwined with all mental processes, natural language is claimed to be a part of the overall cognitive capacity of human beings. Linguistic structure

⁵ For a detailed presentation see Lakoff (1987), Saeed (1997).

should thus be studied as a reflection of cognitive processing in general and hence a source of information about cognitive abilities.

" Fundamental cognitive abilities and experientially derived cognitive models have direct and pervasive linguistic manifestations, and, conversely, language structure furnishes important clues concerning basic mental phenomena."
(Langacker 1993:1)

Cognitive Linguistics rejects the principle of economy characteristic of formal schools. There is no dichotomy between linguistic and extralinguistic knowledge. Consequently, it is impossible to delimit the meaning of a lexical item precisely, as linguistic knowledge is a part of knowledge in general.

" The distinction between semantics and pragmatics (or between linguistic and extralinguistic knowledge) is largely artificial, and the only viable conception of linguistic semantics is one that avoids such false dichotomies and is consequently encyclopaedic in nature." (Langacker 1987: 63)

The traditional dichotomy of a grammar and a lexicon is discarded as a case of exclusionary fallacy. Instead,

"[...] lexicon, morphology, and syntax form a continuum of meaningful structures whose segregation into discrete components is necessarily artificial."
(Langacker 1991: 3)

The speaker's linguistic system is an inventory of conventional units structured according to general cognitive abilities, such as abstraction and categorisation (Section 2.3.6).

The holistic character of Cognitive Semantics is best conveyed by image schemas (Johnson 1987). Their nonpropositional, dynamic and basically embodied nature lies at the foundation of human thinking, understanding and reasoning. Image schemas arise from the preconceptual level to permeate our imagery and thus function as a viable tool for explaining human conceptual processes reflected in linguistic meaning (Section 3.2).

2.3.4 Language and reality

In this section, I once again turn to the notions of subjective and objective reality, and attempt to determine their participation in representing spatial expressions. To this end, I will employ the notion of experientialism.

Lakoff and Johnson (1980) describe experientialism as

"[...] capable of satisfying the real and reasonable concerns that have motivated the myths of both subjectivism and objectivism but without either the objectivist obsession with absolute truth or the subjectivist insistence that imagination is totally unrestricted." (Lakoff and Johnson 1980: 228)

According to the "myth of experientialism", reality is not what language describes. Linguistic means are not in absolute correspondence to the outside world. Language expresses how speakers have mentally implemented the common experience of the specific environment they live in. Linguistic expressions cannot and do not stand in simple and direct relation to states of affairs in real or possible worlds; rather, linguistic expressions invoke a speaker's construal, conceptualisation, or mental representation of states of affairs (Lakoff 1987). Consequently, the semantic distinctions suggested by our linguistic utterances do not agree with the real physical extension of the configured parts, but with the conceptual schematization.

The above considerations point to correspondences between subjectivist (relational) theories of space in philosophy (Section 2.2.3) and the Cognitive Paradigm in linguistics. Lakoff (1987) endorses the ideas expressed by Kant in underscoring the mentalistic character of linguistically conveyed reality.

"[...] emphasis on interaction and interactional properties shows how meaning is always meaning to a person. And this emphasis on the construction of coherence via experiential gestalts provides an account of how understanding uses the primary resources of the imagination via metaphor [...]." (Lakoff and Johnson 1980:228)

Johnson (1987) continues the phenomenological tradition of Merleau Ponty in putting forward a claim for the nonpropositional character of meaning structured by bodily patterns called image schemas (Section 2.2.4).

Having admitted that linguistic reality is subjective and relativistic in being human-determined, I nevertheless claim that absolute, Newtonian space is utilised by people (Herskovits 1986). People make use of the interpretation of the world in objective terms to the extent that it serves as the ultimate point of reference, the anchoring system for human encoding and decoding processes. In other words, I do not deny the existence of objective reality. However, I reject the claim of one-to-one correspondence between language and reality. In taking a middle approach, I claim that linguistic structures refer to our concept of reality. Our awareness of the "ideal world" serves linguistic purposes to the extent that it

provides the speaker with the point of reference, which becomes modified during language production.

“[...] lexical concepts are mental entities that mediate between words and their extralinguistic referents.” (Cuyckens 1991: 11)

In other words, a “common-sense” view of the physical world underlies our perception and every linguistic realisation of its physical aspect. In this view, space is three-dimensional, isotropic and Euclidean. The ground extends to infinity, with air above and rocks below the surface. The ground supports solid objects, which are discrete wholes with a well-defined surface, a shape and a location in space. Relations between objects are determined by gravity (Herskovits 1986: 27).

The canonical description presented above may be fundamental, but it does not correspond to the reality conveyed via language since what people say refers to appearances and conceptualisations.⁶ The only justification, then, for having a fundamentally objective view of the world is its role as the background for appearances and conceptualisations.

Having determined the background role of objective reality and the decisive function of conceptualisation in the linguistic description of spatial relations, I now turn to the nature of those conceptual processes.

2.3.5 Mental imagery

The assumption here is that the semantic distinctions conforming to our linguistic utterances do not correspond to the real physical extensions of entities people refer to, but to their conceptual schematizations. It is our conception of reality, not the real world per se, that is relevant to linguistic semantics (Langacker 1987:19). One of the techniques of this approach draws on abstracting from the vast amount of highly complex and variegated information available to us, and focusing on those aspects which, according to conventional experience, figure as salient, essential in a particular type of situation, as well as from the speaker's perspective. Schematization of this kind is the fundamental principle underlying the linguistic expression of spatial configurations (Talmy 1983: 225); it involves the selection of those spatial properties of a scene which, in a given domain and situation, are essential to how we view it as a whole, while the remaining

⁶ The concept of reality advocated by Cognitive Linguistics is illustrated by Lakoff's (1987) notion of ICMs.

properties, being non-essential, do not participate in this process. This selection process relies predominantly on geometrical and topological properties (Section 4.2.3.1). However, as I noted in Section 2.3.4, Euclidean geometry does not always hold for linguistically conveyed spatial relations. It can only serve as an ideal against which the processes of encoding and decoding are set. Consequently, conditions of the use of spatial expressions cannot be reliably extrapolated from the objective, geometrical properties of extralinguistic situations. Instead, we have to look for cognitive principles that make it possible to conceptualise certain extralinguistic situations in alternate ways.

The term imagery refers to the fact that people can conceive of a situation according to different images, which results in different expressions to describe the same situation.

“ Our capacity to construe the same content in alternate ways is referred to as imagery; expressions describing the same conceived situation may nonetheless be semantically quite distinct by virtue of contrasting images they impose on it.” (Langacker 1991: 4)

Several dimensions of imagery can be discerned:

1. The level of specificity

For example, *She was inside the room* is more specific than *She was in the room*, because *inside* tends to imply total inclusion within the boundaries of the landmark.

2. Scope, i.e. the array of content implied

For instance, *The door opened easily* necessarily implies an agent, whereas *The door opened* does not.

3. Background assumptions and expectations, i.e. connotations

This dimension pertains to connotations (consider “stingy” vs. “thrifty”). In the context of social hierarchy, for example, *beneath* has a more negative connotation than *below*.

4. Perspective, relating to various aspects:

a) Viewpoint, which includes vantage point (deixis) and orientation. Orientation pertains to the alignment with respect to the axes of the visual field (or a comparable coordinate system for other domains). Imposing a particular orientation on physical space allows us to locate entities relative to certain axes (Section 4.2.3.1.3.2). Vantage point is the position from which the scene is viewed. The choice of vantage point imposes on the scene an alignment of

foreground and background. In other words, vantage point relates to deixis and may involve cases of deictic shift (Section 4.2.3.2.1).

“ In construing a situation for linguistic purposes, the speaker is able to conceptualise how it would appear from different vantage points and to portray it accordingly, irrespective of his actual vantage point.” (Langacker 1987: 48)

b) Subjective versus objective construal.

An entity is construed subjectively when the conceptualiser himself is absorbed in the process of conception. It is construed objectively if it is fully distinct from the conceptualiser. Subjectivity is a matter of degree and objectively construed entities may receive a more subjective construal. This semantic shift is called subjectification.

Two types of subjectification are of special interest to us:

“ The first type of subjectification is exemplified by the contrast between two senses of *across*:

(a) Harvey crawled across the table.

(b) A famous movie star is sitting across the table.

[...]

In (b) it is the conceptualiser who traces along the path to compute the trajector's fixed location, but he does so only mentally. [...] objective physical motion by the trajector is converted under subjectification to abstract subjective motion by the conceptualiser.

[...]

The next example exemplifies a second type of subjectification.

(a) The balloon rose slowly.

(b) The hill gently rises from the bank of the river.

In (b) it is the conceptualiser who moves subjectively through the scene, mentally tracing an upward path along the hill's expanse, thus imposing a notion of directionality on the static situation.”

(Langacker 1991: 217-18)

The first type of subjectification will appear in the case study in Chapter Four.

5. Designation and trajector-landmark organisation make up the fifth dimension of imagery, which offers the basic tools for the semantic analysis in this study, and will thus be discussed in Section 4.2.2.

2.3.6 Meaning and categorisation

Set within the “myth of experientialism”, Cognitive Grammar departs from the view that the structure of reality as reflected in language is the product of the human mind (Saeed 1997: 301). Meaning is based on the conceptual framework of the speaker, and truth and falsity are relative to the way an observer construes a

situation. Cognitive, biological and pragmatic principles are employed to explain how the speaker attributes a certain salience, relevance and typicality to the participants in a given scene, and how, in accordance with this attribution, the objects participate in certain relations to fit (at least to some extent) the structure of mental categories. Those mental categories emerge from experience and are reflected in cognitive domains. In other words, defining meaning is tantamount to stating how linguistic expressions are determined by conceptualisation, and how conceptualisation is constrained by the speaker's environment, his perspective and his purposes (Section 2.3.4).

2.3.6.1 Semantic categories

The semantic meaning of a lexical item may be represented as a network. The use of a lexical item is considered as a point of access to a network, where typically one of its modes will be activated. Other modes in the network will also be activated, with different degrees of salience. Chances of activation depend on the context and on the relative proximity (association) within the network. This accounts for the intuition that some concepts are more inherently associated with a particular word than others. "The semantic core" of a lexical item is defined in terms of centrality and likelihood of activation in the network.

"The multitude of specifications that figure in our encyclopaedic conception of an entity clearly form a gradation in terms of their centrality to our understanding of the notion." (Langacker 1987: 66)

If linguistic knowledge is an integrated part of knowledge in general, then the meaning of a lexical item cannot be precisely delimited (Section 2.3.3). Instead, a concept can be represented as a category of senses.

Cognitive Semantics views categorisation as a continuous and gradual process. The traditional, Aristotelian approach to category membership in terms of yes/no dichotomous judgements has been proved inadequate for a natural description of both natural and linguistic categories. The cognitive alternative is a reliable representation of a category structure that should provide both an exhaustive description of all senses of a lexical item as well as natural generalisations over different senses (Langacker 1987, 1988; Taylor 1989). In other words, categorisation should be devoid of rampant polysemy, of a kind that would include contextual variations among senses of a lexical item. As indicated by Geeraerts (1988), the two approaches, focus on highly differentiated general

meanings and focus on maximally general meanings, are complementary rather than in conflict. Langacker's network model of category structure explicitly incorporates both aspects. Thus, Langacker envisages two kinds of relations between the senses of a linguistic form, viz. relations of instantiation, or elaboration (the one meaning elaborates, with greater specificity, a more abstract, schematic meaning), and relations of extension (certain specifications of the one meaning are suspended or modified in the extended meaning) (Section 4.3.3).

Consider profiles for *run* in *John ran* and *Fido ran*. The same predicate, *run*, designates two series of different configurations, one appropriate to a two-legged creature, and one appropriate to a four-legged one. These are distinct activities at a level of fine detail, yet at a level of grosser detail (ignoring the number of legs), they are perceived as similar. At an even more abstract level, these two processes are related to the process profiled by *run* in *The water is running*.

In a grammar of English, we need to represent the extent of conventional usage of *run* and *run*. The model of representation must reflect the extent to which those profiles comprise a unified concept respectively. To meet those requirements, the semantic representations of lexical items must have a complex structure, involving a network of both the particulars of usage, as well as the generalisations made about them at various levels of abstraction.

Recognition of a single, general meaning does not remove the need to identify more specific meanings (Taylor 1989). The specific meanings, though, tend to be arranged as a radial or family resemblance structure, which may feature a central sense (or senses) together with an array of elaborations of and extensions from this modified version of a prototype.

2.3.6.2 Prototype

A prototype is the best example of the category. It displays the highest number of features by which category members are defined. It is first learned by children and most easily recalled by adults (Rosch 1978).

“ Presumably, it is the meaning that is acquired first, and also most likely to be activated in a neutral context.” (Langacker 1988: 135)

In other words, a prototype is the “anchoring example” around which other members of the category are arranged.

“ Could it not be the case that we choose that meaning as prototypical that gives the best starting point for interpreting the various applications in which we encounter that item? [...] In that case, the prototype is that meaning that best enables us to make sense (literally, as an interpretative process) of the various ways in which words are used. Or, in other words, the prototype would have to be thought of as an interpretative perspective that helps us to interpret the uses of a word.” (Geeraerts 1992: 261-262)

Lindner (1982) assumes that we must list in the grammar all meanings a lexical item has, including the relations between them, where some are extended from others. Certain of the listed meanings will be more cognitively prominent: they will have a natural salience other meanings will not have. We might call these prototypical meanings; they are the meanings thought of first. The most salient meanings are often defined in the concrete domain (Section 4.3.2). They may be historically prior ones, as they are likely to be the most established (or entrenched) meanings, which are shared by the greatest number of speakers. However, in time, subsequent meanings may become just as established and salient (Section 4.3).

To sum up,

“ In forming a category people have the ability to make extensions (metaphorical and other) from a prototype. I further posit a capacity for abstraction - or schematization - to represent the commonality inherent in multiple experiences. [...] A complex category can be represented in terms of either Lakoff’s radial category or my own network model (the two being basically equivalent).[...] Schemas and prototypes are both essential to category structure, reflecting different aspects of a unified phenomenon.” (Langacker 1993: 2)

In the formation of a complex category, consequently, outward growth from the prototype tends to co-occur with upward growth (i.e. the emergence of more schematic notions).

Although extensions from the central sense cannot be predicted they can, nevertheless, be motivated.

“ The most radical prototype phenomena are radial categories. [...] The noncentral models are not predictable from the central model, but they are motivated by the central models and other models that characterise the links to the centre.” (Lakoff 1987: 153-154)

“ A theory of motivation is required, since the noncentral subcategories are neither arbitrary nor predictable from the central subcategory.” (Lakoff 1987: 379)

Prepositions as radial categories will be discussed in Section 4.3.3.

2.3.6.3 Metonymy and metaphor

Metonymy and metaphor are basic cognitive processes responsible for the elaboration and extension of senses within a category (concept).

2.3.6.3.1 Metonymy

Metonymy occurs when an expression that normally designates one entity is used instead to designate another, associated entity. The mapping occurs within one domain. The part may stand for the whole (*I need some wheels*). Alternatively, the whole may stand for the part (*My pencil broke*). The latter type of metonymy overlaps with the notion of active zones (Section 4.2.3):

“Metonymy largely overlaps with what I have called the active-zone phenomenon. An entity’s active zone, with respect to a particular relationship, comprises those portions of the entity that participate most directly and crucially in that relationship.”(Langacker 1993:31)

Consider the following example: *He is in the bedroom*. Obviously, only part of the landmark elaboration is referred to (the interior of the room). The boundaries do not participate in the relation described by *in*.

Other examples of metonymic relations include:

- a place for an institution e.g. *The White House gave no comment*;
- a producer for the product e.g. *Have you read the latest Vonnegut yet?*
- an object for the person using it e.g. *All officials under the crown*;

Despite the variety, metonymic relations are reflections of the same cognitive ability:

“Metonymy is basically a reference-point phenomenon. More precisely, the entity that is normally designated by a metonymic expression serves as a reference point affording mental access to the desired target (i.e. the entity actually being referred to).[...] By virtue of our reference point ability, a well-chosen metonymic expression lets us mention one entity that is salient and easily coded, and thereby evoke - essentially automatically - a target that is either of lesser interest or harder to name.” (Langacker 1993: 30)

Lakoff (1987) stretches the notion of metonymy to category structure. Quite often, a part of a category is used to comprehend a category as a whole:

“A major source of such [prototype] effects is metonymy - a situation in which some subcategory or member or submodel is used (often for some limited and intermediate purpose) to comprehend the category as a whole - in reasoning, cognition, etc.

Within the theory of cognitive models, such cases are represented by metonymic models.” (Lakoff 1987: 79)

Of crucial interest to me among metonymic models are so-called “typical examples”.

“Typical examples include cases like the following:
Robins and sparrows are typical birds.
Apples and oranges are typical fruits.” (Lakoff 1987: 86)

During the analysis of the preposition *in*, I will try to demonstrate, for instance, that a jar (a three-dimensional, porous, bounded, cylinder container) serves as a typical example of containers in general (Section 4.3.6.2.3). Abstract containing landmarks preserve the topology of the source domain (*Have you ever been in love?; He spoke in Russian.*) (Turner 1993).

2.3.6.3.2 Metaphor

Metaphor is a cognitive process of mapping across domains. Metaphor maps the structure of a source (or donor) domain onto a corresponding structure in a target (or recipient) domain. As such, metaphor is a basic cognitive ability that allows us to conceive and think of abstract concepts.

“Abstract reason is a matter of two things:
reason based on bodily experience, and
metaphorical projections from concrete to abstract domains.” (Lakoff 1987: 275)

If abstract experience and reasoning is basically metaphorical, then it goes beyond the objectivist mirror of external reality. The “imaginative” nature of human thought calls for an experientialist view of reason (Section 2.3.4).

“In domains where there is no clearly discernible preconceptual structure to our experience, we import such structure via metaphor. Metaphor provides us with a means for comprehending domains of experience that do not have a preconceptual structure of their own. A great many of our domains of experience are like this. Comprehending experience via metaphor is one of the great imaginative triumphs of the human mind. Much of rational thought involves the use of metaphoric models. Any adequate account of rationality must account for the use of imagination and much of imagination consists of metaphorical reasoning. Such an account is outside the realm of objectivist theories.” (Lakoff 1987: 303)

Since certain metaphors are so deeply entrenched in everyday human thought, Lakoff and Johnson (1980) call these “metaphors we live by”. They distinguish roughly three kinds of metaphors:

1. Ontological metaphors allow us to conceive of abstract concepts as concrete entities. Personification is a special type of ontological metaphor.
2. Structural metaphors map a particular structure of a source domain onto a more abstract target domain. For instance, an argument is often conceived in terms of war; life is often conceived as a journey; the body is understood as a container for emotions.
3. Oriental metaphors map the dimensions and configurations of oriented physical space onto more abstract domains. For instance, social hierarchies are often conceived in terms of *HIGH STATUS IS UP; LOW STATUS IS DOWN*.

Those metaphors are grounded in our everyday physical experience and they show different degrees of abstraction. For example: *AN ACTIVITY IS A PATH* is more general than *LINGUISTIC ACTION IS A PATH* (Section 4.3.5.2). Nevertheless, certain metaphors are associated (as the example suggests). In fact, those associations can be accounted for by reference to Langacker's model of schematization, where the commonality inherent in several metaphors (e.g. *LINGUISTIC ACTION IS A PATH; THOUGHT IS A PATH*) may result in a unifying and more schematic (abstract) metaphor (e.g. *AN ACTIVITY IS A PATH*). Schematization can be carried to various lengths, leading up to very abstract metaphors (e.g. *AN EVENT IS A PATH*). However, even those very schematic metaphors are grounded in everyday physical experience.

Metonymic and metaphorical processes may interpenetrate, rendering the distinction between metonymy and metaphor gradual rather than absolute. Goosens (1990) proposes a neologism metaphonymy for the interaction between metaphor and metonymy.

2.3.7 Conclusions

The four assumptions of the Cognitive Paradigm presented in Sections 2.3.2-2.3.6 will be applied to the semantic analysis of the preposition *in* in Chapter Four.

2.4 Prepositions in Cognitive Linguistics

2.4.1 Introduction

In Section 2.4.2, English prepositions will be defined from the cognitive stance. Next, the notion of polysemy will be discussed in an attempt to determine

how a lexico-semantic analysis of prepositions should be carried out (Section 2.4.3).

2.4.2 Prepositions as atemporal relations

In Cognitive Linguistics, the traditional grammatical classes are defined semantically.

“ An expression’s grammatical class is determined by the nature of its profile . A basic distinction is drawn between nominal and relational expressions, depending on whether they profile a thing (abstractly defined) or a relationship. [...]

Within the class of relational expressions, verbs are distinguished from such classes as adjectives, adverbs, prepositions, infinitives, and participles in virtue of designating a process as opposed to an atemporal relation. A process is characterised as a relationship followed sequentially in its evolution through conceived time, whereas an atemporal relation - whether simple (stative) or complex (comprising multiple component states) - views a scene holistically.” (Langacker 1991: 5)

The items I am concerned with (prepositions) are defined as atemporal relations. Evidently, they do not normally occur in isolation. Their landmark (ground) is elaborated by a noun (a thing defined as a bounded space in some domain), and their trajector (figure) is elaborated by a noun or a verb phrase (a process). The latter adds a temporal profile. In the sentence *The paint is in the jar*, the trajector is elaborated by the noun *paint*, while the landmark is instantiated by another noun, *the jar*.

Combining prepositions with actual landmark and trajector elaborations is not a random process. The semantics of the prepositions sanction the use of particular landmarks and trajectors:

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

2.4.3 Polysemy

2.4.3.1 Defining polysemy

Providing a semantic analysis of a prepositional category is tantamount to resolving the problem of polysemy. Polysemy is a gradable concept. In recognising distinct senses of a word, one has to face the fuzzy borderline

between ambiguity and vagueness. Ambiguity and vagueness may be seen as occupying opposite ends of a continuum (Section 4.3.2).

For example, the difference in meaning between the following uses of *in* appears rather small: *The camel is in the desert; We are in Scotland*. In those cases, *in* leans towards vagueness. In other words, a vague sentence/phrase is one which involves the same referent but different states of affairs.

On the other hand, the difference in meaning between the following uses appears more profound: *The paint is in the jar; We are leaving in April*. It takes more effort to think of a schema subsuming those two senses. In those cases, *in* leans towards ambiguity rather than vagueness. A sentence/phrase is ambiguous if it has distinct referents or different senses.

Metaphorically, vagueness and ambiguity may be perceived as proximity and distance between related senses.

Polysemy, homonymy, and ambiguity are three of the major issues that inevitably appear in any semantic analysis, and that have created diverse opinions among scholars. Polysemy is

“[...] as necessary to the study of meaning as are the semantic relations that exist among the words.” (Langacker 1987: 50)

In dealing with polysemy, scholars agree on the salience of context in determining which one of the senses is selected by the speaker/writer. However, a major controversial issue among scholars is whether the different uses of the prepositions correspond to separate, independent meanings, or whether those uses are all based on a common, or core, meaning, while the specific sense in a sentence is determined by the context.

