

**POLYSEMY AND METAPHOR IN PERCEPTION
VERBS: A CROSS-LINGUISTIC STUDY**

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DECLARATION OF ORIGINALITY

I hereby declare that this thesis and the work reported herein was composed and originated entirely by myself, in the Department of Theoretical and Applied Linguistics at the University of Edinburgh.

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ABSTRACT

This thesis is a cognitive semantic account of polysemy in the semantic field of perception verbs in English, Basque and Spanish. It explores why and how our experience and understanding of the five senses constrains and shapes the way in which we create mappings between the physical domain of perception onto more metaphorical and abstract conceptual domains of experience. The different extensions of meaning in these verbs, both synchronically and diachronically, have not taken place as a result of chance, but are grounded in our own conceptualisation of these sense modalities. Secondly, the thesis focuses on how the polysemy in these verbs is obtained, whether it is localised to only these perception verbs or whether it affects the elements that complement these verbs in a sentence.

Chapter 1 sets out the nature and scope of the work, explaining the purpose of examining the domain of perception verbs, and outlining the theoretical context and orientation of the study. Chapter 2 presents a synchronic typological study of the different meanings, both physical and metaphorical, found in perception verbs in English, Basque and Spanish. Chapter 3 is a brief diachronic-etymological account of these perception verbs in these three languages. Chapter 4 reviews two approaches to meaning extension: Sweetser's (1990) semantic account of perception verbs, and Pustejovsky's (1995) Generative Lexicon. It sets out the advantages and gaps that need to be addressed in both approaches. Chapter 5 describes the physiology of the five senses and the way in which human beings perceive these perceptual processes. It presents a typology of the properties that characterise the source domain of sense perception. Chapter 6 introduces the processes called 'Property Selection', which constrain the mappings between the source and the target domain, both in metaphorical and physical extended meanings. Chapter 7 explores the question of how the polysemous senses of perception verbs are obtained, whether they are the result of the meaning of the perception verb only, or the result of the interaction between the semantics of that verb and the other elements that co-occur in the same sentence. It also explains the implications for the study of cross-linguistic polysemy.

Chapter 8 draws some conclusions on the issues discussed in this thesis and points out further lines for future research.

Key words: cognitive semantics, polysemy, metaphor, perception verbs, property selection processes, cross-linguistic.

*Aita,
Ama,
ta
hartzatxo arrosarentzat.
Bihotz bihotzez.*

TABLE OF CONTENTS

ABSTRACT.....	3
ACKNOWLEDGEMENTS	10
LIST OF ABBREVIATIONS	12
CHAPTER 1: INTRODUCTION: WHAT IS POLYSEMY?	16
1.1. THEORETICAL FRAMEWORK: COGNITIVE LINGUISTICS	17
1.1.1. <i>MAIN TENETS IN COGNITIVE LINGUISTICS.....</i>	19
1.1.2. <i>METHODOLOGICAL PRINCIPLES.....</i>	20
1.1.3. <i>SUMMARY.....</i>	28
1.2. THE STATE OF THE ART IN POLYSEMY	28
1.2.1. <i>TRADITIONAL APPROACHES TO POLYSEMY: WHAT IS POLYSEMY? WHAT IS HOMONYMY?</i>	29
1.2.2. <i>COGNITIVE SEMANTICS.....</i>	35
1.2.3. <i>LEXICAL SEMANTICS AND THE GENERATIVE LEXICON.....</i>	38
1.2.4. <i>SUMMARY.....</i>	41
1.3. ORGANISATION OF THE THESIS.....	42
CHAPTER 2: THE SEMANTIC FIELD OF SENSE PERCEPTION	44
2.1. SOURCES OF THE LANGUAGE MATERIAL	44
2.2. PHYSICAL MEANINGS IN PERCEPTION VERBS	45
2.2.1. <i>SEMANTIC CLASSIFICATIONS OF PERCEPTION VERBS</i>	45
2.2.2. <i>CROSS-LINGUISTIC DATA: BASQUE AND SPANISH</i>	49
2.2.2.1. <i>Basque Perception Verbs.....</i>	49

2.2.2.2. Spanish Perception Verbs	53
2.2.3. <i>SUMMARY</i>	56
2.3. NON-PROTYPICAL MEANINGS IN PERCEPTION VERBS.....	56
2.3.1. <i>VISION</i>	58
2.3.2. <i>HEARING</i>	67
2.3.3. <i>TOUCH</i>	71
2.3.4. <i>SMELL</i