2.4.3.2 Approaches to polysemy

In general, there seem to be three major approaches to polysemy. The first is the traditional view, which posits several meanings for each polysemous word without an attempt in consolidating those meanings. The other two are different versions of the core sense approach (Bennett 1975; Caramazza and Goyer 1976). There are also those treatments which have their roots in Rosch's (1978) theory of natural categorisation (Brugman 1981; Lindner 1982; Hawkins 1985; Herskovits 1986; Vandeloise 1991).

In the present work, the data of prepositional polysemy will argue for a rejection of the minimal-entry lexicon, minimal in terms of number of senses entered, and in favour of a multiple-entry lexicon, which is consistent with a conception of the lexicon as an encyclopaedia (Hawkins 1985: 286). Therefore, it seems appropriate to present some of the approaches to polysemy that have emerged within the Cognitive Paradigm. The approaches selected will be frequently referred to in Chapter Four of this thesis.

The subsections below will present the treatments of polysemy developed by Brugman (1981), Lindner (1982), Hawkins (1985), Herskovits (1986), Vandeloise (1991). The first three approaches maintain a polysemous bias, where meaning is viewed as a complex family resemblance structure and individual senses are described holistically and interactionally by means of image schemas and their transformations. The last two analyses clearly favour a monosemic bias, in which specific interpretations are pragmatically determined.

2.4.3.2.1 Brugman

In defining polysemy, Brugman (1981) draws a crucial distinction between polysemy, which is a shift of sense, and functional shift. She stresses the importance of functional shift, noting that semantic shift can result from a new syntactic environment. By the same token, her definition of polysemy overrides the distinctions between lexical categories in favour of the conceptual category. Nevertheless, the role of the lexical category “preposition” remains of great explanatory power, as all nonprepositional uses of a preposition are derived from one or other sense of the preposition (Brugman 1981: 1).⁷

Brugman’s study of the English lexical item *over* describes the preposition as a fairly complicated family resemblance structure, where the different senses are related as a chain of meanings. The polysemous item is described by means of pictorial representations which exploit

“[...] familiar spatial configurations existing in our experience of the world” (Brugman 1981: 3).

The semantic similarities between the various senses of *over* are established through similarity links and transformational links between schemas, resulting in a

⁷ Taylor (1989) acknowledges the general tendency in Cognitive Linguistics towards a semantic description of a unified concept at the expense of neglecting syntactic differences within a conceptual category.

chained hierarchical family resemblance structure imposed on the various senses of the word. Schemas are described at different levels of abstraction although no superschema subsuming the three central senses of the preposition *over* is provided (Section 4.4.2.1).

2.4.3.2.2 Lindner

Lindner's (1982) approach to polysemy is based on the theory of natural categorisation, or the prototype model of category structure. After reviewing many uses of *out* and *up*, she maintains that neither collapsing all configurations into only one, nor suggesting multiple distinct lexical items would be appropriate. Instead, she believes in representing the full range of conventional uses of prepositions/particles as well as the unity of those uses (Section 2.3.6.2). To avoid classification leading up to an excessively large and counter-intuitive lexicon, Lindner holds that we ought not to look for all possible differences in meaning, but to look for sameness as far as we can. In her conclusion, Lindner claims that natural categories of senses display various levels of abstraction. Central schemas subsume different uses of a lexical item, whereas they themselves can be subsumed by a higher-order superschema. In such a fashion, then, Lindner unifies the diverse meanings of the particles *out* and *up* in a network of semantic extensions.

2.4.3.2.3 Hawkins

Hawkins' (1985: 229-290) version of the theory of natural categorisation is what he calls "the central tendencies approach" (Hawkins 1985: 230). In this model, a natural category is defined not by clear boundaries, but by strong central tendencies internal to that category, and prototypes are only one of those central tendencies.

A natural category has two dimensions, vertical and horizontal, with significant central tendencies in each dimension. The vertical relation between category members is essentially that between superordinate and subordinate nodes in a taxonomic hierarchy. The horizontal dimension concerns relations between members at the same level of inclusiveness (Hawkins 1985: 232). It is this dimension that reflects the central importance of prototypes in category structure, a prototype being the central tendency within any given horizontal level of the category (Section 4.4.2.2). Thus, categories include both idealised prototypical

members and their approximations. Therefore, categories are to be defined not on the basis of their boundaries, but mostly by their clear cases because

“[...] non-prototypical members of the category share common attributes with structures both in and outside the category” (Hawkins 1985: 233).

Hawkins claims that the spatial predicates of a polysemous English preposition form a natural category.

“ The vertical and horizontal central tendencies characteristic of such a natural category have the significant effect of establishing certain primacy relations among the members of the category.” (Hawkins 1985: 263)

In brief, Hawkins (1985: 271) conceives of lexical disambiguation as a matter of probabilities determined by relations inherent in the prepositional category and modified by the interaction with context. His study, covering the majority of English spatial prepositions, is in line with the chained network of family resemblances proposed by Brugman (1981).

2.4.3.2.4 Herskovits

Herskovits (1986) proposes that the conceptual information attached to a spatial preposition should consist of an ideal meaning and a collection of use types:

“ The idea of an ideal meaning is that [...] it is manifested in all uses of the preposition, although shifted and distorted in various ways. [...] The whole prepositional category is structured by resemblance to an ideal relation; the spatial relation fulfilled in any given use of the preposition is distinctly derived from the ideal relation (it may be identical to it).” (Herskovits 1986:15)

Use types are

“[...] complex bundles of information corresponding roughly to various senses and idioms.” (Herskovits 1986: 32)

Those use types are classes of uses of spatial prepositions which are related to the ideal meaning. As an illustration, I give Herskovits’ analysis of *in*, which looks as follows:

ideal meaning: " inclusion of a geometric construct in a one-, two-, or three-dimensional geometric construct."

use types:

" spatial entity in container;
gap/object embedded in physical object;
physical object in the air;
physical object in outline of another, or of a group of objects;
spatial entity in part of space or environment;
accident/object part of physical or geometric object;
person in clothing;
spatial entity in area;
physical object in roadway;
person in institution;
participant in institution." (Herskovits 1986: 149)

Next to the ideal meaning and use types, there are also a number of what Herskovits calls "pragmatic near-principles", which play an important part in a full account of the semantics of spatial prepositions. Those principles are: salience, relevance, tolerance, and typicality. They do not refer as much to the speaker-hearer relation as they reflect, once again, the importance of the experiential context within which a spatial preposition should be understood.

Herskovits' analysis has affinities with the classical core sense approach in that it proposes one single, ideal meaning which is present in all the uses of a particular spatial preposition. Unlike in the core sense approach, this ideal meaning does not on its own make up the lexical entry of a preposition: the various shifted and distorted uses captured in the use types are also an integral part of the lexical information attached to the preposition. Moreover, each instance of the spatial preposition resembles, in some way, the ideal meaning, but the instances themselves are not interrelated through a family resemblance structure.

In the analysis to unfold in Section 4.3, I am going to demonstrate that the various instances of a spatial preposition can be proved to be related, and hence incline towards the family resemblance structure advocated by Brugman, Lindner and Hawkins, among others. Nevertheless, Herskovits' fine achievement of having explicitly demonstrated the importance of spatial conceptualisations will be frequently referred to in Chapter Four.

2.4.3.2.5 Vandeloise

Vandeloise (1991) describes spatial prepositions as complex concepts which behave like a family resemblance. Instead of an invariable set of defining features, most spatial prepositions are characterised in terms of mutually overlapping sets

of attributes. *Dans* (English *in*), for instance, expresses a CONTAINMENT relation: a complex concept whose definition employs the following attributes:

" The contained moves toward the container, and not vice versa.

The container controls the position of the contained, and not the other way round.

The contained is, at least partially, included in the container or in the convex closure of its containing part." (Vandeloise 1984:225)

The basic meaning of a given preposition is termed by Vandeloise its impetus. Vandeloise defines the impetus of a preposition as its original single *signifié*. The impetus involves a transparent and unambiguous correspondence between signifier and signified, which is at the beginning, diachronically speaking, of the development of the meaning potential for each preposition.⁸

Those three features need not be simultaneously present in the instances of *dans*, that is, they do not make a fixed set of criterial attributes. Instead, *dans* shows a network of overlapping featural configurations. However, Vandeloise restricts himself to those spatial prepositions with a fairly limited family resemblance structure. The complex concept CONTAINER/CONTENT characterising the French preposition *dans*, for instance, comprises only a limited set of possible attributes from which each of the mutually related featural configurations is made up. This, in turn, gives rise to a limited cluster of overlapping featural configurations.

In sum, the prepositional structure he proposes is that of a monosemous concept, where each of the featural configurations overlaps with all the others. This particular structure is sufficient only for a number of senses of spatial prepositions. Therefore, a functional-pragmatic interpretation of Cognitive Semantics, as advanced by Vandeloise, does not recognise that there is more flexibility in the way that extension from impetus to non-impetus uses occurs than is captured by naïve physics and pragmatic-experiential similarity alone. Many spatial and abstract uses of prepositions can best be made sense of if recognised as the reflection of image-schematic extensions and transformations (Section 4.3.4).

⁸ The notion of impetus can be related to Clark's (1973) experimental findings in Developmental Psychology, as well as to Johnson's (1987) *gestalt structures of image schemas*.

2.4.4 Conclusions

Complex structures of family resemblances arising from image schemas and their transformations, as discussed by Brugman (1981), Lindner (1982) and Hawkins (1985), will be applied to analyse the 56 uses of the preposition *in* in Chapter Four.⁹ Herskovits' (1986) notion of geometric descriptions and Vandeloise's concept of the CONTAINMENT gestalt will also be appreciated (Section 4.2).

⁹ Further references to cognitive analyses of prepositions (Cuyckens 1991; Boers 1994) will be made in Chapter Four.

2.5 Summary of Chapter Two

In Chapter Two, I have argued that an adequate account of meaning requires viewing objects as entities relative to our interactions with the world and our projections on it. It has been postulated that properties are to be interpreted as interactional rather than inherent. Categories should be viewed as experiential gestalts defined via prototype (Lakoff and Johnson 1980: 210). I have also pointed out that our experience is structured holistically in terms of experiential gestalts, whose dimensions emerge naturally from our experience (Lakoff and Johnson 1980).

1. C H A P T E R T H R E E :

A Cognitive-Semantic Analysis of the English Preposition *in*: Part One

3.1 Orientation

Chapter Three presents the first part of the lexico-semantic analysis of the English preposition *in*. The current chapter is divided into two parts. In Section 3.2, the theory of image schemas is presented. Sections 3.2.1-3.2.4 are devoted to defining image schemas. Section 3.3 provides evidence from Psycholinguistics, Cognitive Psychology and Developmental Psychology on the cognitive reality and relevance of image schemas.¹⁰

Section 3.4. presents a series of three experiments adapted from Gibbs et al (1994). The experiments are to demonstrate the cognitive reality of image schemas and their role in underlying the conceptual structure of polysemous words. Relations between cognitively salient image schemas will be proved to underlie image-schematic transformations motivating meaning extensions. As a result, the category structure of the English preposition *in* will be delineated. Three senses of the polysemous preposition will be distinguished on the basis of the underlying image schemas for CONTAINER¹¹, PART-WHOLE and PATH.¹² The relevance of other image schemas (FORCE and FULL-EMPTY) is to be indicated in motivating sense elaborations and extensions, as well as explaining

¹⁰ In this, I am consistent with Lakoff's (1990) "cognitive commitment", which emphasises the importance of incorporating data from various related disciplines, such as Psycholinguistics, Cognitive and Developmental Psychology for our understanding of language, and importance of the empirical evidence for the linguistic constructs.

¹¹ A clear distinction should be made between the following two constructs:

1. the superordinate CONTAINER schema, subsuming the three senses of the preposition *in*. In this sense, CONTAINER is understood as an experiential gestalt, whose internal structure motivates the category of the senses of *in*;
2. the basic-level CONTAINER schema, which motivates the meaning of the IN-1 category (Section 4.3.6). It is presumed to include most of the features of the CONTAINER gestalt (Section 4.3.4). By the same token, it is assumed to constitute the prototypical sense of the category.

¹² I do not exclude the possibility of there existing more senses of the preposition *in*. The three categories of senses are distinguished for the 56 uses of *in* that occur in the current analysis.

family resemblance links between senses of the polysemous item (Section 3.4.2.1).

3.2 The theory of image schemas

3.2.1 Introduction

Most theories of linguistic meaning assume a distinction between mind and body, where meaning is a fixed and determinate product. For example, semantic features are seen as having no inherent meaning, but are made meaningful by virtue of their connections to objects and events in the objective world (Section 2.3.2). Although people's sensory systems are sometimes viewed as contributing to how important conceptual distinctions that underlie linguistic meaning are acquired, few theories in Cognitive Psychology and Psycholinguistics acknowledge the role of human embodiment in motivating the concepts we have, or why linguistic symbols have the particular meanings they do.

Over the past ten years, cognitive linguists have begun to articulate their view that knowledge arises out of people's interactions with the world.¹³ Knowledge is seen not as being static, propositional and sentential, but as grounded in patterns of bodily experience. Section 3.2. is devoted to presenting the theory of those preconceptual patterns of experience.

3.2.2 Defining image schemas

" Recent empirical studies of categorisation, concept development, semantic structure and reasoning reveal the inadequacies of all theories that regard knowledge as static, propositional, and sentential. These studies show that conceptual structure and reason are grounded in patterns of bodily experience. Structures of our spatial/temporal orientations, perceptual interactions, and motor programs provide an imaginative basis for our knowledge of, and reasoning about, more abstract domains." (Johnson 1991: 7)

Those patterns are called image schemas (Section 2.3.3). They are different patterns of recurring bodily experiences that emerge through sensorimotor activity, and from our perceptual understanding of actions and events in the world.

¹³ The phenomenological tradition in Cognitive Linguistics is discussed in detail in Section 2.2.4.

Hence, image schemas are experiential gestalts, whose character is cross-modal (Johnson 1987).¹⁴

According to Lakoff and Johnson, image schemas are grounded in everyday physical experience, but their logic is also used to metaphorically structure abstract experience.

Langacker considers image schemas to be innate:

“ For my purposes I find it useful to speak of basic image-schematic abilities. Moreover, counter to Johnson and to Lakoff, I am inclined to regard these abilities as innate. Rather than being acquired, or extracted from everyday bodily experience, I think of them as being initially manifested in such experience, and indeed, as making it possible for any structured experience to occur in the first place.” (Langacker 1993: 3)

Image schemas can generally be defined as dynamic analogs of spatial relations and movements in space.¹⁵ They are derived from perceptual and motor processes, but they themselves are not sensorimotor processes. Instead, image schemas are primary means by which we construct or constitute order and are not

"[...] mere passive receptacles into which experience is poured."
(Johnson 1987: 30)

Image schemas are imaginative and nonpropositional in nature, and operate as organising structures of experience on the level of bodily perception and movement. They exist across all perceptual modalities, something that must hold for there to be any sensorimotor co-ordination in our experience. They are at once visual, auditory, kinaesthetic, and tactile.

“ Mental imagery is not merely visual. And image-schemas are kinaesthetic in nature, that is, they have to do with the sense of spatial locations, movement, shape, etc. independent of any particular sensory modality. Evidence for this comes from mental imagery experiments conducted with congenitally blind people.” (Lakoff 1987: 445)

In referring to image schemas, we emphasise means of structuring particular experiences schematically so that we can give order and connectedness to our perceptions and conceptions (Johnson 1987).

¹⁴ I reconcile the apparent contradiction by following both Johnson (1987) and Jackendoff (1983) in hypothesising that there is a prelinguistic form of representation, which is common to all modes of cognition. Jackendoff uses the term conceptual structure to refer to this level of representation.

¹⁵ They are dynamic in the sense that 1) they are structures of an activity by which the experiences are organised and comprehended, and 2) unlike pictorial images, they are flexible and can take a number of particular instantiations in different contexts (Johnson 1987).

Image schemas are presumably more abstract than ordinary images (rich images) and consist of dynamic spatial patterns that underlie the spatial relations and movement found in actual concrete images.¹⁶ Image schemas are emergent properties of unreflective bodily experience, while mental images are the result of more effortful cognitive processes. Mental images are generated by assembling the parts of the image, one part at a time.¹⁷

3.2.3 Image schemas and their transformations

Over two dozen (27) different image schemas and several image schema transformations appear regularly in people's everyday thinking, reasoning, and imagination (Johnson 1987; Lakoff 1987). Those image schemas cover a wide range of experiential structures that are pervasive in experience, have internal structure, and can be metaphorically elaborated to provide for our understanding of more abstract domains.

" Among some of the most prominent image schemas that are indispensable to any account of understanding and knowledge would be: object, figure-ground, container, cycle, force, balance, scalarity, interaction, centre-periphery. They should not be understood as discrete little atomic units , but rather as recurring overlapping patterns in the ongoing flow of our experience of the world. These are the imaginative contours of our experiential interactions." (Johnson 1991: 12)

Image schemas are often linked together to form very natural relationships through different image schema transformations. They play a special role in linking perception and reason. Lakoff (1987: 443) distinguishes the following image-schematic transformations: **PATH-FOCUS TO END-POINT FOCUS**, **MULTIPLEX TO MASS**, **FOLLOWING A TRAJECTORY**, **SUPERIMPOSITION**. Image schema transformations motivate particular extensions from a schema in the domain of physical space by virtue of their perceptive/cognitive naturalness:

¹⁶ In very many respects, image schemas are the same as lexical conceptual structures in Jackendoff's Conceptual Semantics. In that respect, image schemas are attributed with the role of being the link between experience and language. In other words, image schemas not only make metaphorical language possible; they make language itself possible.

¹⁷ An image is a form of representation specific to sight, and the object thereof is a specific token of a particular referent. Image schemas are associated with neither a specific mode of cognition nor any particular referent. We are assuming that image schemas are intentional, and as such, they serve as information structures that allow us to identify appropriate referents for a linguistic symbol. They are also patterns by which we organise our experience.

“ In short, these schema transformations are anything but arbitrary. They are direct reflections of our experiences, which may be visual or kinaesthetic.”
(Lakoff 1987: 443)

The concept of motivation must be differentiated from prediction, on the one hand, and arbitrariness, on the other hand. Motivation means that sense extensions are not arbitrary, but are constrained by the embodied image-schematic knowledge and by types of cognitive links relating different senses. The senses are related in at least three different ways: through image-schematic transformations, through metonymic relations, and through metaphorical instantiations of image schemas in different domains of people's visual experiences (Section 2.3.6).¹⁸

3.2.4 The Invariance Hypothesis

One of the important theoretical ideas in Cognitive Semantics is that image schemas and their transformations provide part of the foundation for thought, reasoning and imagination. The same image schemas can be instantiated in many different kinds of domains because the internal structure of a single schema can be metaphorically understood. Image schemas have an internal structure which determines the roles those image schemas can play in structuring various concepts and in patterns of reasoning.¹⁹

The same word is used for various domains because they are structurally related by the same sort of underlying image schemas, and are metaphorically elaborated from them.

“ When we understand something as having an abstract structure, we understand that structure in terms of image schemas. In particular, I maintain that: Categories (in general) are understood in terms of CONTAINER schemas.²⁰

¹⁸Furthermore, Herskovits (1986) proposes “sense shifts” and “tolerance shifts” as pragmatic transformations of prepositional meaning (Section 2.4.3.2.4). The “sense shift” accounts for the senses of a spatial preposition that only perceptually resemble the conditions of the “ideal” prepositional meaning. For example, the relations in *The wrinkles on his forehead* only perceptually resemble the relations of contiguity and support described as the “ideal” meaning of *on*, but this resemblance motivates the use of *on* in this example. The “tolerance shifts” are gradual deviations from the “ideal” meaning in terms of geometric angle or distance. For example, the expression *The pear is in the bowl* is not strictly true when the pear is on top of other fruit in the bowl, and thus outside the boundaries of the bowl itself. However, it is allowed (it is “almost true”), since the distance between the pear and the upper boundary of the bowl is very small.

¹⁹ It is important to note that image schemas are not abstract semantic primitives or propositional symbols. The propositional symbols are arbitrary, in the sense that their internal structure does not play any role in what they mean and how they interact. They are inherently meaningless, and they are finite in nature. In contrast, image schemas are not arbitrary, in the sense that they have an internal structure that plays a crucial role in what they mean and how they interact. Image schemas are grounded in bodily experiences, inherently meaningful, and analog in nature (Lakoff 1987).

²⁰ Johnson (1987: 39-40) describes how the CONTAINER schema enters into our understanding of reasoning. He claims that we understand categories metaphorically as containers. The principle

Hierarchical structure is understood in terms of part-whole schemas and up-down schemas.

Linear quantity scales are understood in terms of up-down schemas and linear order schemas.” (Lakoff 1987: 283)

Abstract thought is structured by means of image schemas, which are grounded in everyday physical experience. In other words, abstract thought has a bodily basis:

“ 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. It is this that allows us to base a theory of meaning and rationality on aspects of bodily functioning.” (Lakoff 1987: 278)

The Invariance Hypothesis determines how image-schematic structure is preserved in abstract domains.

“ In metaphoric mapping, for those components of the source and target domains determined to be involved in the mapping, preserve the image-schematic structure of the target, and import as much image-schematic structure from the source as is consistent with that preservation.” (Turner 1993: 302)

3.2.5 Conclusions

In Section 3.2, I have demonstrated that image schemas are semantic structures that encapsulate the most basic elements of human experience. According to the Invariance Hypothesis (Lakoff 1990; Turner 1993), image schemas represent the information applied to a target domain by metaphoric language. Hence, image schemas are patterns which underlie experience, literal language and figurative expressions.

"Either P or non-P" (Law of the Excluded Middle) has an intuitive basis in our daily experience with CONTAINMENT. This principle holds, however, for the formal logic of metaphorical containers.

A second logical relation that is experientially motivated by CONTAINMENT is "transitivity". Our experience with containers and bounded spaces and their properties is the basis for our understanding of the transitivity of set membership. Sets are understood as containers for their members and their subsets.

A third point about logical structure that appears to be tied to the CONTAINMENT schema concerns the nature of negation. We understand our experience as broken into categories (of objects, events, states, properties, and relations). We understand those categories as abstract containers so that whatever is within the category is in the appropriate container. Thus, a negation of some type is a category of experience which is understood as characterising what is outside the container.

3.3 Evidence for the reality of image schemas

3.3.1 Introduction

In Section 3.3 of the current chapter, I will provide evidence from Psycholinguistics, Cognitive and Developmental Psychology for the cognitive reality of image schemas and their transformations.

3.3.2 Psycholinguistics

Gibbs et al. (1994) attempted to experimentally show that different senses of the polysemous word *stand* are motivated by different image schemas that arise from our bodily experience of standing. This psycholinguistic research has demonstrated that people make sense of different uses of *stand* because of their tacit understanding of several image schemas that arise partly from the ordinary bodily experience of standing. Those image schemas not only produce the grounding for many physical senses of *stand*, but also underlie people's understanding of complex, metaphorical uses. People perceive different senses of *stand* as similar partly on the basis of the underlying image-schematic profile for each use of the word in context.

3.3.3 Cognitive Psychology

The possible relevance of Cognitive Psychology research to image schemas was first noted by Johnson (1987) and Lakoff (1987). They both described several studies on mental imagery that supported the idea that image schemas and their transformations play an important role in cognitive functioning.

One topic that may be especially relevant to image schemas and their transformations is the connection between imagery and perception. Gibbs et al. (1994, 1995) provide support for image schemas in that people seem able to access certain modes of cognition, either recall of verbal information or visual imagery, through multiple channels, such as kinaesthetic and verbal report.

Also classic studies in mental rotation of images provide evidence for image schemas and their transformations. We are constrained in our mental processes of manipulating things similarly to how we are constrained in our physical ability to manipulate things in the real world (Gibbs et al. 1995).

Johnson concludes that

"[...] we can perform mental operations on image schemas that are analogs of spatial operations." (Johnson 1987: 25)

3.3.4 Developmental Psychology

There exists a body of evidence that Developmental Psychology provides on the primacy of the concept of CONTAINMENT, which underlies the meaning of the preposition *in*. CONTAINMENT is quite relevant to preverbal thinking and is an early part of conceptual development.²¹ Infants appear to have a concept of containers as places where things disappear and appear (Vandeloise 1991). Image schemas may explain some of those data.

The CONTAINMENT schema has three structural elements, namely, the interior, the boundary and the exterior, which primarily arise from two sources:

- perceptual analysis of the differentiation of figure from ground, that is, seeing objects as bounded and having an inside that is separate from the outside;
- perceptual analysis of objects going into and out of containers (Gibbs et al. 1995).

Let us consider briefly the image-schematic structure emerging from our experience of physical CONTAINMENT (Section 4.3.4).

Our encounter with CONTAINMENT and BOUNDEDNESS is one of the most pervasive features of our bodily experience (Section 4.4.2.4). We are intimately aware of our bodies as three-dimensional containers into which we put certain things (food, water, air), and out of which other things emerge (food and water wastes, blood, air). From the beginning, we experience constant physical CONTAINMENT in our surroundings (those things that envelop us). We move in and out of rooms, clothes, vehicles, and numerous kinds of bounded spaces. We manipulate objects placing them in containers (cups, boxes, bags). In each of those cases, there are repeatable spatial and temporal organisations. In other words, there are typical schemas for physical CONTAINMENT.

If we look for common structure in our many experiences of being in something, or for locating something within another thing, we find recurring

²¹ Vandeloise (1991) presents an extensive discussion on the child's acquisition of spatial prepositions *in*, *on* and *under*. The preposition *in* has been experimentally proved to be acquired before *on* and *under* (Clark 1973). The primacy of *in* in child's language acquisition seems to emerge from the primacy of the functional relation of CONTAINMENT. Those findings tacitly prove the advantage of the functional approach to the meaning of concepts as opposed to geometric or topological analyses. Developmental Psychology also provides some insight into the nature of prototypical containers. As containers with upward opening elicited better responses than

organisation of structures: the experiential basis for IN-OUT orientation is that of spatial BOUNDEDNESS. The most experientially salient sense of BOUNDEDNESS seems to be that of three-dimensional CONTAINMENT. If we eliminate one or two of those dimensions, we get equally important two- or one-dimensional CONTAINMENT.²² In those latter cases, however, the relevant experience is chiefly one of differentiation and separation, such as when a point lies in a circle or in a line segment. Physical IN-OUT orientation involves separation, differentiation and enclosure which implies restriction and limitation.

There are thus at least five important entailments, or consequences, of those recurring experiential image-schematic structures for IN-OUT orientation:

1. the experience of CONTAINMENT typically involves protection from or resistance to external forces;
2. CONTAINMENT also limits and restricts forces within the container; because of this restraint of forces, the contained object gets a relative fixity of location;
3. this relative fixing of location within the container means that the contained object becomes either accessible or inaccessible to the view of some observer. It is either held so that it can be observed, or else the container itself blocks or hides the objects from view;
4. finally, we experience transitivity of CONTAINMENT, if B is in A whatever is in B is also in A.

These are the implications of the internal structure of the CONTAINMENT image schemas. I do not insist that there must be only one central schema that covers all cases of the meaning of *in* used for physical CONTAINMENT. Rather, there are a small number of related schematic structures that emerge from our constant encounters with physical CONTAINMENT (Section 4.3.4). What is important is that those recurrent patterns are relatively small in number, they are nonpropositional, and yet, they have a sufficient internal structure to generate entailments and constrain inferences.

Another important conclusion is the role of our body in the CONTAINER schema (Section 2.2.4). It is believed that our sense of IN-OUT orientation is most intimately tied to our experience of our own bodily orientation: the body can be

containers with an opening on the side, the first category is more likely to constitute the prototype (Section 4.3.6.2.3).

²² Developmental Psychology research gives primacy to the CONTAINMENT schema involving three-dimensional entities (Clark 1973).

both the container and the thing contained. Most importantly, IN-OUT image schemas emerge first in our bodily experience, in our perception and movement.²³

Another aspect that seems to be involved in an early concept of CONTAINMENT is that of SUPPORT. True containers not only envelop things but support them as well. Infants are surprised when containers without bottoms appear to hold things (Vandeloise 1991). Similarly, infants could judge whether a block could be supported by a box open at the top only when they were able to compare the widths of the block and the box in a single glance as the one was lowered into the other. Those findings suggest that the notions of CONTAINMENT and SUPPORT may be closely related from an early age.

An infant's understanding of opening and closing is also related to the development of the concept of CONTAINMENT (Gibbs et al. 1995).

3.3.5 Conclusions

Image schemas organise our bodily and perceptual experiences into coherent meaningful patterns. They represent the base knowledge and underlie the physical senses of the word. The senses of a polysemous word are assumed to be linked to the underlying embodied image-schematic knowledge in a radial category structure (Section 2.3.6.1). The abstract senses are extended from the more central, physical senses. The senses are related through different linking mechanisms, such as image-schematic transformations, metonymic extensions, and metaphorical instantiations (Section 2.3.6.3). The intensive links between cognitively distinct image schemas explain why different image schemas all happen to motivate the senses of one lexical item. Moreover, due to the intensive links between image schemas, identification of the dominant one for a particular sense of the word is usually only a matter of emphasis

The idea that different senses of *in* are instantiations of the same image schemas explains why different senses of *in* are perceived as related by speakers and make sense in the way they do (Section 3.4).

²³ Although Johnson (1987) emphasises bodily experience as the basis of the understanding of CONTAINMENT, it is not obvious that bodily experience per se is required for perceptual analysis to take place. Indeed, it might be easier to analyse the sight of milk going in and out of a cup than milk going into or out of one's mouth (Gibbs et al. 1995).

3.4 Experiments

3.4.1 Introduction

The purpose of Section 4.3 of the current chapter is to present the category structure of the English preposition *in*. The three senses comprising the 56 uses of *in* will be revealed on the basis of the image-schematic approach discussed in Section 3.3. Emphasis will be laid on various links between image schemas, which result in image-schematic transformations leading to sense extensions and elaborations (Section 3.4.3.1).

Cognitive linguists and philosophers proposed the image-schematic approach to meaning and described various ways in which image schemas motivate sense extensions and sense relations in polysemous words (Section 2.4.3.2). The question that cognitive psychologists and psycholinguists address is to what extent the embodied image schemas and the image-schematic motivation of senses are psychologically real.²⁴

One way to test the hypothesis of the image-schematic basis of sense relations is to investigate whether people have some tacit understanding of relations between image schemas and various senses of a polysemous word, and whether this tacit knowledge can be used to predict the judgements of conceptual similarity for various senses of the polysemous word.

Chapter Three of this thesis offers such an empirical test of the image-schematic basis of relations between various senses of the polysemous spatial preposition *in*. It investigates whether people tacitly recognise connections between image schemas relevant to the bodily experience of the relationship *in* and various senses of the word *in*, including abstract and metaphorical senses, and examines whether this tacit knowledge can be used to predict people's judgements of conceptual similarity for various senses of *in*. This work does not claim that image schemas play a role in people's on-line production and understanding of word meaning. It only suggests, in the experimental part, that the embodied image-schematic knowledge motivates speakers' use and understanding of why various senses of a polysemous word such as *in* mean what they do.

²⁴ Psychological evidence is important for two reasons. First, cognitive linguists, following the "cognitive commitment" to construct theories that are consistent with what is known about the mind and brain, should be aware of the experimental findings from neighbouring disciplines, especially data that bear on the possible connections between perception, thought, and language. Second, experiments minimise the uncertainty in making personal inferences about thought and behaviour in whole populations of people.

Having investigated the basis of sense relatedness in the polysemous word *in*, I will address the issues of sense motivation and sense relatedness in Chapter Four of this thesis.²⁵

3.4.1.1 Description of the experiments

The study had the following plan. First, several image schemas relevant to the bodily experience of *in* were identified (Experiment 1). Second, the 56 uses of *in* were sorted into categories according to similarity of meaning (Experiment 2). Finally, the image-schematic profiles of those 56 uses were obtained (Experiment 3). The three experiments were adapted from Gibbs et al. (1994).

The purpose of Experiment 1 was to identify several major schemas that are relevant to the bodily experience of *in*. The important point was to identify the embodied image schemas. To achieve this goal the participants, twelve undergraduate students from the University of Glasgow, were gathered in a large empty room. They were tested in three groups of four people each. During the experiment the door remained closed. The participants were asked to move around the room, jump and touch the walls, to get a sense of what it meant to be in a room. Afterwards, the participants were read the descriptions of 12 image schemas, one at a time, and asked to evaluate how appropriate each image schema was to their experience of being in a room on the scale of 1 to 7 with 1 meaning "not at all appropriate" and 7 meaning "very appropriate". The order of image schemas was counterbalanced across the participants. The 12 image schemas were selected in part on the basis of Vandeloise's (1991) analysis of FORCE and perceptual relations involved in French spatial prepositions, such as SUPPORT, VISIBILITY and CONTROL, and from Johnson's (1987) list of 27 important image schemas structuring people's every day reasoning and imagination, such as CONTAINER and PATH (Section 3.2.3). Some image schemas (such as CONTAINER) were expected to be very important to the preconceptual experience connected with the preposition *in*, whereas other image schemas (such as LINK) were expected to be far less important to the bodily experience of *in*.²⁶

²⁵ Brugman (1981), Vandeloise (1991) and Cuyckens (1993) have examined how image schemas represent the underlying meaning that relates the seemingly disparate senses of prepositions. The image-schematic structure motivates verb-particle constructions (Lindner 1982), as well as explains the many kinds of cognitive relationships that can form the basis of the extension of a category, such as Japanese *hon* (Lakoff 1987). More recent investigations from linguistics and philosophy examined the role that image schemas have in motivating abstract and metaphorical concepts, such as causation, death and morality (Lakoff and Turner 1989).

experience connected with the preposition *in*, whereas other image schemas (such as LINK) were expected to be far less important to the bodily experience of *in*.²⁶ On the basis of the participants' ratings, seven image schemas, most relevant to the bodily experience of *in*, were identified (Section 3.4.2.1).

Experiment 2 was designed to obtain judgements of similarity for different physical and non-physical uses of *in*. The participants, 12 undergraduate students from the University of Glasgow who did not participate in Experiment 1, were to sort 56 different uses of *in* into three groups according to the similarity of meaning. I considered it important that the number of groups should be limited if analysable results were to be obtained. The 56 sentences with the preposition *in* were printed on slips of paper, one use per slip. The examples were selected from the Oxford English Dictionary and previous analyses of English spatial prepositions (Herkovits 1986; Vandeloise 1984, 1991; Cuyckens 1993). I specifically attempted to obtain a wide range of uses for *in*, with special emphasis on the fact that a sufficient variety of spatial uses of the preposition were included in the list of examples.

Spatial uses are claimed to motivate metaphoric extensions (Section 1.2). Therefore a plethora of spatial instantiations of *in* is likely to motivate a large number of metaphoric ones, thus proving an assumption that the range of meanings of polysemous items is to be explained in terms of image schemas as well as their metonymic and metaphoric extensions (Section 2.3.6). My hypothesis was that the uses of *in* that would be similar in meaning and grouped together in Experiment 2 would have similar image-schematic structure. The image-schematic profiles for the 56 uses of *in* were to be obtained independently in Experiment 3. The aim of Experiment 2 was simply to obtain the groups of conceptually similar uses of *in*. However, I do not claim that those 56 examples represent entirely different senses nor do they reflect all aspects of how *in* is used in contemporary English.

The purpose of Experiment 3 was to obtain image-schematic profiles for the 56 uses of *in*. The assumption was that the groupings of conceptually similar senses

²⁶ It is important to note that image schemas, being embodied preconceptual meaning structures, are not necessarily consciously represented or activated during on-line language processing. Even though they motivate various abstract concepts, they themselves are not necessarily the semantic representations of those concepts. For example, the image schema CONTAINER can motivate various concepts. However, the CONTAINER image schema itself is on the level of preconceptual bodily meaning, which is not necessarily semantically represented.

obtained in Experiment 2 could be predicted on the basis of image-schematic profiles for those uses obtained in Experiment 3.

The subjects for Experiment 3 were ten members of staff at Glasgow University, from the Department of Slavonic Languages. They were all native speakers of English with some expertise in linguistics. Each of the subjects was provided with a list of the 56 uses of the preposition *in*. They were also each given a list of image schemas relevant for the bodily experience of *in*: CONTAINER, PART-WHOLE, MERGING, PATH, CONSTRAINT, PRESSURE, SUPPORT. An additional list of five schemas, CONTROL, CONTACT, INVISIBILITY, FULL-EMPTY, CENTRE-PERIPHERY, was provided in case the subjects felt it impossible to define the meaning of an example by limiting themselves to the most relevant seven image schemas. It was strongly indicated though that responses should be focused on the first seven image schemas. The subjects' task was to decide which image schema most appropriately reflected the meaning of each individual use of *in*. In other words, they were to place the name of an appropriate image schema next to each use of the preposition. They were given one week in which to complete the task. Although the subjects were requested to limit their image-schematic profiles to the most central schema only, it was assumed that more than one image schema would be provided in some cases. The assumption was based on the fact that most of the participants found the task extremely difficult. They had problems with understanding the definitions of the schemas (Section 3.4.2). Moreover, the participants, in some cases, could not see the correlation between the schemas and a specific use of the preposition. Abstract examples seemed to cause most problems.

Nevertheless, the underlying hypothesis was that central examples of a given image-schematic profile would not need additional refinements and would thus be described by one image schema only. Non-central cases, on the other hand, were predicted to have profiles involving many image schemas. However, multi-schematic profiles were assumed to be assigned in a way that made group membership clear in most cases.

3.4.2 Experiment One

The descriptions of all 12 image schemas employed in Experiment 1 are presented in Table 1 below.

CONTAINER - refers to you being bounded and enclosed while you are in the room. Do you feel a sense of **CONTAINER** while you are in the room?

FULL-EMPTY - refers to your experience of some physical or mental entity being filled or emptied while you are in the room. Do you feel a sense of **FULL-EMPTY** while you are in the room?

SUPPORT - refers to the sense of you being supported by the room while you are in it. Do you feel a sense of **SUPPORT** while you are in the room?

PATH - refers to the sense of you moving along some course while you are in the room. Do you feel a sense of **PATH** while you are in the room?

CONTROL - refers to the sense of you being controlled by the room while you are in it. Do you feel a sense of **CONTROL** while you are in the room?

INVISIBILITY - refers to the sense of you being invisible while you are in the room. Do you feel a sense of **INVISIBILITY** while you are in the room?

MERGING - refers to your sense that you and the room are becoming one entity while you are in it. Do you feel a sense of **MERGING** while you are in the room?

PRESSURE - refers to your sense of exerting some pressure on the room while you are in it. Do you feel a sense of **PRESSURE** while you are in the room?

CONSTRAINT - refers to your sense of being unable to perform certain movements while being in the room. Do you feel a sense of **CONSTRAINT** while you are in the room?

CENTRE-PERIPHERY - refers to you being in the centre and the room being in the background while you are in it. Do you feel a sense of **CENTRE-PERIPHERY** while you are in the room?

CONTACT - refers to your sense of having some physical contact with the room while you are in it. Do you feel a sense of **CONTACT** while you are in the room?

PART-WHOLE - refers to your sense of being part of the room while you are in it. Do you feel a sense of **PART-WHOLE** while you are in the room?

Table 1. Descriptions of 12 image schemas in Experiment 1

3.4.2.1 Results and Discussion

The mean ratings of appropriateness of 12 image schemas relevant to the bodily experience of *in* are presented in Table 2 below.

Image schema	Rating (1- 7)
CONTAINER	6.43
PATH	6.30
MERGING	6.18
PART-WHOLE	6.02
CONSTRAINT	5.67
PRESSURE	4.80
SUPPORT	3.86
FULL-EMPTY	3.56
CONTACT	2.36
CONTROL	1.77
INVISIBILITY	1.60
CENTRE- PERIPHERY	1.24

Table 2. Mean ratings of appropriateness of 12 image schemas relevant to the bodily experience of *in*

The results obtained show that five image schemas are the most important to the bodily experience of *in*. These are: CONTAINER, PATH, MERGING, PART-WHOLE and CONSTRAINT. The results of the semantic analysis will demonstrate the relevance of the FULL-EMPTY schema for the CONTAINER gestalt (Sections 4.3.6-4.3.8). Therefore, the schema will be included in the current section.²⁷

The strong hypothesis underlying the study is that there are some correlations between image schemas (Section 3.2.3). Thus, I perceive the following correspondences between the six image schemas enumerated above:

²⁷ The schemas for CONSTRAINT, PRESSURE and SUPPORT are subsumed under the FORCE gestalt (Johnson 1987).

- links between the CONTAINER schema and the FORCE schema. Johnson (1987) notes the relevance of inside and outside forces acting upon the contained entity (Section 3.3.4);
- links between the CONTAINER schema and the PATH schema. The contained object moves (is moved) along a path. Besides, the contained entity can move inside the container;
- links between the CONTAINER schema and the PART-WHOLE schema. The correlation has the following experiential basis: forces acting on the contents of the container can increase their magnitude to such an extent as to incorporate the distinct contained entity within the containing entity;
- links between the CONTAINER schema and the FULL-EMPTY schema. The correlation is experientially motivated by the fact that containers can be filled (Section 4.2.3.1.3);
- a transition between the PART-WHOLE schema and the MERGING schema. The experiential basis consists in the fact that the entities constituting parts and wholes respectively are similar in nature. The perceived similarity can reach the level at which we are no longer able to distinguish parts within the whole. Thus, parts have merged to compose a whole. The increased degree of forceful interactions facilitates the process;
- links between the FULL-EMPTY schema and the PATH schema based on the fact that the action of filling a container is conceptualised along a vertical PATH schema;
- links between the schemas for SUPPORT, CONSTRAINT, and PRESSURE based on the superordinate schema for FORCE (Johnson 1987).

Many of the relations between image schemas enumerated above presuppose others. For instance, if the PATH schema is related to the CONTAINER schema it is at the same time correlated with the FORCE schema. I assume that such inferences are clear enough and do not require elaboration. The reality of those correlations will be experientially demonstrated in Section 3.4.4.1.

Consequently, it is postulated that image schemas relevant to the preconceptual experience of *in* be defined as follows:

1. CONTAINER

The CONTAINER schema consists of the inside, the boundaries and the outside (Section 3.3.4). Lakoff (1990) claims that the CONTAINER schema has the

following cognitive inference structure. The containing entity exerts control over the contained object. The control is to be understood as the trajector being unable to exit the container. The more boundaries the containing landmark possesses and the denser its internal structure, the more difficult it is for the trajector to become separated from the landmark.

2. PATH

The PATH image schema consists of the starting point, the trajectory and the end point. The schema lends itself to a PATH-FOCUS TO END-POINT FOCUS transformation (Section 3.2.3). It presupposes the vector of (potential) movement (Section 2.2.5).

3. PART-WHOLE to MERGING

The image schema has the following characteristics

- the whole acts as a background for its parts;
- the parts are typically more salient than the whole;
- if the process evolves towards MERGING, it is difficult to distinguish the components of the schema (Section 4.2.3.2.1);

4. FORCE

Johnson (1987) distinguishes the following features of the schema for FORCE:

- interaction,
- directionality (a vector quality of FORCE),
- a single path of motion, which is tied up with the vector quality of forceful movement,
- origins and sources of FORCES,
- degrees of power or intensity of FORCE.

The following image schemas for FORCE can be further distinguished:

1. COMPULSION (PRESSURE),
2. BLOCKAGE,
3. COUNTERFORCE,
4. DIVERSION,
5. REMOVAL OF RESTRAINT,
6. ENABLEMENT,
7. ATTRACTION.

5. FULL-EMPTY

The schema is defined along the PATH schema. The degree to which a container is filled corresponds to the position of the filling entity on the vertical axis.

The image schemas and relations between them revealed in Experiment 1 above constitute the structure underlying the meaning of the English preposition *in* (Section 4.3.4).

3.4.3 Experiment Two

The 56 uses of *in* employed in Experiment 2 are presented in Table 3 below.

1. WE ARE IN SCOTLAND.
2. HE IS IN BED.
3. MARY IS IN HER TWENTIES.
4. HE IS DEAF IN ONE EAR.
5. HE REFUSED TO SAY ANYTHING IN REPLY TO THE QUESTION.
6. HE WAS SHOT IN THE HEAD.
7. DO YOU RECOGNISE THAT MAN IN JEANS?
8. ONE IN TEN PEOPLE HAD PROBLEMS WITH READING.
9. THE CIRCLE IS DRAWN IN A TRIANGLE.
10. WE ARE LEAVING IN APRIL.
11. WHO IS THE WOMAN IN THAT PAINTING?
12. I HAVE GOT SOMETHING IN MY EYE.
13. THERE IS A WARDROBE IN THE CORNER.
14. HE IS DOING A DEGREE IN PHILOSOPHY.
15. PUT THE BUTTER IN THE FRIDGE.
16. THE BRAIN IS IN THE HEAD.
17. THE MAGAZINE IS IN THE RACK.
18. THERE IS A HOLE IN THE ROAD.
19. THE MONUMENT IS IN GRANITE.
20. THE SUN IS IN MY FACE.
21. HE IS IN THE BEDROOM.
22. I GOT STUCK IN A TRAFFIC JAM.

23. GET IN THE CAR.
24. THEY LIVE IN THE MIDDLE OF THE WOOD.
25. THE HOUSE IS IN RUINS.
26. SHE IS IN THE NEWS.
27. THE PAINT IS IN THE JAR.
28. THERE IS A PAIN IN MY BACK.
29. JERSEY IS IN THE ENGLISH CHANNEL.
30. THE SNAKE IS IN THE GRASS.
31. THERE IS A STONE IN MY HAND.
32. THERE IS A GOLD THREAD IN THE CARPET.
33. THE SQUIRREL IS IN THE TREE.
34. IN REFUSING TO GO ABROAD, HE MISSED HIS CHANCE.
35. THERE ARE TOYS IN THE WINDOW.
36. SLICE THE POTATOES IN TWO.
37. WE WATCHED THE SCENE IN HORROR.
38. HAVE YOU EVER BEEN IN LOVE?
39. YOUR CAR IS IN VERY GOOD CONDITION.
40. THE SOCKET IS IN THE WALL.
41. HE SPOKE IN RUSSIAN.
42. I HAVE BEEN WAITING IN THIS QUEUE FOR AGES.
43. THE NAILS ARE IN THE BOARD.
44. THE DIP IN THE GRAPH IS VERY SIGNIFICANT.
45. HE LIVES IN OUR NEIGHBOURHOOD.
46. THE CAMEL IS IN THE DESERT.
47. THERE IS A CURVE IN THE ROAD.
48. SHE TAKES MILK IN HER COFFEE.
49. MY FOOT IS IN THE STIRRUP.
50. HE WAS STANDING IN THE DOORWAY.
51. FISH SWIM IN THE WATER.
52. SHE HAS GOT A CHILD IN HER ARMS.
53. HE HAS GOT A RING IN HIS EAR.

54. THE KETTLE HANGS IN THE FIRE.
 55. THE GOLD IS IN THE ORE.
 56. DINNER WILL BE READY IN TEN MINUTES.

Table 3. The 56 uses of the English preposition *in*

3.4.3.1 Results and Discussion

Three groups of senses were identified for the preposition *in*. Group membership was established on the basis of the frequency of occurrence. The numbers placed next to each example show how often a given item occurred in a particular group. The limits of a group were established on the basis of “anchoring examples”. These were the instances which always or in most cases occurred in each of the respective groups. They are placed at the top of each list of senses in Table 4 below.

GROUP ONE	GROUP TWO
1. The brain is in the head. 12	1. There is a curve in the road. 4
2. He is in the bedroom. 12	2. Fish swim in the water. 4
3. The paint is in the jar. 12	3. There is a gold thread in the carpet. 4
4. The squirrel is in the tree. 12	4. She takes milk in her coffee. 4
5. There is a wardrobe in the corner. 10	5. He is deaf in one ear. 4
6. The snake is in the grass. 10	6. The gold is in the ore. 4
7. She has got a child in her arms. 10	7. She is in the news.
8. There are toys in the window. 10	8. Who is that woman in the painting? 3
9. I have been waiting in this queue for ages. 10	9. Do you recognise that man in jeans? 3
10. They live in the middle of the wood. 10	10. He lives in our neighbourhood. 3
11. The camel is in the desert. 10	
12. The dip in the graph is very significant. 10	
13. The socket is in the wall. 10	
14. The nails are in the board. 10	GROUP THREE
15. He has got a ring in his ear. 8	1. He spoke in Russian. 10
16. We are in Scotland. 8	2. He is doing a degree in philosophy. 10
17. He is in bed. 8	3. Dinner will be ready in ten minutes. 10
18. I have got something in my eye. 8	4. Mary is in her twenties. 8

19. The magazine is in the rack. 7	5. In refusing to go abroad, he missed his chance. 8
20. The circle is drawn in a triangle. 7	6. Your car is in very good condition. 8
21. Jersey is in the English Channel. 7	7. We are leaving in April. 7
22. There is a pain in my back. 7	8. The house is in ruins. 7
23. There is a hole in the road. 7	9. The sun is in my face. 7
24. We watched the scene in horror. 6	10. He refused to say anything in reply to the question. 6
25. Have you ever been in love? 6	11. He was shot in the head. 6
26. Get in the car. 5	12. The monument is in granite. 6
27. I got stuck in the traffic jam. 5	13. Slice the potatoes in two. 4
28. My foot is in the stirrup. 5	14. One in ten people had problems with reading. 4
29. Put the butter in the fridge. 5	
30. There is a stone in my hand. 5	
31. He was standing in the doorway. 5	
32. The kettle hangs in the fire. 5	

Table 4. The three groups of senses of the preposition *in*

On the basis of Experiment 2, I can suggest that the subjects perceived distinctions between the uses of *in* clear enough to sort the uses into three different senses. The groupings of the conceptually similar uses can be accounted for by means of complex embodied image schemas - an attempt to establish those schemas was undertaken in Experiment 1 above. This hypothesis will further be tested in Experiment 3 below.

Each set of examples is to be viewed as a category. Consequently, I assume that each group will feature central as well as peripheral members. Furthermore, I am of the opinion that the three groups of the uses of *in* are interconnected by means of family resemblances based on the links between the six image schemas (Section 3.4.2.1). I also maintain that the three categories of senses are subsumed under a more abstract CONTAINER schema (Section 4.3.4).

Group One contains the largest number of uses (32), which feature a great number of predominantly spatial configurations, among which the central ones can be recognised. These are:

1. The brain is in the head.
2. He is in the bedroom.
3. The paint is in the jar.
4. The squirrel is in the tree.

All twelve subjects classified those instances as members of Group One.

Group One shows a clear category structure. Ratings of the appropriateness of examples decrease from the centre (prototype) to reach the periphery of the category. The non-central members are:

27. Get in the car.
28. I got stuck in the traffic jam.
29. My foot is in the stirrup.
30. Put the butter in the fridge.
31. There is a stone in my hand.
32. He was standing in the doorway.

The marginal members of the category (Group One) were classified as good representatives of the set by only five subjects. The most marginal members of Group One are assumed to show a certain degree of overlap with members of the other two groups. In other words, I assume that their image-schematic profiles will overlap with the schemas for PATH and/or PART-WHOLE (Section 3.4.2.1).

Group One is assumed to feature the most configurationally varied and thus metaphorically productive set of uses. The configurational variation is assumed to concern instances of the same image schemas, which makes Group One the most central of the three (Section 4.3.6).

Group Two is composed of ten instances. The distinction between central and peripheral uses is blurred. The best example(s) scored 4 points while the poorest obtained 2 points. In other words, Group Two does not show a clear category structure. It is difficult to find the central (prototypical) member of this category. What can be thus inferred is that Group Two may not constitute an independent sense. Rather, it should be viewed as a transition group between Group One and Group Three. In other words, members of Group Two are non-central members of either Group One or Group Three. The existence of such a transition group is motivated by the continuum along which the image schemas underlying the conceptualisation of *in* are structured (Experiment One). Alternately, we can assume that there exist prototypical instances of Group Two which have been classified as peripheral members of one of the other two groups. The results of Experiment 3 below suggest that the latter is more plausible (Section 3.4.4.1).

Group Three contains 14 examples. The group shows a clear a category structure.

The best examples are:

1. He spoke in Russian.
2. He is doing a degree in philosophy.
3. Dinner will be ready in ten minutes.

Their level of appropriateness is 10 points.

The peripheral examples are:

13. Slice the potatoes in two.
14. One in ten people had problems with reading.

They were classified as good examples of the group by four subjects.

Consequently, they are likely to show featural overlap with the other two groups.

Group Three includes examples which seem to be the most unrelated. Thus, it is my tentative hypothesis that Group Three could be further divided to reveal the distinct image schemas for PATH and FORCE (Section 3.4.4.1).

3.4.4 Experiment Three

Table 5 below presents the sets of *in* examples distinguished on the basis of individual image-schematic profiles. Group headings were chosen on the basis of the prevailing image schema. The numbers placed next to each example indicate the frequency of co-occurrence of a particular example and a given image schema. Image schemas of secondary importance for a particular item are placed in brackets, along with the frequency of their occurrence.

IMAGE SCHEMA	EXAMPLES
CONTAINER	<ol style="list-style-type: none"> 1. He is in the bedroom. 10 2. The circle is drawn in a triangle. 10 3. The paint is in the jar. 10 4. There are toys in the window. 10 5. The brain is in the head. 10 6. We are in Scotland. (SUPPORT 2) 10 7. He is in bed. (SUPPORT 3) 9 8. The magazine is in the rack. (SUPPORT 3) 8 9. They live in the middle of the wood. 8 10. There is a stone in my hand. 8 11. Put the butter in the fridge. (PATH 4) 7 12. The nails are in the board. (PART-WHOLE 4) 7 13. The camel is in the desert. (PART-WHOLE 3) 7 14. He was standing in the doorway. 7 15. Fish swim in the water. 7 16. I have got something in my eye. (CONSTRAINT 5) 6 17. She has got a child in her arms. (SUPPORT5) 6 18. My foot is in the stirrup. (FULL-EMPTY 2) 6 19. There is a hole in the road. (FULL-EMPTY 3) 6 20. Who is the woman in that painting? (PART-WHOLE 5) 5 21. Do you recognise that man in jeans? (PART-WHOLE 5) 5 22. Jersey is in the English Channel. (PART-WHOLE 2) 5 23. He lives in our neighbourhood. (PART-WHOLE 3) 5 24. There is a wardrobe in the corner. 5 25. The snake is in the grass. 5 26. The squirrel is in the tree. (MERGING 3) 5 27. The socket is in the wall. (PART-WHOLE 3) 5 28. Have you ever been in love? (CONSTRAINT 4) 4 29. Your car is in very good condition. (FULL-EMPTY 2) 2

<p>PART-WHOLE</p>	<p>1. One in ten people had problems with reading. 10 2. I have been waiting in this queue for ages. (CONTAINER 4) 8 3. She is in the news. (CONTAINER 5) 7 4. There is a gold thread in the carpet. (CONTAINER 4) 7 5. He is deaf in one ear. (CONTAINER 6) 7 6. She takes milk in her coffee. (CONTAINER 3) 7 7. The gold is in the ore. (CONTAINER 3) 6 8. There is a curve in the road. 6 9. He was shot in the head. (PATH 3) 6 10. He has got a ring in his ear. 6 11. Slice the potatoes in two. 5 12. The kettle hangs in the fire. (CONTAINER 3) 3</p>
<p>FORCE: CONSTRAINT</p>	<p>1. I got stuck in a traffic jam. (CONTAINER 6) 9 2. In refusing to go abroad, he missed his chance. 7 3. He refused to say anything in reply to the question. 6 4. There is a pain in my back. 6 5. We watched the scene in horror. 5 6. The sun is in my face. (MERGING 4) 3</p>
<p>MERGING</p>	<p>1. The monument is in granite. (FULL-EMPTY 4) 9</p>
<p>FULL-EMPTY</p>	<p>1. The house is in ruins. 9 (PATH 2)</p>
<p>PATH</p>	<p>1. Get in the car. (CONTAINER 8) 10 2. He is doing a degree in philosophy. 9 3. Mary is in her twenties. (CONTAINER 4) 7 4. Dinner will be ready in ten minutes. 7 5. We are leaving in April. 6 6. The dip in the graph is very significant. (PART-WHOLE 2) 5 7. He spoke in Russian. (CONTAINER 3) 4</p>

Table 5. Groups of *in* examples established on the basis of image-schematic profiles

3.4.4.1 Results and Discussion

Subjects considered it a meaningful task to represent their meaning intuitions of the 56 *in* examples in terms of image schemas. In other words, their judgements may attest to the fact that there exists an underlying image-schematic structure giving coherence to our experience at the preconceptual level, which is in turn manifested by the conceptual structure of the category. Consequently, the image-schematic profiles obtained in Experiment 3 for the 56 uses of *in* may well indicate what preconceptual information is present in the semantic structure of the preposition *in*.

On the basis of the results of Experiment 3, it appears that six image schemas, CONTAINER, PART-WHOLE, MERGING, CONSTRAINT, PATH and FULL-EMPTY, were attributed enough salience by the subjects to be rendered the determinants of groups of senses. In comparison with Experiments 1 and 2 above, a few interesting points can be observed.

Out of the schemas for FORCE, the CONSTRAINT schema seems to be the most salient. The category includes six examples and features a clear prototype:

1. I got stuck in a traffic jam.

The schema for SUPPORT was not found salient enough to underlie a separate category of uses the schema was typically viewed as one of the dimensions of the CONTAINER schema (examples: 6, 7, 8,17).

The schema for PRESSURE did not occur among the results of Experiment 3.

The FULL-EMPTY schema, which was not enumerated among the five schemas relevant to the preconceptual experience of *in* in Experiment 1, was evaluated as a determinant of an image-schematic profile.

The MERGING schema, as well as the FULL-EMPTY schema, form, according to the results of Experiment 3, categories which include only one example each. The schemas might underlie separate categories of senses provided the number of *in* instances included in the experiment was larger. Alternatively, they can be viewed as subschemas of other categories based on complex experiential gestalts (CONTAINER for the FULL-EMPTY schema, and PART-WHOLE for the MERGING schema). I assume that it is more linguistically economical to adopt the latter interpretation (Section 4.3.4).

Below, I discuss how the image-schematic profiles established for each of the uses of *in* in Experiment 3 predict group membership in Experiment 2.

3.4.4.1.1 CONTAINER

The first group of uses motivated by the CONTAINER schema is the most numerous and varied. It includes 29 examples which refer to both spatial and abstract domains. The category is centred around the most prototypical examples (1-6). Peripheral members of the category are assumed to show a considerable featural overlap with members of neighbouring categories (PART-WHOLE, FORCE, PATH).

Eleven examples are defined by the CONTAINER schema only. Moreover, those instances are very good members of the category (four of them belong to the prototypical set). Consequently, I suggest the dominant role of the CONTAINER schema in underlying the category structure of *in*.²⁸

Less prototypical members of the category defined by the CONTAINER schema feature more overlap with other schemas. These are: PART-WHOLE (7), SUPPORT (4), FULL-EMPTY (3), CONSTRAINT (2), PATH (1) and MERGING (1).

The co-occurrence of the CONTAINER schema with the six schemas enumerated above is motivated by experiential links perceived among image schemas and discussed in Section 3.4.2.1. Those links may well determine image-schematic transformations, sense connections, and metaphoric extensions (Section 4.2).

28 out of the 32 members of Group One, Experiment 2, can be predicted on the basis of image-schematic profiles established in Experiment 3. The exceptions are:

1. Fish swim in the water.
2. Who is the woman in that painting?
3. Do you recognise that man in jeans?
4. Your car is in very good condition.

Examples 1-4 above were motivated by the CONTAINER schema in Experiment 3. In Experiment 2, however, Examples 1-3 were classified as members of Group Two, Example 4 as an instantiation of Group Three. My suggestion for Experiment 2, Group Two was that this category, being not a very clearly delineated one, was likely to include peripheral members of Groups One and Three. Consequently, the relation between Group Two, Experiment 2 and the CONTAINER schema motivating membership in the first group of Experiment 3

can be suggested. The relation is reinforced by experiential co-relations between image schemas (Section 3.4.2.1).

There is an interesting correspondence between the most prototypical members of Group One, Experiment 2, and the group currently discussed in Experiment 3. The following examples were rendered the most central in both groups:

1. The brain is in the head.
2. He is in the bedroom.
3. The paint is in the jar.

Thus, it might be suggested that the three examples above form the prototype of the category *in* (Section 4.3.6.2.3).

3.4.4.1.2 PART-WHOLE

The second group distinguished in Experiment 3 is motivated by the PART-WHOLE schema. The image-schematic profiles attributed to each of the uses of *in* in the PART-WHOLE group can predict the membership in Group Two, Experiment 2 for six out of the ten members. This lower rate of predictability shows that the PART-WHOLE schema is less prototypical for the category structure of *in* than the CONTAINER schema.

The PART-WHOLE group of Experiment 3 features a clear category structure with distinct prototypical members:

1. One in ten people had problems with reading.
2. I have been waiting in this queue for ages.

Example 1 was placed at the periphery of Group Three, Experiment 2. Since peripheral members of one category are likely to overlap with members of other categories, it may be assumed that Example 1 above is the prototype of the PART-WHOLE group rather than a marginal member of the third group in Experiment 2 (Section 3.4.3.1). In this, more consistency is given to the PART-WHOLE group by providing the category with a clear prototype. At the same time, a better structure is given to Group Three, Experiment 3 in reducing the number of image schemas underlying the uses of *in* comprised by this category.

Example 2 above has been classified as a prototypical member of Group One, Experiment Two.

The PART-WHOLE schema is likely to motivate a distinct sense of the preposition *in*. Although the category is linked to that of the CONTAINER

²⁸ None of the other schemas (PART-WHOLE, PATH, and FORCE) was found to be the sole

schema (Section 3.4.2.1), it may well feature some overlap with the structure of other prepositions (Section 4.3.7).

3.4.4.1.3 MERGING and FULL-EMPTY

The MERGING schema underlying the meaning of:

1. The monument is in granite.

constitutes a separate category according to the subjects participating in Experiment 3. It is my assumption, though, that such a limited number of examples (1) is not likely to constitute a separate category. Rather, the MERGING schema should be placed on the continuum along with such relations as: SEPARATION, CONTAINMENT, and PART-WHOLE.

A similar conclusion can be drawn in the case of the FULL-EMPTY schema, which appears to motivate another one-member category:

1. The house is in ruins.

Although the FULL-EMPTY schema is relevant to the semantic structure of *in*, in being closely linked to the CONTAINER schema as well as motivating metaphorical extensions, I do not assume that it is salient enough to form a separate sense of the preposition (Section 3.4.4.1).

3.4.4.1.4 FORCE

Group Three is motivated by the FORCE schema. The CONSTRAINT gestalt dominates in all the six uses of *in* included in the category. The category manifests a clear internal structure, with one prototypical example:

1. I got stuck in a traffic jam.

In Section 3.4.2.1, the importance of the FORCE schema for the relation of CONTAINMENT was recognised.

Johnson (1987) describes the CONTAINER schema in terms of forces acting upon and inside the container (Section 3.3.4). Thus, I suggest that the CONSTRAINT schema be considered a prominent part of the CONTAINER gestalt rather than a separate category of the uses of *in* (Section 4.2.3.2.1).

3.4.4.1.5 PATH

The PATH schema underlies a category of seven uses of *in*. It features a clear prototype:

1. Get in the car.

The category structure is well-delineated, with a range of ratings from 10 to 4.

I assume that the PATH schema motivates a separate sense category of the preposition *in*. In other words, it features only some of the parameters of the CONTAINER gestalt (Section 4.3.4). Though experientially linked to the CONTAINER schema, the category may manifest a featural overlap with the structure of other prepositions (Section 4.3.8).

Image-schematic profiles for members of the two groups, FORCE and PATH, predict 11 out of the 16 uses in Group Three, Experiment 2.

On the whole, image-schematic profiles obtained in Experiment 3 for the 56 uses of the preposition *in* correctly predicted membership in the three groups of *in* uses in Experiment 2 in 44 out of the 56 cases.

3.4.5 Conclusions to experimental work

The theory of image schemas, presented in Section 3.2, provides a reliable means of accounting for the nature of polysemous items.

The results of the three experiments above suggest that image schemas give coherence to all human experience. Image-schematic structures underlie the experience of the relation *in* and image-schematic profiles may well predict groupings of examples in such a way as to form a category structure of the preposition *in*. Thus, image schemas are present at the preconceptual as well as semantic level of the description of *in*.

The structure of the category *in* seems to be motivated by the following image schemas: CONTAINER, PART-WHOLE, MERGING, PRESSURE, CONSTRAINT and PATH

(Experiment 1). With the exception of the FULL-EMPTY schema, the image schemas applied by subjects in Experiment 3 were consistent with those obtained in Experiment 1.

The CONTAINER schema appears the most central among the three categories of senses constituting the meaning structure of *in*. The following results are of special importance:

- in Experiment 2 as well as Experiment 3, the groups of senses motivated by the CONTAINER schema are the largest and most configurationally varied. Thus, the CONTAINER schema may be assumed to be the most linguistically productive for concrete as well as abstract senses of *in*;
- both experiments demonstrate that the CONTAINER schema is the most salient as it alone underlies over 30% of all the uses of *in* in the first group of Experiment 3, four of which are prototypical examples. The role of the CONTAINER schema for the category structure of *in* was also confirmed by the results of Experiment 1 above.

The experiential gestalt for CONTAINER shows an overlap with six image schemas relevant to the understanding of *in*, which further confirms the central role of the CONTAINER schema for the meaning of *in* (Section 3.4.2.1). The centrality of CONTAINMENT should be viewed at the superordinate as well as basic level of categorisation.²⁹

²⁹ In other words, I suggest that the superordinate schema for CONTAINMENT subsume the three presumed senses of *in*. At the basic level of categorisation, the schema for CONTAINER will co-exist with the schemas for PART-WHOLE and PATH.

There are relations between schemas that allow us to view some of them along a continuum (CONTAINER, PART-WHOLE, MERGING) or as dimensions of complex gestalts (Section 3.4.2.1). Those relations may motivate metaphorical and metonymic meaning extensions.

The relations among the 56 uses of *in* emerging as a result of Experiment 3 form the basis of the category structure of the preposition *in* discussed in detail in Chapter Four.

3.5 Summary of Chapter Three

The purpose of Chapter Three was to experimentally investigate and describe the principles according to which different uses of the polysemous spatial preposition *in* are related to each other. The main conclusion from the experimental work is that people tacitly recognise some connection between schematic bodily experiences and different aspects of linguistic meaning, including meanings that are highly abstract. This work obtained evidence that may support the image-schematic approach to polysemy (Section 3.2).

According to this approach, different uses of an individual polysemous word are related on the basis of the embodied image schemas and different types of cognitive links, including image-schematic transformations, metonymic relations, and image-schematic metaphorical instantiations.

My hypothesis was that four major embodied image schemas relevant to the bodily experience of *in*, CONTAINER, PART-WHOLE, FORCE and PATH, could significantly account for the relations between different senses of *in*. The results of the experiments supported this hypothesis. It was found that membership in the groupings of conceptually similar senses of *in* could be reliably predicted on the basis of the image-schematic profiles of those senses, independently obtained in another experiment.

The experimental evidence supported the complex image-schematic approach to the polysemy of *in*. The participants had clear intuitions about the relative importance of different image schemas to the senses of *in*. Based on the participants' judgements, different senses of *in* acquired different complex image-schematic profiles. For example, the image schema of CONTAINER was judged to be the most important in the image-schematic profile of :

1. He is in the bedroom.
2. The paint is in the jar.
3. The brain is in the head.

PATH was rated as the most important schema in the image-schematic profile of:

1. Get in the car.

Overall results suggest that an adequate account of polysemy requires embodied image schemas that are rooted in people's force experiences and perceptual interactions in the world (Section 3.4.4.1.4).

One of the important properties of an image schema is that it can be metaphorically instantiated in different domains (Section 3.2.4). According to the Invariance Hypothesis, the metaphorical mappings preserve the cognitive topology (that is, the image-schematic structure) of the source domain (Lakoff 1990:54). The experimental results seem to have supported the Hypothesis. For example, the image schema CONTAINER was judged to be the dominant image schema for such different physical and metaphorical senses of *in* as *The paint is in the jar*, *Have you ever been in love?*, *Your car is in very good condition*. The schema for FORCE may well underlie the preposition in *The sun is in my face* and *In refusing to go abroad, he missed his chance*.

The fact that in one experiment those different senses of *in* acquired similar image-schematic profiles with CONTAINER and FORCE respectively being a dominant image schema, while in another independent experiment those senses were judged to be conceptually similar to one another, suggests that those senses are related on the basis of the same image schemas in different domains.

It is important to note that image schemas motivate rather than predict sense extensions in the polysemous words (Lakoff 1987; Lakoff and Johnson 1980). They do not strictly determine sense extensions. However, this does not mean that the sense extensions are arbitrary. The motivated sense extensions are constrained by the embodied image-schematic knowledge and by the types of cognitive links relating different senses, including image-schematic transformations, metonymic extensions, and metaphorical instantiations of image schemas in different domains (Section 3.2).

Image schemas are not necessarily semantic representations. Being embodied preconceptual meaning structures, they are not necessarily consciously represented or activated during on-line language processing. Even though they motivate various abstract concepts, they themselves are not necessarily semantic representations of those concepts.³⁰ It is in Chapter Four of the thesis that I investigate the nature of correspondences between preconceptual and semantic structures.³¹

Chapter Three of the thesis contains the empirical evidence in support of the image-schematic motivation of polysemy. In this, it is consistent with Lakoff's

³⁰In other words, I am assuming that experience is mapped onto a representation system through which we can manipulate, categorise and understand it.

³¹ In other words, I will investigate which elements of image schemas are mapped onto the conceptual structure of the preposition *in*.

(1990) “cognitive commitment”, which emphasises the importance of incorporating data from various related disciplines such as Psycholinguistics, Cognitive and Developmental Psychology for our understanding of language, and the importance of the empirical evidence for the linguistic constructs. Lakoff’s notion stresses the importance of the conceptual and experiential basis of linguistic categories and suggests that the formal structures of language be studied not as if they were autonomous, but as reflections of general conceptual organisation, categorisation principles, and processing mechanisms.

4. CHAPTER FOUR:

A Cognitive-Semantic Analysis of the English

Preposition *in*:

Part Two

4.1 Orientation

Chapter Four presents the second part of the semantic analysis of the English preposition *in*. Section 4.2 introduces the descriptive tools employed in the analysis. Emphasis is laid upon configurational and relational properties of the arguments. In Section 4.3, the category structure of the preposition *in* is discussed. In Section 4.3.5, conceptual metaphors motivating the abstract senses of *in* are presented. The category structure, featuring the three senses of the prepositional predicate *in* motivated by image schemas for CONTAINER (IN-1), PART-WHOLE (IN-2) and PATH (IN-3) which emerged from the three experiments in Chapter Three (Section 3.4.5), is presented in Sections 4.3.6-4.3.8. Section 4.4 presents conclusions to Chapter Four.

4.2 Descriptive tools

4.2.1 Introduction

In Section 4.2.2, I will discuss the trajector-landmark organisation of the prepositional predicate. Configurational, functional and relational features of the arguments will be presented in Section 4.2.3.

4.2.2 The fifth dimension of mental imagery: designation and trajector-landmark organisation

In Cognitive Semantics, grammar is regarded as part of human knowledge allowing a speaker to manipulate specific sets of symbols, basically audio-oral in nature, for the purposes of inter-personal communication (Hawkins 1985). The creative aspects of language are attributed not to the grammar itself but to the

human being. The use of language is thus a problem-solving task for which we depend upon the knowledge of grammar.

Grammar is not seen as a self-contained generative system but as a structured inventory of conventional linguistic units. The inventory is structured and thus manageable by means of symbolisation, schematicity, prototypicality and integration (Hawkins 1985).

A unit is a specific type of knowledge structure whose internal construction does not have to be attended to and the manipulation of which is thus automatic. The central feature of human language is that it is symbolic in nature (Langacker 1987). Linguistic units can be of three types: phonological, semantic, and symbolic. The minimal symbolic unit is a morpheme, where no subpart of the one pole stands in direct symbolic relation with any subpart of the other. Semantic units are conceptual units which have gained special status within the language system.³² The minimal semantic unit in a symbolic relation is a predicate (Langacker 1987: 43).

A predication is made relative to one or more cognitive domains. The collection of domains activated by a predication is called its matrix. A distinction can be made between basic and abstract domains:

“I will refer to a primitive representational field of this sort as a basic domain. A fair number of distinct basic domains must be posited on the grounds that they cannot be fully reduced to another, though they are certainly not unrelated and we are hardly in a position at present to achieve a definite list or description of their interconnections.” (Langacker 1987: 56)

All non-basic domains are abstract. Abstract domains are higher-order conceptual complexes, indirectly grounded in basic domains:

“Any concept or conceptual complex that functions as a domain for the definition of a higher-order concept, will be called an abstract domain.” (Langacker 1987: 57)

The concept behind “abstract domain” is not new:

³² Semantic structures are internal representations which have been conventionalised for purposes of linguistic symbolisation. Thus, as conventionalisation is a function of a given population, semantic structures are not universal. Linguistic relativity (or the Sapir-Whorf hypothesis) is manifested through various systems of conceptual metaphors that different communities have to conceive of the same abstract concepts. In western culture, for instance, time is a valuable resource (*TIME IS MONEY, LET'S NOT WASTE ANY TIME*) (Lakoff and Johnson 1980).

“An abstract domain is essentially equivalent to what Lakoff (1987) terms an ICM (for idealised cognitive model) and what others have variously called a frame, scene, schema, or even script.” (Langacker 1987: 61)

Those portions of a domain (or matrix) that are directly relevant for a particular predication constitute its base. Within this base, some entities are considered as more salient or prominent than others. These will stand out as a profile. The profile is thus a substructure that has been raised to a special level of prominence. Imposing a particular profile on a base is called a designation, the relation that holds internally to a semantic structure.

In turn, a profile is organised in terms of figure and ground. The figure is called the trajector (TR) and the entities constituting the ground are called landmarks (LM).

Designation and trajector-landmark organisation make up the fifth dimension of imagery.

“ Finally, predications invoking the same content can be distinguished by the relative prominence accorded various substructures. [...] First, within the base provided by the content that falls within its scope, every predication profiles (i.e. designates) some entity. [...] Second, expressions that designate relationships accord varying degrees of prominence to the relational participants. In particular, one participant - termed the trajector - stands out as the figure within the profiled relationship.” (Langacker 1991: 4)

For example, *in* in *I have got something in my eye* profiles a relation between the trajector (something) and the landmark (my eye). The relation is profiled against the domain of oriented physical space. The human body is a part of the domain, thus it constitutes the base in the designated relation.

Prepositional predicates profile static relations, with configurational as well as relational information reflected in the structure ascribed to them. Configurational information is elaborated by geometrical as well as functional properties of the arguments. The relational structure is determined by Force Dynamics (Section 4.2.3.2.1).

4.2.3 Configurational and relational properties of prepositional predicates

A spatial preposition typically locates a trajector relative to a landmark in the domain of oriented physical space. The LM serves as a reference point. In order to qualify as a prototypical *in* relation, the TR has to be located in a fairly confined area inside the LM. This area is called a search domain:

“ The search domain is defined as the region to which a locative expression confines its trajector [...]. Observe that a phrase like ‘under the bed (is all dusty)’ is construed as naming a spatial region - a type of ‘thing’ - rather than a relationship (a relationship per se can hardly be dusty). Our ability to conceptually reify and refer to the search domain argues strongly for the psychological validity of this notion.” (Langacker 1993:16)

The notion of the search domain is synonymous to that of an active zone. An active zone is a significant part of the profile of the elaborating structure. The significance of an active zone can be illustrated by the two possible interpretations of the predicate in *The nails are in the box*. One of them involves the interior of the box, the other its outer surface. Henceforth, the trajector and the landmark will stand for their respective active zones participating in the relation (Section 2.2.6).

It is assumed that a semantic analysis must capture the content common to any observed semantic natural class (Hawkins 1985). There are two prominent semantic classes pertaining to prepositional predicates, configurations of the LM and the TR, and relations between the two profiled entities. Configurational properties of the arguments (i.e. the trajector and the landmark) will be discussed first.

4.2.3.1 Configurational properties of trajector and landmark entities

4.2.3.1.1 Trajector configurations

Hawkins (1985) proposes an inventory of nine spatial configurations for trajector entities (path [terminative, initiative, perfective, imperfective, circuitive, non-rectilinear], area, space, indeterminate) which are distinguished on the basis of topological and geometric properties.

Four trajector configurations will be relevant to the current study. The terminative path, indeterminate and space configurations have been introduced by Hawkins (1985). Lindner (1982) identified reflexive trajectors, which profile only one entity in the relation. For example, in *The syrup spread out*, the trajector is its own landmark which is moving relative to its own prior boundary (Lakoff 1987). In *The house is in ruins*, the trajector is the initial state of the metaphorically construed process whose result is the landmark.³³ In other words, the two arguments refer to one entity which has undergone a process of deterioration

³³ The conceptual metaphor motivating the relation is *PROCESSES ARE PATHS* (Lakoff and Johnson 1980). All metaphors used in the analysis are presented in Section 4.3.5.2.

conceptualised along the up-down terminative path. The four configurations are discussed below.

1. The terminative path

It is a spatial configuration with significant extension in a single dimension. The terminus of the path is salient, as in *Put the butter in the fridge*. The terminative path configuration will also be used for predicates which designate a metaphorical PATH (*Dinner will be ready in ten minutes*)

2. Indeterminate

It is a spatial configuration which fails to have significant extension in any dimension. Consequently, there is absence of any configurational information (*He is in bed*). The indeterminate configuration will be most frequently manifested by the trajectors in Sections 4.3.6- 4.3.8 below.

3. Space

It is a spatial configuration with significant extension in all three dimensions. In *There is paint in the jar*, the trajector is lexicalised by a mass noun extended in a three-dimensional container. In Section 4.3.6 below, I will suggest that the space configuration of the trajector is manifested by the most prototypical instances of *in*.

4. Reflexive

The reflexive trajector configuration is superordinate in comprising the terminative path, space and indeterminate configurations. In *The house is in ruins*, the initial configuration of the TR/LM entity is space. The process of its deterioration is conceptualised metaphorically as a terminative path along the up-down axis. The final configuration of the TR/LM entity is indeterminate (Section 4.3.6.3.4).

4.2.3.1.2 Landmark configurations

Landmark configurations are differentiated with respect to specific relational potential of the configuration. Hawkins (1985) distinguishes four spatial configurations for landmark entities (medium, surface, channel, indeterminate). The LM configuration medium may give rise to the relation of CONTAINMENT. Thus, it is relevant to the present analysis.

Hawkins (1985: 95) defines MEDIUM as

“[...] something that encompasses or envelops other things; a condition, atmosphere, or environment in which something may function or flourish (Webster’s New World Dictionary).”

The medium landmark reflects its potential to bear the relation of inclusion or containment to other entities. Mediums are discerned with reference to dimensionality, porosity and boundedness.³⁴

To sum up, I suggest that the trajector and landmark configurations discussed above constitute e-sites for the entities elaborating them. Hawkins defines an e-site as

“[...] a schematic configurational content in the profile which provides an environment for elaboration by an adjoining semantic structure.”
(Hawkins 1985: 143)

Those schemas for the relevant active zones of the arguments are elaborated by geometric idealisations and functional properties.

4.2.3.1.3 Geometric descriptions

In Section 2.2.4 of the thesis, I emphasised the distinction between the objective reality and our conceptualisations of objects and relations. The referring function of language is highlighted by prepositional predicates since they denote our conceptualisations, or geometric descriptions, of objects which apply to various geometric figures (points, surfaces, volumes) associated with the object (Herskovits 1986). Moreover, the same object may be conceptualised in different ways according to the perspective from which the scene is considered (Section 2.2.5).

“An important part of the discrepancies between the definition of the preposition and the scenes these prepositions describe may be explained by the geometric description of the objects.” (Vandeloise 1984:177)

Geometric idealisations relevant to our conceptualisation of the active zones of the arguments profiled by the prepositional predicate *in* are presented below. First, geometric descriptions of the four trajector configurations are presented.

³⁴ Types of medium will be discussed in Section 4.2.3.1.3.2 below.

4.2.3.1.3.1 Geometric descriptions of trajector configurations

In Section 4.2.3.1.1, I distinguished four trajector configurations. The indeterminate configuration is idealised to a point. The profiled part of the terminative path configuration, the terminus, is also a point-like entity. The space configuration is elaborated by volumes (liquids or masses). In the reflexive trajector configuration, the initial TR/LM entity is idealised to a volume.³⁵ The final configuration is conceptualised as a point.

4.2.3.1.3.2 Geometric descriptions of the landmark configuration

The landmark configuration medium can give rise to the relation of CONTAINMENT, which defines the prepositional predicate *in* (Section 4.2.3.1.2).

Cuyckens (1993) distinguishes three features along which the active zones labelled mediums can be defined. Those are dimensionality, porosity and boundedness. Thus, mediums can be 3 DIM (e.g. jar), 2DIM (e.g. desert), 1DIM (e.g. line) and 0DIM (e.g. point). They can be porous (room) or non-porous (wall). Bounded mediums profile both an enveloping environment and its definite boundaries (jar). Non-bounded mediums are active zones featuring free outward surfaces, some of whose boundaries are vague (water).

I suggest that 3DIM, porous, bounded mediums should be further distinguished on the basis of the direction of the trajector's (potential) movement preceding the relation.³⁶ Consequently, the trajector's (potential) movement along the front-back axis will precede the relation with channel landmarks. The movement along the up-down axis will characterise cylinder landmarks.³⁷

The direction of the trajector's potential movement usually coincides with the orientation of the landmark determined by the position of its opening (Section 2.2.5). For instance, in *The paint is in the jar*, the predicate profiles a 3DIM, porous, bounded medium classified as a cylinder due to both the direction of the trajector's movement and the position of the opening. In *He is in the bedroom*, the medium is a 3DIM, porous, bounded active zone labelled "channel" as the position of the opening as well as the direction of the trajector's movement

³⁵ The geometric idealisation to a volume is justified by the prominence of the FULL-EMPTY schema in the base (Section 4.3.6.2.1).

³⁶ The importance of the notion of potential movement for the relation of CONTAINMENT has been recognised by Vandeloise (1991).

³⁷ In other words, a channel landmark is a rotated cylinder landmark (Lakoff 1987).

impose a front-back orientation on the landmark. If a medium features no obvious opening (corner, middle), the direction of movement will serve as a determinant.³⁸

I suggest that the notion of potential movement should be regarded as an illustration of the first type of subjectification (Section 2.2.5).

Below, I discuss seven types of medium which are relevant to the current study. The descriptions refer to the active zones of the referent objects functioning as mediums (Section 4.2.3).

1. 3DIM, porous, bounded, cylinder, mediums are elaborated by

“[...] shells [...] with a solid external boundary circumscribing a three-dimensional interior with a consistency quite different from the boundary.” (Hawkins 1985: 253)

“As complete closure is relatively rare [...] some boundaries of the interior will usually be imaginary.” (Herskovits 1986: 150)

Consequently, the active zone will be instantiated here by (fully or partially surrounded) cup-like concavities (head, jar, eye, bed, rack) or spaces delimited by imaginary planes (trousers, arms, hand).

2. 3DIM, porous, bounded, channel mediums can be elaborated by (completely or partially) delimited box-like entities (room, car, fridge), spaces bounded by imaginary planes (corner, middle, stirrup) including openings (window, doorway).

3. 3DIM, non-porous, bounded mediums are elaborated by entities conceptualised as laminas (*There is a hole in the road*)³⁹, groups of solid objects (grass, queue) or volumes (coffee, wall).

4. 3DIM, non-porous, non-bounded mediums are elaborated here by volumes (water).

5. 2DIM, bounded mediums are geometrically described as planes (Scotland, desert).

6. 1DIM mediums are elaborated by lines (graph);

7. 0DIM mediums are elaborated by points (*The sun is in my face*).

In Section 4.3.6.3.2, I will argue that 3DIM, porous, bounded, cylinder landmarks are the most prototypical for the relation of CONTAINMENT.

³⁸ Boers (1994:45) claims that “the recognition of a distinct schema is motivated by the occurrence of figurative extensions from precisely such a schema”. In Section 4.3.6, I will try to demonstrate that the distinction into cylinder and channel landmarks is borne out by the Invariance Hypothesis (Lakoff 1990; Turner 1993).

³⁹ Full sentences are quoted to avoid ambiguity when alternative conceptualisations are possible.

4.2.3.1.3 Functional properties of the trajector and the landmark

Vandeloise (1991) points out that geometrical and topological properties of arguments result from their functional properties. There is only one functional property of the trajector which is relevant for the relation of CONTAINMENT; namely, the trajector should have the potential to fill the container landmark. In *The paint is in the jar*, the potential is realised by the space trajector whose geometric description is that of a volume (Section 4.2.3.1.3.1).

The landmark manifests six functional properties. The asymmetry can be explained by the landmark's prominence for prepositional predicates:

“ In the static relations, the landmark tends to be important as it functions as a reference point. As a result, the LM configuration tends to be overtly elaborated.”(Boers 1994: 45)

The six functional characteristics of mediums are presented below:⁴⁰

1. containers can carry things (hand, arms);
2. or store them (jar, room);
3. they hide objects (head, trousers);
4. or display them (window);⁴¹
5. containers protect the contained object (arms, head);
6. they can be filled (jar, eye, rack).⁴²

The relevance of those functional properties will be justified, in consonance with the Invariance Hypothesis, by the analysis of the metaphorical extensions of the preposition.

4.2.3.2 Relational properties of the predicate *in*

In Section 4.2.3, I pointed out that a semantic analysis of a prepositional predicate should account for configurational and relational features of the arguments.

Hawkins (1985) postulates two basic relations valid for prepositional predicates. These are COINCIDENCE, where the place of the trajector (or one of its parts) coincides with the place of the landmark (or one of its parts) and SEPARATION, where no part of the trajector coincides with the place of any part

⁴⁰ See Section 3.3.4.

⁴¹ In Section 4.3.4, I will suggest that prototypical relations of CONTAINMENT do not profile landmarks manifesting that functional property.

⁴² That functional property is motivated by the FULL-EMPTY image schema (Section 3.4.2). In other words, prototypical containers can be filled by space trajectors. The process is oriented along the up-down axis.

of the landmark. The English preposition *in* profiles the relation of COINCIDENCE.

I propose that the predicate *in* profiles a relation of CONTAINMENT. Johnson (1987) argues that the CONTAINER schema is dynamic. The container protects the contained from outside forces as well as restraining its movements (Section 3.3.4). Vandeloise (1991: 225) states that it is the landmark that controls the position of the contained object.

In order to describe the preposition *in* as a dynamic schema, the concept of Force Dynamics in Cognitive Semantics will now be presented.

4.2.3.2.1 Force Dynamics

Force dynamic systems describe the behaviour of physical entities with respect to the application of FORCE. Talmy (1988)⁴³ claims that meanings generated by the system are represented by various closed-class items.

Force Dynamics is a way of representing how the schematic relationship OBJECT AT LOCATION and its derivative MOVEMENT schema are affected over time when two objects interact.

While we do not live in a Newtonian world where all motion is relative, we do conceptualise a world which is governed by the laws of inertia. Our experience tells us that changing a spatial relationship requires energy that is embodied in one of the entities in THE CHANGE OF LOCATION schema. The object whose movement defines the event is called the agonist and the object that interacts contrary to the agonist is the antagonist. Objects, whether agonist or antagonist, tend either toward movement or rest. Whether or not the event takes place or the agonist moves is determined by the relative strength of the two entities. The steady states can change over time. The agonist can either enter or leave the relationship with the antagonist, or the relative strengths of the two objects can change.

⁴³ Talmy focuses on the force dynamic analysis of the meaning of causatives. Sweetser (1990) extends the force dynamic system to describe the meanings of modals in English. Talmy's analysis of causatives and Sweetser's analysis of modals demonstrate the need for attributing FORCE to entities in image schemata because those relationships are preserved between source and target domains. These theories show how the entities in image schemata interact with respect to FORCE. The addition of vectors and potential movement add to the descriptive power of the theory in that movements can take different forms.

In the relation of CONTAINMENT, the FORCE of the antagonist (LM) is typically greater than that of the agonist (TR). Consequently, the landmark controls the position of the trajector and determines its fixed location.

According to Johnson (1987), FORCE is experienced through interaction only and is additionally characterised by the following features:

1. the notion of direction (a goal of the movement);
2. the notion of potential movement: FORCE embodied in one of the entities is potential and not kinetic (Section 4.2.3.1.3.2).

Summing up, the force dynamic relation manifested by the prepositional predicate *in* is that of CONSTRAINT (Section 3.4.4.1.4). I propose that the FORCE gestalt for CONSTRAINT manifests three realisations (C1, C2, C3). C1 defines the CONTAINER (Section 3.4.4.1.1), C2 the PART-WHOLE (Section 3.4.4.1.2) and C3 the PATH image schema (Section 3.4.4.1.5). As deixis is a part of the structure of the schema (Section 2.2.5), I will adopt the viewpoint of an outside observer in my descriptions.⁴⁴

Each of the schemas is structured as a prototypical category (Section 2.3.6.2).

1. CONSTRAINT ONE (C1)

The schema defines the relation between the agonist whose potential movement precedes the relation and the antagonist. The antagonist keeps the agonist within its limits, usually blocking it from the view of the outside observer. The CONSTRAINT schema C1 is profiled by the uses of *in* subsumed under the first sense category (IN-1) (Section 4.3.6). Central instantiations of the schema (*The brain is in the head, He is in the bedroom*) are characterised by the agonist's total inclusion within the limits of the antagonist. Less central examples feature partial inclusion (*The nails are in the board*). Peripheral instances (*My foot is in stirrup, There are toys in the window*) show an overlap with the category IN-2 characterised by the CONSTRAINT schema C2; *Slice the potatoes in two* shares a force dynamic pattern with the CONSTRAINT schema C3.

2. CONSTRAINT TWO (C2)

The CONSTRAINT schema C2 features a relation between an antagonist and an agonist in which the (potential) movement of the trajector preceding the relation is not prominent (*The curve is in the road*). Moreover, the experiential

entailments of the CONSTRAINT schema, the invisibility of the trajector and/or its inaccessibility to the outside observer, are suspended. In other words, the agonist is displayed by the container (Section 4.2.3.1.3). Prototypical examples defined by the schema C2 show a featural overlap with members of the IN-1 schema. Peripheral instances share a number of features with the prepositional category *of* (Section 4.3.7).

3. CONSTRAINT THREE (C3)

The agonist's mobility is initially unrestricted by the antagonist (*Put the butter in the fridge*). The relation changes once the agonist is included within the boundaries of the antagonist. The resulting force dynamic schema is that of C1. The image-schematic profile of the category C3 corresponds to that of the preposition *into* (Section 4.3.8).

The definitions of the three realisations of the CONSTRAINT schema correspond to those of the image schemas for CONTAINER (C1), PART-WHOLE (C2) and PATH (C3) in Section 3.4.2.1. They share the feature of the landmark constraining the trajector but differ with respect to the salience of the PATH schema in the base and the prominence of the trajector in the profile. Therefore, I suggest that the three types of the CONSTRAINT schema distinguished above motivate the polysemy of *in* at the most abstract level of categorisation (Section 4.3.2). I also suggest that the C1 schema defines the prototypical *in* predicates (Section 4.3.6).

4.2.4 Conclusions

In Section 4.2, the descriptive tools to be used in the case study in Section 4.3 have been discussed. I have argued that a semantic analysis of a prepositional predicate should account for configurational, functional and relational characteristics of the trajector and the landmark. Those features should be regarded as parameters of an experiential gestalt motivating the meaning of a prepositional category.

⁴⁴ Consequently, my semantic analysis will not include parameters resulting from adopting the

4.3 The category structure of the preposition *in*

4.3.1 Introduction

4.3.2 The preposition *in* as a polyseme

In Section 3.4.5, I suggested that the preposition *in* is a polysemous item. The definition of polysemy in Cognitive Linguistics refers to particular sets of symbolic units within the grammar.⁴⁵ Thus, two features of any set of symbolic units exhibit polysemy; the unit at the phonological pole is identical throughout the set. The phenomena at the semantic pole exhibit significant variation.

Each of the symbolic units exhibits a different predicate at its semantic pole. The predicates in the set are linked. The most significant aspect of polysemy is the variation in the predicates within the set of polysemous symbolic units.

Hawkins (1985) postulates that polysemy should be recognised in any case in which a preposition exhibits contrasting predicates (profile/base structures) regardless of whether the contrast is attributable to the immediate linguistic environment. In other words, polysemy is recognised whenever a given preposition exhibits predicates that vary in the configurational and/or relational content in the profile. For example, *The brain is in the head* and *Put the butter in the fridge* are two distinct senses of *in* with regard to their respective configurational contents. The former profiles an indeterminate trajector configuration; the latter profiles a TR whose configuration is the terminative path.

Differences in trajector configurations presuppose differences in the respective bases of the relations. In *Put the butter in the fridge*, unlike *The brain is in the head*, the PATH figures prominently in the base.

Polysemy is also recognised when identical structures are profiled against contrasting bases. In *The brain is in the head*, the relation is profiled against the base of the human body which is a part of the domain of physical space. In *Have you ever been in love?*, the predicate is profiled against the abstract domain of emotions.

In Section 2.4.3.1, I adopted a definition of polysemy as a gradable concept. Consequently, I will distinguish between ambiguity and vagueness.

Vagueness will be manifested by predicates subsumed under the same subordinate schema. For example, *We are in Scotland* and *He lives in our*

other possible vantage point, for example the degree to which the trajector feels restrained.

neighbourhood both elaborate a schema defined by a 2DIM, bounded landmark, an indeterminate trajector and a force dynamic relation of CONSTRAINT (C1). The two predicates differ only with respect to the geometric idealisation of their landmarks. Ambiguity will be manifested by examples subsumed under different schemas.

Consequently, I will recognise polysemy at different levels of abstraction. In *He is in the bedroom*, the predicate instantiates a schema defined by a 3DIM, porous, bounded, channel LM and an indeterminate trajector. The landmark manifests four functional features central to the relation of CONTAINMENT (hiding, protecting, storing and being filled). In *Fish swim in the water*, the predicate profiles a 3DIM, non-porous, non-bounded landmark, an indeterminate trajector and two functional properties of the LM (hiding and protecting). Nevertheless, the two predicates share a force dynamic schema of CONSTRAINT (C1). Thus, they are less polysemous than *The brain is in the head* and *There is a curve in the road*, which differ at the superordinate level. In other words, they are examples of the distinct senses of *in*. The former instantiates the CONTAINER schema (IN-1). The latter illustrates the PART-WHOLE schema (IN-2).⁴⁶

4.3.3 The preposition *in* as a radial category

In Section 2.3.6, I adopted a usage-based model of categorisation for the semantic analysis of the preposition *in*. In other words, the 56 uses of the preposition will be defined in terms of both prototype(s) and schemas. Specific examples will be arranged in a radial category structure.

Radial categories have a centre-periphery organisation. They build around a central schema or prototype and include as members of the category those schemas that show resemblance or relatedness to the central case. In other words, a radial category is a typical prototype phenomenon.⁴⁷ The major challenge in describing radial categories is two-fold:

a) to define the central (or prototypical member of the category),

⁴⁵ A detailed survey of cognitive approaches to polysemy is provided in Section 2.4.3 of the thesis.

⁴⁶ The three senses of *in* have been distinguished on the basis of the results of Experiment 2 (Section 3.4.3.1)

⁴⁷ Hawkins (1985) discusses correspondences between Rosch's model of natural categories and their treatment in Space Grammar. He concludes that Rosch's model contributes to the structure within the inventory of conventional units in the following ways:

- vertical relation is rendered by schematicity
- the superordinate unit is a schema
- members of the taxonomy are elaborations of the schema.

b) to describe the ways in which the non-central members are related to the prototype by providing motivation for the inclusion of those non-central members as extensions from the prototype. On the one hand, motivation suggests a non-arbitrary link between central and non-central cases. On the other hand, extensions from the prototype cannot be predicted.

The relation between a schematic unit in the grammar and a particular elaboration of that schema in actual language use is called sanction. A conventionalised schema sanctions the use of its specific elaborations. For instance, *in* in *The brain is in the head* is fully sanctioned by the schema IN-1 defined by a medium LM, an indeterminate TR configuration and a force dynamic schema C1. In other words, it instantiates the schema without any strain.

Extensions from a schema occur through partial sanction. A usage event that is only partially sanctioned by the schema is not fully compatible with the schema's specifications. For example, 2DIM, bounded mediums are extended from 3DIM, bounded mediums with respect to dimensionality. Boers (1994) regards phenomena of that kind as a diachronic extension. In other words, there exist certain parameters of a schema which occur in our experience prior to extended values (Section 2.3.6.2).

I suggest that 3DIM, porous, bounded cylinder landmarks with the prominent functional attribute of hiding motivate 2 (or less) DIM, non-porous, non-bounded, channel landmarks with the prominent functional attribute of displaying (Section 4.3.6).

Partial sanction will also be recognised for figurative uses. In *Have you ever been in love?*, the relation is profiled against the abstract domain of emotions, the structure of which has been adopted from the experientially more basic spatial domain.

4.3.4 The image-schematic structure of the preposition *in*

In Section 3.2, I adopted a view that image schemata motivate connections between the senses of polysemous words.

The results of Experiment 1 presented in Section 3.4.2.1, suggest that the meaning of the 56 uses of the preposition *in* is, at least partially, structured by six preconceptual image schemas. Those are CONTAINER, PART-WHOLE, MERGING, PATH, FULL-EMPTY and FORCE.

The results of Experiment 2 discussed in Section 3.4.3.1, indicate that the category structure of the preposition is organised around three related senses motivated by the schemas for CONTAINER, PART-WHOLE and PATH respectively. The results of Experiment 3, Section 3.4.4.1, point to the prominence of the CONTAINER schema in motivating the meaning of the preposition *in*. Therefore, I propose that the central uses of the preposition *in* are defined by the CONTAINER gestalt, whose parameters are presented below:⁴⁸

1. the LM is a 3DIM, porous, bounded cylinder, which can carry and/or store the contained entity. The LM hides the TR from the view of the outside observer and/or protects it from external forces. The container profiles the FULL-EMPTY schema (Section 3.4.2.1);
2. the space TR is able to fill the container;
3. the relation is characterised by the CONSTRAINT (C1) schema for FORCE (Section 4.2.3.2.1).

As suggested in Section 4.3.3, the three sense categories of *in* are family resemblances. Thus, the gestalt for the CONTAINER schema is realised to a different degree by the 56 uses of *in*.

Family resemblance chains are distinguished with respect to four geometric (1-4) and five functional (5-9) features of the LM (Section 4.2.3.1). The TR is considered with respect to geometry (10) and function (11). The FORCE schema for CONSTRAINT manifests degrees of prototypicality along the two continua, which are the prominence of the PATH and the salience of the trajector (12).

The twelve possible family resemblance chains are presented below:

- 1) dimensionality (room→desert→road→head)⁴⁹;
 - 2) boundedness (head →road→water);
 - 3) porosity (room→grass→water→wall);
 - 4) orientation (jar→room);
- the container's functional ability to
- 5) carry (jar);
 - 6) store (jar→room);
 - 7) hide (ore→room→window);
 - 8) protect (jar→arms→stirrup);

⁴⁸ The description of the CONTAINER gestalt is partly based on Johnson's (1987) definition of the IN-OUT schema.

⁴⁹ In *There is a curve in the road*, the LM is conceptualised as a 1DIM entity. In *He was shot in the head*, the LM is conceived as a 0DIM point.

- 9) be filled (jar→room→rack);
- 10) the TR configuration can be space, indeterminate or reflexive;
- 11) the TR function is to fill the container;
- 12) the schema for CONSTRAINT is C1, C2 or C3.

I suggest that the IN-1 schema manifests the greatest number of the prototypical features characteristic of the meaning of *in*. Schemas IN-2 and IN-3 will be considered less central members of the category (Sections 4.3.7-4.3.8).

4.3.5 The figurative senses of *in*

4.3.5.1 The domains

The theory of conceptual metaphor claims that extension of the linguistic object's reference can take place because the defining features of the basic referent set can be translated into different cognitive domains. The expressions used to talk about the target domain are linguistic reflexes of the ontological correspondences between the source and target domain, via which inferences are made about the target domain (Section 3.2.4). The notion of domains is elastic and domain boundaries tend to be fuzzy (Section 4.2.2).

In this study, the following domains will be referred to:

- the domain of oriented physical space (“down” and “up” being determined by the force of gravity);
- the domain of the human body;
- the domain of communication;
- the domain of time;
- the domain of age;
- the domain of perception;
- the domain of cognition;
- the domain of action;
- the domain of values;
- the emotive domains.

Those domains are structured schematically and thus interrelated in several ways (Section 2.3.6.3.2):

- the domain of the human body may be considered a subdomain of oriented physical space;

- the domain of communication (linguistic action) may be considered a subdomain of action;
- time and space are interrelated basic domains that are part of virtually all events and activities;
- being a symptom of time, age may be considered a (specific) subdomain of time;
- cognition and perception are experientially interrelated domains;
- the domain of emotions comprises several subdomains: of states, conditions, characteristics, obligations.

Expressions activate domains. For example:

The paint is in the jar activates the domain of oriented physical space. *Dinner will be ready in ten minutes* activates the domain of time.

“Literal” instances of spatial prepositions are those that primarily activate the domain of oriented physical space (or its subdomains). Primary activation of other domains is an indication of “figurativeness” (Boers 1994: 49). However, I suggest that “literalness” and “figurativeness” be conceived as gradual notions, a continuum from purely literal to highly figurative.⁵⁰

Consider, for instance, *Who is the woman in that painting?* The expression activates the domains of space, perception and communication (Section 4.3.6.3.2). In other words, the example has both literal and metaphorical characteristics. If we conceive of “literalness” and “figurativeness” as a continuum, then the example would figure somewhere in the middle.

4.3.5.2 The metaphors

“Figurative” senses of prepositions arise when their schemas are mapped onto abstract domains (Section 3.2.2). The following set of metaphors motivates the figurative senses of the items under investigation here (Lakoff and Johnson 1980):

Orientalional metaphors:

GOOD IS UP which entails

FULLY DEVELOPED IS UP

BAD IS DOWN which entails

DETERIORATED IS DOWN

BEING (PERCEPTUALLY/COGNITIVELY) SALIENT IS BEING AT THE FRONT

Ontological/structural metaphors:

COGNITION IS PERCEPTION

THE CONDUIT METAPHOR (Reddy1979):

IDEAS (MEANINGS) ARE OBJECTS

LINGUISTIC EXPRESSIONS ARE CONTAINERS

COMMUNICATION IS SENDING

The *CONDUIT METAPHOR* can be extended over communication in general (Brugman1981). Its entailments thus are:

MEANS OF COMMUNICATION ARE CONTAINERS

CONVEYING MESSAGES IS SENDING.

THE EVENT STRUCTURE METAPHOR (Lakoff 1993)

The metaphor defines various aspects of the event structure (states, changes, processes, actions, causes, purposes, and means) in terms of space, motion, and force.

The event structure metaphor is based on the dual metaphor for attributing properties or states to objects. In the location dual, the property or state is conceptualised as a location, and the object that has the property is schematised as existing in that location.⁵¹

The superordinate-level metaphor *STATES ARE LOCATIONS* has the following entailments:

STATES/ EMOTIONS/ CONDITIONS ARE CONTAINERS

NEGATIVE STATES/EMOTIONS/CONDITIONS ARE CONSTRAINERS.

Emotions are located in the body. Consequently,
THE BODY IS A CONTAINER FOR EMOTIONS and, according to the principle of transitivity,

PARTS OF THE BODY ARE CONTAINERS FOR EMOTIONS

EMOTIONS ARE VOLUMES IN CONTAINERS.

As time is conceptualised in terms of space, the ontology of time is understood in terms of things and motion (Lakoff 1993). Time can be conceptualised as

⁵⁰ Note that the matrix of an expression may contain domains of diverse degrees of complexity and abstraction (Section 4.2.2).

⁵¹ Lakoff (1993) introduces the term duality to explain the apparent inconsistencies in the mapping between experience and linguistic representation. He suggests that the conceptual metaphor theory provides a way to deconstruct the target domain to make it compatible with a multi-entity source domain and image schema.

stationary or moving (Lakoff and Johnson 1980). If time is a fixed location, the observer is moving with respect to it. Lakoff (1993) points to the following entailments:

- time has extension and can be measured;
- an extended time, like a spatial area, may be conceived of as a bounded region.

Thus:

TIME IS A PATH AND WE MOVE ON IT

PERIODS OF TIME ARE BOUNDED REGIONS OF SPACE

AGES ARE BOUNDED REGIONS OF SPACE.

I propose another entailment of the *STATES ARE LOCATIONS* metaphor, which is *SUBJECTS (OF STUDY) ARE AREAS.*

Other components of the event structure metaphor relevant to the current study are:

CHANGES ARE MOVEMENTS INTO OR OUT OF BOUNDED REGIONS

PROCESSES ARE MOVEMENTS (ALONG PATHS)

ACTIONS ARE SELF-PROPELLED MOVEMENTS (ALONG PATHS)

PURPOSES ARE DESTINATIONS, to which I suggest two entailments, namely

RESULTS ARE DESTINATIONS and *RESULTS ARE CONSTRAINERS*

MEANS ARE PATHS TO DESTINATIONS.

The orientational and structural metaphors listed above will be applied in the case study below (Sections 4.3.6-4.3.8).

According to the Invariance Hypothesis (Section 3.2.4), metaphorical mappings preserve the cognitive topology of the source domain in a way that is consistent with the inherent structure of the target domain. Moreover, the mapping onto target domains is restricted to salient features. In other words, the image-schematic profile of the target domain points to the most relevant features of the source domain. Thus, the analysis of the metaphorical uses of *in* will highlight the relevant parameters of the CONTAINER schema (Section 3.4.4.1.1).

4.3.6 The category IN-1

4.3.6.1 Introduction

The schematic structure of the category IN-1 is presented in Figure 1 below.

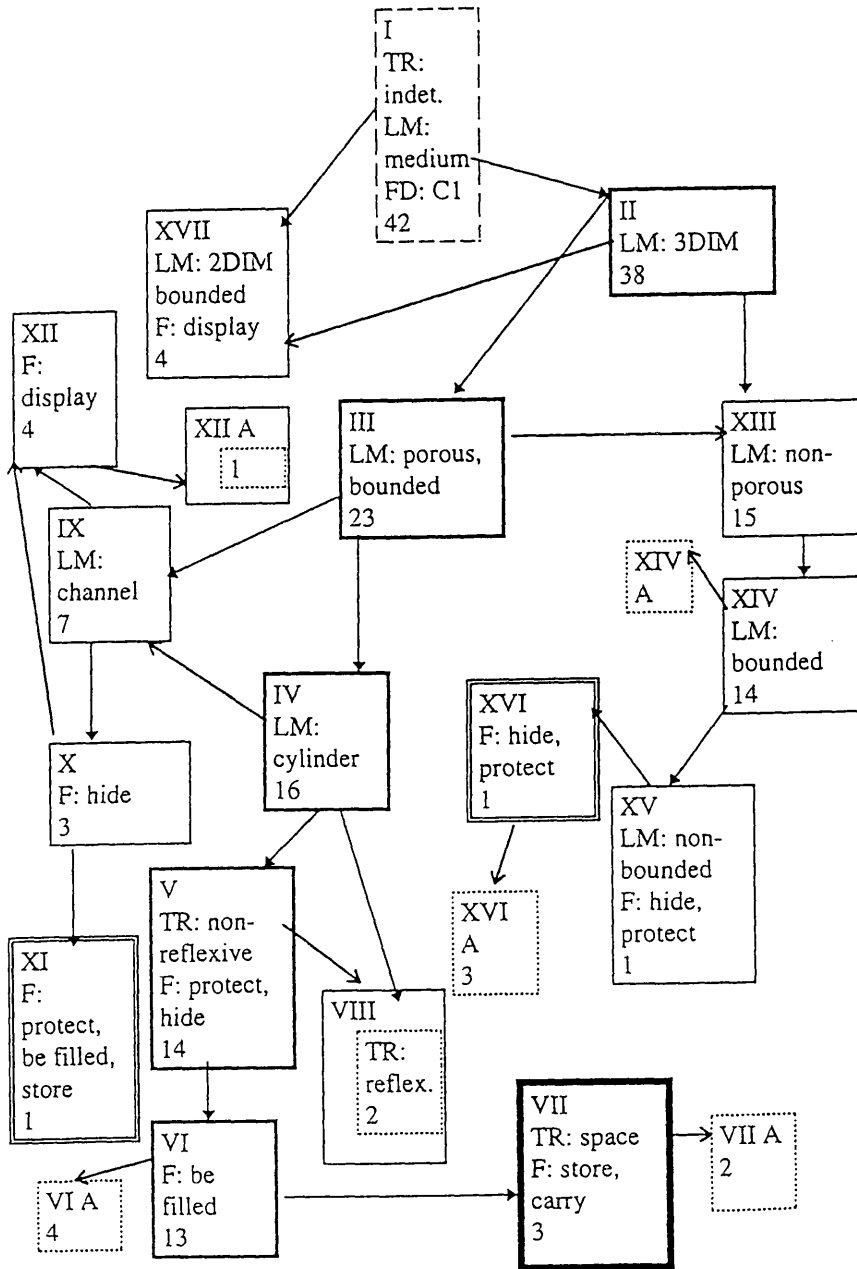


Figure 1. The schematic structure of the category IN-1

Figure 1 above comprises twenty-two schemas.⁵² The specification of each schema is at the top of the frame. Metaphorical uses are defined by the number of the schema they are extended from and the letter A. The number of uses subsumed by the schema is displayed at the bottom of the frame.

The superordinate schema for the category is in the broken-line frame at the top of the diagram (Schema I). It subsumes the forty-two uses of *in* at the highest level of abstraction. The TR (indeterminate) and the LM (medium) constitute e-sites to be elaborated by the specific uses. The force dynamic schema is specified as C1 (Section 4.2.3.2.1).

The full-headed arrows symbolise elaborations of the schema which conform to its specifications but characterise it with finer detail (Langacker 1988). The elaborations specify the features of the landmark (LM), the trajector (TR) and the functional properties (F).

The partial-headed arrows symbolise meaning extensions or

“ imply some conflict in specification between basic and extended values.”
(Langacker 1988: 134)

Thus, I assume that 3DIM, porous, bounded, cylinder landmarks and non-reflexive, space trajectors are more experientially basic than their respective opposites. Moreover, the landmark which is able to hide the TR is more prototypical than that which displays it (Sections 4.3.3). Consequently, the features in bold-border frames (Schemas II-VII) represent the prototypical parameters of the CONTAINER schema (Section 4.3.4).⁵³

The examples in the thick bold-border frame (Schema VII) represent the global prototype for the category *in*.⁵⁴ Instances in double-border frames stand for local prototypes (Langacker 1988). Metaphorical extensions are placed in dotted-border frames. Examples whose status on the continuum between literalness and figurativeness is uncertain are placed in dotted-border frames surrounded by single-border ones (Section 4.2.4.2).

First, I will analyse a set of sixteen examples defined by 3DIM, porous, bounded, cylinder landmarks. In each set of examples, the spatial instances will be

⁵² The schematic organisation is purely a reflection of my subjective opinion. As Hawkins (1985: 231) points out “the amount of structure within a category differs from one person to the next”.

⁵³ This definition of the prototypical parameters for the relation of CONTAINMENT is consistent with the findings of Developmental Psychology (Section 3.3.4).

⁵⁴ The prototype will be discussed in Section 4.3.6.2.3.

discussed first (Section 1.2). The analysis of metaphorical extensions is presumed to offer a deeper insight into the semantics of the spatial senses.

4.3.6.2 Schema IV: 3DIM, porous, bounded, cylinder landmarks

4.3.6.2.1 Schema V: non-reflexive trajectors

There are fourteen uses of *in* defined by the prototypical LM hiding the non-reflexive TR. The six metaphorical uses (Schemas VI A and VII A) will be extended from the spatial examples. The eight spatial uses subsumed under Schema V are:

1. Do you recognise that man in jeans?
2. He is in bed.
3. The magazine is in the rack.
4. There is a stone in my hand.
5. She has got a child in her arms.
6. There is something in my eye.
7. The brain is in the head.
8. The paint is in the jar.

In the eight examples above, the relation is profiled against the domain of oriented physical space, a part of which is the base of human body. In the first seven uses, the TR configuration is indeterminate. Example 8 profiles a space TR. In Examples 1-3 and 6, the landmarks are geometrically idealised to box-like openings closed by imaginary horizontal planes. In Examples 4 and 5, the geometric descriptions involve space-like interiors delimited by many imaginary planes. In Example 7, the opening of the container is imaginary. Example 8 is the global prototype of the category and will be discussed in Section 4.3.6.2.3.

In Example 1, the landmark (jeans) is moved by the metonymic trajector (hands) to contain the active zone of the TR (legs). Thus, I suggest, contrary to Herskovits (1986: 153), that the relationship between Figure and Ground is not inverted in Example 1 as the movement is performed by the (metonymic) trajector. Moreover, the landmark controls the position of the trajector (its active zone participating in the relation).

4.3.6.2.2 Schema VI

The schema is elaborated by the following instances:

2. He is in bed.
3. The magazine is in the rack.
4. There is a stone in my hand.
5. She has got a child in her arms.
6. There is something in my eye.
7. The brain is in the head.

The six examples subsumed under Schema VI elaborate the LM with respect to the FULL-EMPTY schema (Section 3.4.2.1). In other words, the landmarks manifest the potential to be filled as in *Your head is full of stupid ideas*, *Her eyes were filled with tears*, or *My hands are full*. The two landmarks *bed* and *rack* are less prototypical with respect to that functional characteristic.

The landmarks in Examples 6 and 7 illustrate the concept of the transitivity of the relation of CONTAINMENT (Section 3.3.4). The *BODY AS A CONTAINER* schema motivates the conceptualisation of parts of the body (eye, head) as containers.

4.3.6.2.2.1 Schema VI A: metaphorical extensions

There are three metaphorical uses which can be extended from Schema VI:

9. Your car is in very good condition.
10. Have you ever been in love?
11. We watched the scene in horror.

In Example 9, the topology of the source domain is mapped onto the abstract domain of conditions in consonance with the two conceptual metaphors *CONDITIONS ARE CONTAINERS* and *GOOD IS UP* (Section 4.3.5.2).

Examples 10 and 11 profile relations against the abstract domain of emotions. The mapping can be summarised by an entailment of the event structure metaphor - *EMOTIONS ARE CONTAINERS*. In Example 10, the container is oriented along the up-down axis (*to fall in love*, *to be deeply in love*). In Example 11, the abstract container makes salient the CONSTRAINT schema C1. The negative emotion (horror) paralyses the movements and thus controls the position of the trajector (*We were horror-stricken*). Consequently, the mapping is summarised by the metaphor *NEGATIVE EMOTIONS ARE CONSTRAINERS* (Section 4.3.5.2).

To sum up, the three metaphorical extensions from Schema VI preserve the following topological features from the source domain:

- the up-down orientation of the landmark;
- the FULL-EMPTY schema;
- the CONSTRAINT schema C1.

According to the Invariance Hypothesis, those are the salient features of the CONTAINER schema (Section 3.2.4).

4.3.6.2.3 Schema VII: the prototype

In Section 2.3.6.2, I defined the prototype as the most frequently used representative of the category which displays the highest degree of family resemblance and is most likely to be activated in a neutral context. In other words, the prototype is a metonymic representation of the category (Section 2.3.6.3.1).

Cuyckens proposes that

“[...] spatial relations of complete COINCIDENCE between *x* and a 3DIM, bounded, porous medium with relatively high vertical sides are most prototypical. Examples are: ‘the milk in the glass’, ‘the jewels in the box’.” (Cuyckens 1993: 63)

I propose that the prototype of *in* be defined as a predicate profiling a relation of CONTAINMENT between a 3DIM, porous, bounded cylinder medium and a space trajector. The relation is characterised by the force dynamic schema C1 and manifests the five functional features discerned in Section 4.2.3.1.3. Consequently, I propose that Example 8 above be the prototype of the category IN-1. Assuming that the IN-1 schema is the most prototypical of the three senses of *in* distinguished here, I suggest that *The paint is in the jar* constitutes the global prototype for the category subsuming the 56 uses of *in*.

4.3.6.2.3.1 Schema VII A: metaphorical extensions

There are three metaphorical extensions from the prototype:

12. He is deaf in one ear.
13. He refused to say anything in reply to the question.
14. He spoke in Russian.

In Example 12, the abstract trajector is a characteristic (deafness) which a person can develop. The idea of being developed involves a gradual change towards a full form (a person can be partially or completely deaf). Consequently,

the relation in the abstract domain highlights the topology of the source domain with reference to the FULL-EMPTY schema and the space configuration of the trajector. In other words, characteristics are conceptualised as entities in a container (the person or his part) whose degree of intensity is mapped onto the up-down axis.

Those assumptions are in consonance with Kovecses'(1986) conclusions on the nature of emotions.⁵⁵ The two conceptual metaphors: *EMOTIONS (CHARACTERISTICS) ARE VOLUMES IN CONTAINERS* and *FULLY DEVELOPED IS UP* summarise the mapping (Section 4.3.5.2).

Examples 13 and 14 instantiate the conduit metaphor (Reddy 1979). Words of the reply as well as the words of the Russian language are containers for ideas (meanings). In communication, the containers are sent along the conduit (trajectory) to the interlocutor. In Example 13, the container (reply) was “sent empty”, as the person *said nothing in reply to the question*. The part of the conduit metaphor defining communication as sending along an imaginary trajectory is responsible for the link between IN-1 and IN-3, which is motivated by the PATH image schema.

To sum up, the three metaphorical extensions from the prototype highlight the following topological features of the source domain:

- the landmark is oriented along the up-down axis;
- the trajector configuration is space;
- the FULL-EMPTY schema motivates the orientation of the landmark;
- the container carries the entities contained.

4.3.6.2.4 Schema VIII: reflexive trajectors

In Section 4.2.3.1.1, reflexive trajectors were defined as entities moving relative to their own prior boundaries. Two examples elaborate Schema IV with respect to the trajector configuration:

15. Slice the potatoes in two.
16. The house is in ruins.

In Section 4.3.5.2, I defined the distinction between literal and figurative meanings as a continuum. The two instances above can be located in its middle. The relations activate the domain of oriented physical space but are motivated by conceptual metaphors. In both examples, the initial configuration of the trajector

is geometrically described as a volume. The activity of slicing (Example 15) and the process of deterioration (Example 16) diminish the original size of the trajector. The resulting configuration is thus indeterminate. Consequently, the respective processes are conceptualised as terminative paths along the up-down axis. Moreover, the initial state (configuration) of the trajector corresponds to its full form. The mapping is thus summarised by three conceptual metaphors: *FULLY DEVELOPED IS UP, DETERIORATED IS DOWN, PROCESSES ARE MOVEMENTS ALONG PATHS* (Section 4.3.5.2).

The terminative path along which the process is conceptualised corresponds to the PATH-FOCUS TO END-POINT FOCUS image-schematic transformation (Section 3.2.3) The PATH metaphor motivates the link between Schema VIII and the IN-3 category.

4.3.6.3 Schema IX: 3DIM, porous, bounded, channel landmarks

The schema subsumes seven uses of *in*. First, the landmarks manifesting the hiding function will be discussed.

4.3.6.3.1 Schema X: the hiding landmarks

The functional attribute of hiding is manifested by three landmarks:

17. They live in the middle of the wood.
18. There is a wardrobe in the corner.
19. He is in the bedroom.

In Examples 17 and 19, the landmarks are spaces delimited by imaginary planes (Section 4.2.3.1.3.2). The geometric idealisations emerge here as a consequence of the transitivity of the relation of CONTAINMENT (Section 3.3.4). The landmarks are objects included in the overall volume defined by the part of space (room) or environment (wood) (Herskovits 1986). In other words, the landmarks in Examples 17 and 18 display the geometric, functional, and topological properties of their respective wholes with the exception that their boundaries are vague and need to be mentally elaborated.

The landmark in Example 17 (the middle of the wood) differs from that in Example 18 as it is a part of a non-porous entity. Herskovits (1986) claims that the landmark of the relation of inclusion can be one of the many intrinsic regions into which the area is divided. Thus, it cannot be induced by terms of the kind, *side*, *right*, *half*. *Middle*, however, is an exception as

⁵⁵ Kovecses (1986) claims that strong emotions are structured by the metaphor *EMOTIONS ARE*

“[...] in the middle is used regardless of the properties of the object of which it is the middle.” (Herskovits 1986: 154)

I suggest that the CENTRE-PERIPHERY image schema motivates the combination *in the middle*. The closest synonyms to *middle* are *central* and *inside*. Thus, my assumption is that *middle* is conceptualised as the centre of the inside (of the container).

Example 19 (Schema XI) is the local prototype of Schema X (and IX) as it elaborates the landmark with respect to three functional properties protecting, storing and being filled.

4.3.6.3.2 Schema XII: displaying landmarks

The four examples subsumed under Schema XII are elaborations of Schema IX with respect to the functional properties of the landmark. However, they are extensions from Schema X as hiding is experientially prior to CONTAINMENT (Section 4.3.3). The examples are:

20. My foot is in the stirrup.
21. There are toys in the window.
22. He was standing in the doorway.
23. Who is the woman in that painting?

In Examples 20-22, the landmarks are geometrically construed as imaginary bounded spaces. In Examples 21-22, the geometric idealisation is motivated by the principle of the transitivity of CONTAINMENT. Windows and doors are “openings” partially bounded by the interior of the room. Being in the window or in the doorway thus implies being at the front of the container-interior. The front-back orientation is also imposed by our perception of the elements of the picture (Example 23). The 2DIM surface is viewed as having a foreground and a background.

The profiling in Examples 21-23 is motivated by the conceptual metaphor *BEING SALIENT IS BEING AT THE FRONT*. The metaphors *MEANS OF COMMUNICATION ARE CONTAINERS* and *CONVEYING MESSAGES IS SENDING* underlie the conceptualisation in Example 23. The painting is conceptualised as an artistic means for conveying the painter’s message. The

prominence of the trajector is the link between Schemas XII, XII A and the category IN-2 (Section 4.4).

4.3.6.4 Schema XIII: non-porous landmarks

The schema subsumes fifteen examples, which renders it almost as productive (prototypical) as Schema IV (Section 4.3.6.2). However, Hawkins suggests that

“[...] because the human being [...] functions and (sometimes) flourishes in a very porous medium (i.e., air), and because a large majority of physical objects with which the human being comes into contact also function in the same porous MEDIUM, [...] MEDIUM configurations with a very porous internal consistency have a certain primacy over (i.e., are more prototypical than) those with a more solid internal consistency.” (Hawkins 1985: 312)

Therefore, primacy has been given to porous mediums (Section 4.3.6.2.3). The schema subsumes bounded and non-bounded landmarks. The former will be discussed first.

4.3.6.4.1 Schema XIV: bounded landmarks

The schema subsumes fourteen examples, eleven of which are spatial:

24. The snake is in the grass.
25. The squirrel is in the tree.
26. I got stuck in a traffic jam.
27. Jersey is in the English Channel.
28. The kettle hangs in the fire.
29. He has got a ring in his ear.
30. The socket is in the wall.
31. The nails are in the board.
32. There is a hole in the road.
33. She takes milk in her coffee.
34. The gold is in the ore.

Examples 24-26 feature mediums geometrically defined as groups of solid objects (Section 4.2.3.1.3.2).⁵⁶ Thus, with reference to internal consistency, they are non- prototypical non-porous mediums. However, the MULTIPLEX TO

⁵⁶ Herskovits (1986) argues in favour of conceptualising the medium in Example 25 as an outline. I propose that the landmark be viewed as a collection of branches, thus motivating its geometric idealisation to a group of solid objects. My interpretation seems to have been confirmed by the results of Experiment 3, where the example was partially understood in terms of the MERGING schema (Section 3.4.4.1).

MASS image-schematic transformation justifies their membership in the category Schema XIV (Section 3.2.3).⁵⁷ Examples 27-32 profile a relation between an indeterminate trajector “embedded” in a medium landmark, which is geometrically defined as a volume (Examples 27-31) or a lamina (Example 32).⁵⁸ Although the relation is characterised by partial inclusion, the CONSTRAINT schema C1 is manifested (Section 4.2.3.2.1). The degree of prototypicality of the force dynamic schema is higher for dense mediums (ear, wall, board). Example 33 profiles a relation in which the particles of the trajector (milk) are understood to “merge” with the particles of the landmark (coffee) (Cuyckens 1993). Example 34 (Schema XV) is the local prototype for Schema XIII. It elaborates the landmark with respect to two functional attributes, hiding and protecting.

4.3.6.4.2 Schemas XIV A, XV A: metaphorical extensions

There are three metaphorical extensions from Schemas XIV and XV:

35. She is in the news.

36. Mary is in her twenties.

37. There is a pain in my back.

Examples 35-36 are extended from Schema XIV. The landmarks are conceptualised according to the MULTIPLEX TO MASS image-schematic transformation projected onto the domain of communication (Example 35) or time (Example 36).

Example 35 is motivated by the conceptual metaphors *MEANS OF COMMUNICATION ARE CONTAINERS* and *CONVEYING MESSAGES IS SENDING*, which emerged as an entailment of the conduit metaphor in Section 4.3.5.2. The news is conceptualised as a message broadcast (sent) through the air (conduit) to viewers. Example 36 is motivated by the metaphor *AGES ARE BOUNDED REGIONS OF SPACE*.

Example 37 is extended from the local prototype (Schema XV). The abstract trajector (pain) is located in the non-porous, bounded, hiding medium. The example is motivated by the metaphors *PARTS OF THE BODY ARE CONTAINERS FOR EMOTIONS* and *NEGATIVE EMOTIONS ARE*

⁵⁷ In the case of example 26, the schematic transformation is justified by the very definition of the landmark. *Jam is a crowded mass*.

⁵⁸ According to Herskovits (1986:42) the hole would be in the “normal” volume of the road - that is, within the part of space that the road would occupy if it had no hole.

CONSTRAINERS. In Section 3.4.4.1, the experimental results indicated that pain was perceived as a constrainer acting upon the trajector.

To sum up, the metaphorical mapping in Examples 35-37 highlights the following prototypical attributes of the CONTAINER schema:

- the functional potential of the landmark to carry (Example 35);
- its ability to hide (Example 37).

4.3.6.4.3 Schema XVI: non-bounded landmarks

Example 38 below elaborates the schema:

38. Fish swim in the water.

The active zone of the landmark (medium) is a 3DIM, non-porous, non-bounded volume which hides and protects the indeterminate trajector.

4.3.6.5 Schema XVII: 2DIM, bounded landmarks.

Four examples are subsumed under the schema:

39. The circle is drawn in a triangle.

40. We are in Scotland.

41. The camel is in the desert.

42. He lives in our neighbourhood.

The predicates in the above examples profile relations against a part of the domain of physical space which is geometrically defined as an area. However, there are constraints on what can be conceptualised as an area.

“ It is not sufficient that an object be geometrically two-dimensional; it must also be part of the surface divided into cells, so one can contrast inclusion in one cell with inclusion in another. [...] Geographical regions are sections of a divided surface, namely the ground.”

(Herskovits 1986: 46)

The landmarks in Examples 40-42 illustrate the transitivity of CONTAINMENT (Section 3.3.4). The inclusion of Schema XVII is motivated by the boundedness of mediums (Cuyckens 1993). Thus, the more delineated the medium, the more prototypical the relation. Consequently, Examples 41 and 42 are closest to the definition of the CONTAINER schema (Section 4.3.4).⁵⁹

4.3.6.6 Conclusions

Boers (1994: 46) states that the relative frequencies of occurrence of the distinct schemas in the primary domain will be taken as a first indication of their status in the radial category.

The schema IN-1 subsumes 42 of the 56 items under investigation. Thus, it is regarded as the central schema of the preposition *in* (Section 4.3.4). Consequently, the uses subsumed under the schema display the highest number of family resemblance features (Cuyckens 1993). The global prototype manifests all the twelve parameters of the CONTAINER schema (Section 4.3.6.2.3). As the schema's "motivating power" with respect to figurative extensions is another major criterion to decide on its status within the category, the fourteen figurative uses confirm the centrality of the IN-1 schema (Boers 1994). The abstract senses highlight the most salient parameters of the CONTAINER gestalt (Section 4.2.4.2).

The present conclusions are compatible with the experimental results from Section 3.4. Twenty-eight out of the forty-two uses of *in* subsumed under IN-1 were classified as members of the CONTAINER category. Moreover, ten out of the sixteen most prototypical examples subsumed under Schema V were identified as such in Experiment 3 (Section 3.4.4.1.1). Furthermore, the CONTAINER schema was provided as "a second best choice" in eleven of the twenty seven examples subsumed under the schemas for PART-WHOLE, MERGING, FORCE and PATH.

To sum up, the semantic analysis of the IN-1 category points to the centrality of that schema within the radial category *in*.

⁵⁹ The conceptualisation of countries as containers is reinforced by the following phrases *up and down the country* and *high country*.

4.3.7 The category IN-2

4.3.7.1 Introduction

The schematic structure of the category IN-2 is presented in Figure 2 below.

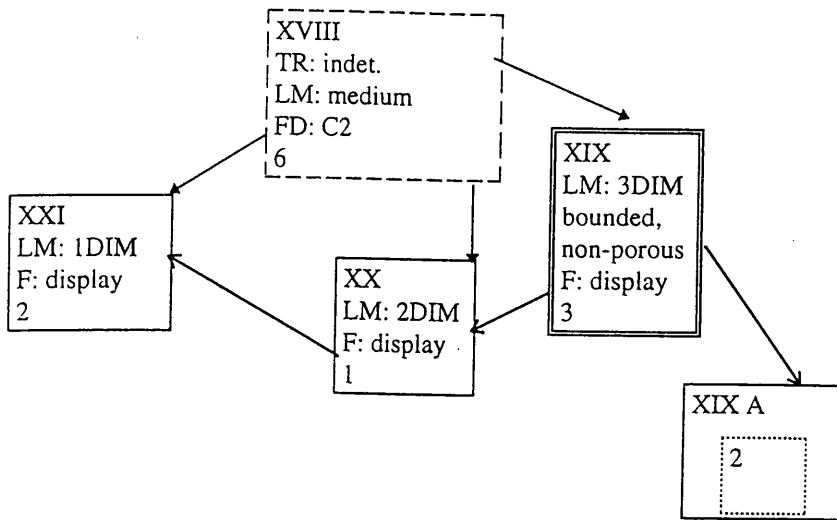


Figure 2. The schematic structure of the category IN-2

The category IN-2 subsumes six uses of *in* under five schemas. The superordinate schema (XVIII) specifies the e-sites for the medium LM and the indeterminate trajectory. The relation is defined by the C2 force dynamic schema for CONSTRAINT (Section 4.2.3.2.1). Consequently, the six trajectories are displayed by their respective landmarks.

Schema XIX is the local prototype which shares the features of three-dimensionality and boundedness with the category IN-1.

Schema XXI is the peripheral member of the category *in* as if fully instantiates the specifications of the superordinate schema. In other words, examples in Schema XXI are motivated by the PART-WHOLE image-schema and show featural overlap with the preposition *of* (Section 4.4). Schema XIX A subsumes “less literal” senses of the preposition *in* (Section 4.3.5.2).

Partial-headed arrows indicate diachronic extensions with respect to the landmark’s dimensionality as well as “more figurative” uses.

4.3.7.2 Schema XIX: the local prototype

There are three examples which profile predicates with 3DIM, non-porous, bounded landmarks:

43. I have been waiting in this queue for ages.
 44. One in ten people had problems with reading.
 45. The monument is in granite.

In the three examples above, the trajectors are indeterminate and figure prominently against their respective landmarks. In Example 43, the medium is geometrically elaborated by a group of solid objects, a part of which is the trajector (Section 4.2.3.1.3.2).

4.3.7.2.1 Schema XIX A: metaphorical extensions

Examples 44 and 45 above are the two metaphorical extensions from Schema XIX. The two examples are “more figurative” than Example 43 as they activate the domain of oriented physical space but are structured by conceptual metaphors.

In the case of Example 44, the conceptualisation is motivated by the metaphors *BEING SALIENT IS BEING AT THE FRONT* and *COGNITION IS PERCEPTION* (Section 4.3.5.2). The trajector is perceptually (and cognitively) foregrounded with respect to the landmark.

In the case of Example 45, the mapping is summarised by four conceptual metaphors: *BEING SALIENT IS BEING AT THE FRONT*, *MEANS OF COMMUNICATION ARE CONTAINERS*, *CONVEYING MESSAGES IS SENDING*, *PROCESSES ARE MOVEMENTS ALONG PATHS*. The process of creating a monument is conceptualised as movement along a terminative path (or a *PATH-FOCUS TO END-POINT FOCUS* image-schematic transformation). The sculptor is hammering the monument (foreground) out of granite (background), thus making it perceptually salient. Granite is a means through which he expresses his artistic message.

To sum up, the mapping highlights the following aspects of the source domain:

- the salience of the trajector against the landmark
(Examples 44 and 45);
- the prominence of the *PATH* schema resulting from the carrying function of the landmark (Example 45).

The resulting topology is unprototypical for the preposition *in* (Section 4.3.4).

4.3.7.3 Schema XX: the 2DIM landmark

The schema subsumes one spatial use of *in*:

46. There is a gold thread in the carpet.

The predicate profiles a relation against the domain of oriented physical space between a 2DIM, bounded lamina medium and a point-like trajector.

4.3.7.4 Schema XXI: 1DIM landmarks

The schema subsumes two instances, whose trajectors can be described as “geometric accidents” (Herskovits 1986: 52):

47. The dip in the graph is very significant.

48. There is a curve in the road.

The predicates are the central instantiations of the CONSTRAINT schema C2. The movement of the trajectors preceding the relations is undetectable and their prominence in the respective profiles very high (Section 4.2.3.2.1).

4.3.7.5 Conclusions

The category IN-2 is related to the central schema IN-1 via Schema XIX. It is thus a peripheral member of the *in* category as well as a poor instantiation of the *of* schema. Schema XXI elaborates the parameters of the PART-WHOLE schema to a greater degree, manifesting a more significant overlap with the category *of* (Section 3.4.2.1).

The present conclusions can be related to the experimental results discussed in Section 3.4.4.

Four of the six examples subsumed under IN-2 were classified as instances of the PART-WHOLE schema. Those that constitute the local prototype (Schema XIX) were given higher ratings (*One in ten people had problems with reading* 10, *I have been waiting in this queue for ages* 8) than the marginal members of the *in* category (Schema XXI). The remaining eight examples subsumed under the PART-WHOLE schema in Section 3.4.4.1.2 showed an image-schematic overlap with the CONTAINER schema (six instances) and the PATH schema (two examples).

4.3.8 The category IN-3

4.3.8.1. Introduction

The schematic structure of the category IN-3 is presented in Figure 3 below.

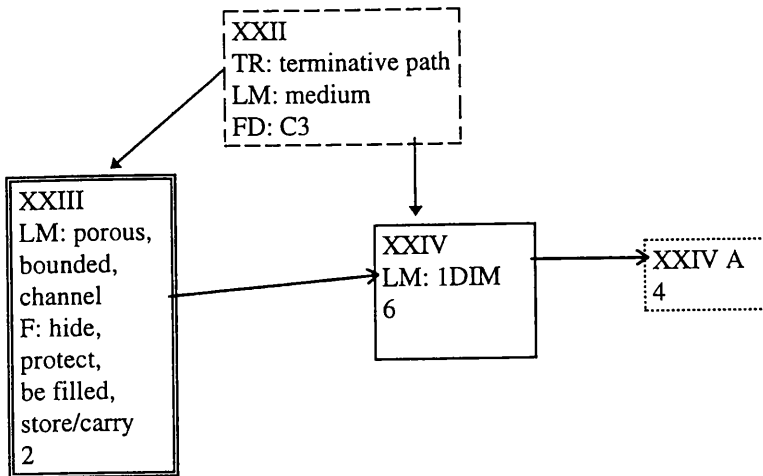


Figure 3. The schematic structure of the category IN-3

The category IN-3 consists of four schemas which subsume eight uses of *in*. The superordinate Schema XXII defines the category as a relation between a medium landmark and a terminative path trajectory. The force dynamic schema is that of C3 (Section 4.2.3.2.1). The category is motivated by the CONTAINER gestalt as well as the PATH image-schema. The prominence of the PATH schema causes all predicates, to a lesser or greater extent, to be structured metaphorically (Section 4.3.5.2).

The prototype of the category (Schema XXIII) is connected to the schema IN-1 via the features of the landmark: three-dimensionality, porosity, boundedness, hiding, being filled and carrying or storing. It is related to the PATH schema via the configuration of the trajectory.

Schema XXIV is the peripheral member of the category *in*, whose four metaphorical extensions are subsumed by Schema XXIV A. It is extended from Schema XXIII with respect to the properties of the landmark.

4.3.8.2 Schema XXIII: the local prototype

Schema XXIII subsumes two uses of *in*:

49. Get in the car.

50. Put the butter in the fridge.

The predicates profile a relation of COINCIDENCE between an indeterminate trajector and a medium landmark. The PATH figures prominently in the base motivating the structuring of the relations by means of the conceptual metaphor *ACTIONS ARE SELF-PROPELLED MOVEMENTS ALONG PATHS* (Section 4.3.5.2).

4.3.8.3 Schema XXIV: 0DIM landmarks

The schema subsumes two elaborations profiled against the domain of oriented physical space:

51. The sun is in my face.

52. He was shot in the head.

The mediums are conceptualised as points which coincide with the end-points of the PATH trajectors. In Example 51, the trajector (sun) is represented metonymically by its rays, which are conceptualised as paths. In Example 52, the mapping is summarised by the metaphor *ACTIONS ARE SELF-PROPELLED MOVEMENTS ALONG PATHS*.

4.3.8.3.1 Schema XXIV A: metaphorical extensions

There are four metaphorical extensions from Schema XXIV:

53. In refusing to go abroad, he missed his chance.

54. He is doing a degree in philosophy.

55. Dinner will be ready in ten minutes.

56. We are leaving in April.

In Example 53, the predicate activates the domain of communication (Section 4.3.5.1). The action of refusing is structured by the metaphor *ACTIONS ARE SELF-PROPELLED MOVEMENTS ALONG PATHS*. The PATH is conceptualised as a conduit according to the metaphor *CONVEYING MESSAGES IS SENDING*. The PATH-FOCUS TO END-POINT FOCUS image-schematic transformation motivates the conceptualisation of the result of the action as a destination. The result of the utterance prevents the subjects (he) from performing the action of going abroad. Thus, the result of his linguistic action acts as a constrainer upon the activity of the subject. The metaphors *RESULTS ARE DESTINATIONS* and *RESULTS ARE CONSTRAINERS* summarise the mapping (Section 4.3.5.2).

In Example 54, the activity of doing a degree is conceptualised as following a course of study in the area of philosophy, the result of which is obtaining a degree. Thus, the predicate is structured by the metaphors: *ACTIONS ARE SELF-PROPELLED MOVEMENTS ALONG PATHS*, *PURPOSES ARE DESTINATIONS*, *MEANS ARE PATHS TO DESTINATIONS* and *SUBJECTS (OF STUDY) ARE AREAS*.

Examples 55 and 56 are deictic predicates which activate the domain of time and involve the first type of subjectification (Section 2.2.5). The conceptualisation entails the potential terminative path proceeding from the observer to the trajector along the stationary time according to the metaphor *TIME IS A PATH AND WE MOVE ALONG IT* (Lakoff and Johnson 1980).

In Example 55, both the configurations in the relational profile are indeterminate. The process of preparing the meal is conceptualised as proceeding along a path in the area of time. The end of the process coincides with the point on the temporal path. The mapping is summarised by the metaphors *PERIODS OF TIME ARE BOUNDED REGIONS OF SPACE*, *PROCESSES ARE MOVEMENTS ALONG PATHS* and the *PATH-FOCUS TO END-POINT FOCUS* image-schematic transformation.

In Example 56, the landmark is conceptualised as a bounded region resulting from the intrinsic division of the area (Section 4.2.3.1.3.2). In other words, months are understood as intrinsic parts of the year. The mapping is summarised by the metaphor *PERIODS OF TIME ARE BOUNDED REGIONS OF SPACE* and the *PATH-FOCUS TO END-POINT FOCUS* image-schematic transformation.

To sum up, the topology of the target domain highlights the following aspects of the source domain:

- the boundedness of the landmark;
- the carrying function of the landmark (Example 53);
- the salience of the *PATH* in the base.

The topology of the target domain suggests that the category *IN-3* is less prototypical than *IN-1*.

4.3.8.4 Conclusions

Cuyckens claims that

”[...] the set of path-uses of *in* as a whole is transformationally linked to its non-path uses through metonymy. As Taylor (1989: 127) points out, there is a natural, metonymic relationship between the path followed by a moving entity and one of the infinite number of points located on the path.” (Cuyckens 1993: 64)

In other words, there is an experiential motivation for the link between the categories IN-1 and IN-3. The connection between them is summarised by the fact that the final configuration of C3 is identical to that of C1 (Section 4.2.3.2.1). Thus, Schema XXIII in Figure 3 above subsumes the peripheral uses of *in*, which are the central uses of *into*. Schema XXIV includes examples which are peripheral for both prepositions and show some featural overlap with the preposition *to*.

The experimental results in Section 3.4.4 confirm the connection between the schemas. Four of the eight examples subsumed under the schema IN-3 were classified as members of the PATH schema in Section 3.4.4.1.5. Two of the other uses placed in the PATH category were co-motivated by the CONTAINER schema (*He spoke in Russian, Mary is in her twenties*), one (*The dip in the graph is very significant*) by the PART-WHOLE schema.

4.3.9 Summary

In Section 4.3, the category structure of the prepositional predicate *in* has been presented. Three senses of the preposition, motivated by the image-schematic profiles for CONTAINER, PART-WHOLE and FULL-EMPTY, have been distinguished (Section 3.4). Each sense has been presented as a category of schemas distributed at different levels of abstraction (Section 2.2.6). Central and peripheral members have been distinguished for each set.

4.4 The concluding remarks

4.4.1 Introduction

In Section 4.4.2, previous definitions of the preposition *in* will be presented. In Section 4.4.3, I will offer my definition of the prepositional predicate.

4.4.2 Previous definitions of the spatial preposition *in*

4.4.2.1 Non-cognitive approaches

According to the core sense approach, the meaning of a polysemous lexical item was sufficiently defined by its most abstract features (Section 2.4.3.1). In the case of the preposition *in*, the traditional definitions concentrated on the dimensionality of the relatum.

Bennett (1975) and Cooper (1968) define *in* as a relation between *x* and the interior of *y*. Clark (1973) and Quirk and Greenbaum (1973) claim that *in* lexicalizes a COINCIDENCE relation between *x* and *y*. Clark defines *y* as a 3DIM entity; Quirk and Greenbaum as a 3DIM volume or a 2DIM area.

According to Leech,

“*In* expresses the concept of enclosure or containment as applied either to two-dimensional or three-dimensional locations.” (Leech 1969: 162)

Miller and Johnson-Laird propose the following definition:

“IN (*x*, *y*): A referent *x* is in a relatum *y* if [...] [PART (*X*, *Z*) & INCLUDE (*Z*,*Y*)].” (Miller 1976: 385)

4.4.2.2 Cognitive approaches

In Cognitive Linguistics, the preposition *in* has been defined in a gestalt-like manner. The properties of the arguments and the characteristics of the relation have been considered.

Cuyckens defines *in* as

“[...] a relation of COINCIDENCE between *x* and the spatial configuration medium.” (Cuyckens 1993: 41)

Herskovits (1986: 46) defines the ideal meaning of *in* by means of a relation of inclusion and geometric conceptualisations of the arguments (Section 2.4.3.2.4).

Vandeloise (1991: 225) describes the preposition as a functional relation container/contained (Section 2.4.3.2.5).

It is worth noting that all the definitions of *in* presented above account only for the spatial uses of the preposition.

4.4.3 The definition of the preposition *in* - a proposal

The results of the three experiments summarised in Section 3.5 as well as the conclusions emerging from the case study in Section 4.3 suggest that the preposition *in* be defined as a radial category of 31 schemas subsuming the 56 uses of the prepositional predicate. The 31 schemas comprise the three senses of the preposition (IN-1, IN-2 and IN-3). The senses are partially motivated by the image schemas for CONTAINER, PART-WHOLE and PATH. They are interrelated via different sets of family resemblance features. The IN-1 schema is taken as the prototypical sense of *in*. Thus, it metonymically represents the meaning of the prepositional predicate *in* (Section 2.3.6.3.1). The global prototype is subsumed by Schema VII (Section 4.3.6.2.3). In other words, the meaning of the preposition *in* can be represented as a semantic category comprising Figures 1, 2 and 3 above. As each of the diagrams has already been extensively discussed, some important links between them will now be presented in order to highlight the unity of the concept *in*.

4.4.3.1 Links among superordinate schemas

The relations among the three senses of the preposition *in* at the highest level of abstraction are presented in Figure 4 below.

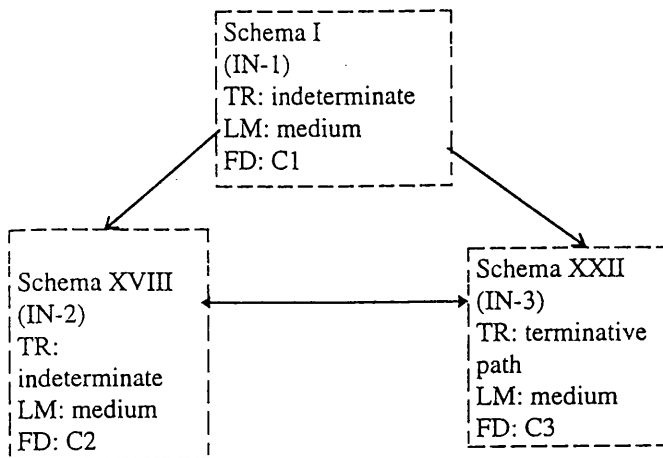


Figure 4. Links among the three superordinate schemas of the preposition *in*

In Figure 4 above, Schemas XVIII and XXII are extended from Schema I. The differences are summarised by the parameters of the respective realisations of the CONSTRAINT schema (Section 4.2.3.2.1).

Schema XVIII differs from Schema I with respect to the prominence of the PATH in the relation; Schema XXII departs from Schema I along two parameters, namely the prominence of the potential movement of the trajector preceding the relation and the degree to which the trajector is displayed by/against the landmark. Schemas XVIII and XXII are related to each other via similarity links symbolised by an arrow headed at both ends (Brugman 1981).

To sum up, the superordinate schemas for the three senses define prepositional polysemy at the highest level of abstraction (Section 4.3.2). The three schemas are likely to be subsumed by an even higher-order superschema (Lindner 1982).

4.3.2.2 Links among prototypical schemas

Figure 5 below represents links among four local and one global prototype of the category *in*.

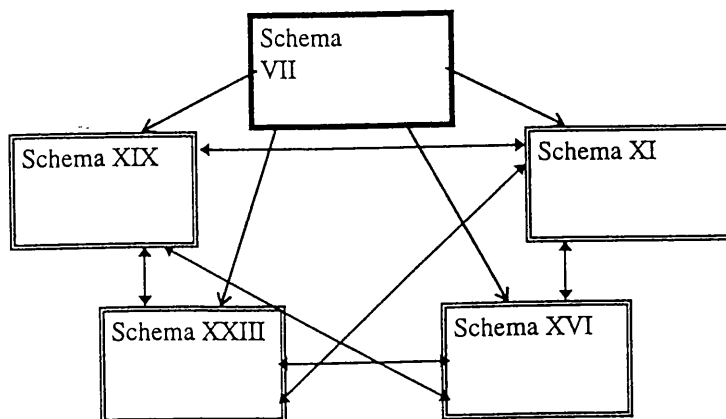


Figure 5. Links among the five prototypical schemas of the preposition *in*

In Figure 5 above, the links among the four local prototypes are those of similarity. They are extended from the global prototype (Schema VII). The differences are marked along three continua:

- the geometrical properties of the landmark
- and the trajector (Section 4.2.3.1.3.2);
- the functional features of the landmark (Section 4.2.3.1.3).

The five prototypical schemas define the category *in* at the basic level of abstraction.

4.4.3.3 Links among peripheral schemas

The two peripheral schemas of the category IN-1 (XII and XVII) are related to the category IN-2 via the functional feature of displaying. The third peripheral Schema VIII forms a transformational link to the category IN-3 via the PATH image schema. The peripheral Schema XXI shows an image-schematic overlap with that of the preposition *to* (Section 4.3.8.4). The non-central Schema XXIV shares an image-schematic profile with the preposition *of* (Section 4.3.7.5).

4.4.4 Summary

To sum up, I propose a definition of the preposition *in* which relies for its meaning on the image-schematic profiles of individual predicates (Section 3.4). The conceptual structure manifests various levels of abstraction, with prototypes as metonymic members of categories. Individual uses are combined along different dimensions to form a family resemblance structure (Section 2.2.6). Peripheral members feature the fewest number of prototypical features (Section 4.3.4) and share some characteristics with other prepositions (*into, to, of*).

In comparison with the previous definitions of *in*, the category structure I suggest can account for spatial as well as abstract uses of the preposition. Moreover, it points to the different relations that the CONTAINER schema involves, among them containment, inclusion, differentiation, separation and choosing (Section 3.3.4).

Boundedness is the most superordinate of the concepts that *in* encompasses. At the same time, it is one the most relevant for human existence:

“ Man exists in this world and, in all primary experiences, the world is characterised by human existence. [...] Man’s direct experience is at first restricted to his ‘situation’ in space and time. The word ‘horizon’ offers itself as conveying this limitation.”(Verhaar 1963: 26)

The very nature of those concepts presupposes that the category *in* is structured as a continuum, contrasting hiding and displaying on the one hand, lack of motion and movement on the other. As a closed-class member, *in* highlights those relations by means of image-schematic overlaps. The basic patterns thus obtained can be applied to the analysis of verbs and other open-class members (Talmy 1988).

R E F E R E N C E S

Bennett D. C. (1975) *Spatial and temporal uses of English prepositions: An essay in stratificational semantics*. Longman, London.

Boers F. (1994) *Motivating meaning extensions beyond physical space*. Ph.D. diss., University of Antwerp (UIA).

Brugman C. (1981) *Story of over*. M.A. thesis, University of California, Berkeley.

Caramazza A., Goyer E. (1976) " Polysemy and the structure of the subjective lexicon." In: *Georgetown University round table on languages and linguistics*. Georgetown University Press, Washington D.C.

Clark H. (1973) " Space, time, semantics and the child." In: *Cognitive development and the acquisition of language*. Moore T.E. (ed.), Academic Press, New York.

Cooper G. (1968) *A semantic analysis of English locative prepositions*. Bolt Beranek and Newman report, no.1587.

Cuyckens H. (1991) *The semantics of spatial prepositions: A cognitive-linguistic exercise*. Ph.D. diss., University of Antwerp (UIA).

Cuyckens H. (1993) " The Dutch spatial preposition *in*." In: *The Semantics of Prepositions*. Zelinsky-Wibbelt C. (ed.), Mouton de Gruyter, Berlin; New York.

Geeraerts D. (1988) " Where does prototypicality come from?" In: *Topics in cognitive linguistics*. Rudzka-Ostyn B. (ed.), J. Benjamins, Amsterdam; Philadelphia.

Geeraerts D. (1992) " Prototypicality effects in diachronic semantics: a round-up." In: *Diachrony within Synchrony: Language History and Cognition*. Kellermann G., Morrissey M.D (edd.), Peter Lang, Frankfurt-on-Main.

Gibbs R., Beitel D. (1994) " Taking a Stand on the Meaning of *Stand*: Bodily Experience as Motivation for Polysemy." In: *Journal of Semantics*, 11: 231-251.

Gibbs R., Colston H. (1995) " The cognitive psychological reality of image schemas and their transformations." In: *Cognitive Linguistics*, 6-4: 347-379.

Geiger D., Rudzka-Ostyn B. (edd.) (1993) *Conceptualisation and mental processing in language*. Mouton de Gruyter, Berlin; New York.

Goosens L. (1990) " Metaphtonymy: the interaction of metaphor and metonymy in expressions for linguistic action." In: *Cognitive Linguistics*, 1-3: 323-40.

Guralnik D.B. (ed.) (1986) *Webster's New World Dictionary*. Simon and Schuster, New York.

Hawkins B. (1985) " The semantics of English spatial prepositions." L.A.U.D. paper no. 142, Duisburg.

Herskovits A. (1986) *Language and spatial cognition: An interdisciplinary study of the prepositions in English*. Cambridge University Press, Cambridge.

Jackendoff R. (1983) *Semantics and cognition*. MIT Press, Cambridge, MA.

Johnson, M. (1987) *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*. The University of Chicago Press, Chicago.

Johnson, M. (1991) " Knowing through the Body." In: *Philosophical Psychology*, 4: 3-18.

Kellermann G., Morrissey M.D. (edd.) (1992) *Diachrony within Synchrony: Language History and Cognition*. Peter Lang, Frankfurt-on-Main.

- Kovecses Z. (1986) *Metaphors of Anger, Pride, and Love: A Lexical Approach to the Structure of Concepts*. J. Benjamins, Philadelphia; Amsterdam.
- Lakoff G. and Johnson M. (1980) *Metaphors we live by*. University of Chicago Press, Chicago.
- Lakoff G. (1987) *Women, fire, and dangerous things: What categories reveal about the mind*. University of Chicago Press, Chicago.
- Lakoff G. and Turner M. (1989) *More than cool reason: A field study in poetic metaphor*. University of Chicago Press, Chicago.
- Lakoff G. (1990) "The Invariance Hypothesis: Is Abstract Reason Based on Image Schemas?" In: *Cognitive Linguistics*, 1: 39-74.
- Lakoff G. (1993) "Contemporary Theory of Metaphor." In: *Metaphor and Thought*. Ortony A. (ed.) Cambridge University Press, New York.
- Langacker R.W. (1987) *Foundations of cognitive grammar. Vol.1: Theoretical prerequisites*. Stanford University Press, Stanford.
- Langacker R. (1988) "A Usage-Based Model." In: *Topics in cognitive linguistics*. Rudzka-Ostyn B. (ed.), J. Benjamins, Amsterdam; Philadelphia.
- Langacker R.W. (1991) *Foundations of cognitive grammar. Vol.2: Descriptive application*. Stanford University Press, Stanford.
- Langacker R.W. (1993) "Reference-point constructions." In: *Cognitive Linguistics*, 4: 1-38.
- Leech G.N. (1969) *Towards a semantic description of English*. Longman, London.
- Lindner S. (1982) *A lexico-semantic analysis of verb-particle constructions with up and out*. Ph.D. thesis, University of California, San Diego.

Lyons J. (1977) *Semantics*. Cambridge University Press, Cambridge.

Maciejczak M. (1995) *Świat według ciała w 'Fenomenologii Percepcji'*
M. Merleau-Ponty 'ego. Wydawnictwo Comer, Warszawa.

Miller G.A., Johnson-Laird P.N. (1976) *Language and perception*. Cambridge University Press, Cambridge.

Moore, T.E. (ed.) (1973) *Cognitive development and the acquisition of language*. Academic Press, New York.

Ortony A. (ed.) (1979) *Metaphor and Thought*. Cambridge University Press, Cambridge.

Ortony A. (ed.) (1993) *Metaphor and Thought*. Cambridge University Press, Cambridge.

H. Pick and L. Acredolo (edd.) (1983) *Spatial Orientation: Theory, Research and Application*. Plenum Press, New York.

Quirk R., Greenbaum S., Leech G. & Svartvik (1985) *A comprehensive grammar of the English language*. Longman, London.

Reddy M. (1979) "The Conduit Metaphor." In: *Metaphor and Thought*. Ortony, A. (ed.), Cambridge University Press, Cambridge.

Rosch E. (1973) "On the internal structure of perceptual and semantic categories." In: *Cognitive development and the acquisition of language*. Moore T.E. (ed.), Academic Press, New York.

Rosch E. (1978) "Principles of categorisation." In: *Cognition and categorisation*.
Rosch E., Lloyd B.B. (edd.), Lawrence Erlbaum, Hillsdale.

Rosch E., Lloyd B.B. (edd.) (1978) *Cognition and categorisation*. Lawrence Erlbaum, Hillsdale.

Rudzka-Ostyn B. (ed.) (1988) *Topics in cognitive linguistics*. J. Benjamins, Amsterdam; Philadelphia.

Saeed J. (1997) *Semantics*. Blackwell Publishers, Oxford.

Sweetser E. (1990) *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Change*. Cambridge University Press, Cambridge.

Talmy L. (1983) "How language structures space?" In: *Spatial Orientation: Theory, Research and Application*. H. Pick and L. Acredolo (edd.), Plenum Press, New York.

Talmy L. (1988) "Force Dynamics in Language and Cognition." In: *Cognitive Science*, 12: 49-100.

Tatarkiewicz W. *Historia filozofii*. Tom: 1-3. Wydawnictwo Naukowe PWN, Warszawa.

Taylor J. (1989) *Linguistic categorisation: Prototypes in linguistic theory*. Clarendon Press, Oxford.

Turner M. (1993) "An image-schematic constraint on metaphor." In: *Conceptualisation and mental processing in language*. Geiger D., Rudzka-Ostyn B. (edd.), Mouton de Gruyter, Berlin; New York.

Vandeloise C. (1984) *Description of space in French*. Doctoral Dissertation, L.A.U.D. University of California, San Diego.

Vandeloise C. (1991) *Spatial Prepositions: A case study in French*. The University of Chicago Press, Chicago; London.

Verhaar J. (1963) *Some Relations Between Perception, Speech and Thought*. Van Gorcum and Comp. N.V., Assen.

Zelinsky-Wibbelt C. (ed.) (1993) *The Semantics of Prepositions*. Mouton de Gruyter, Berlin; New York.

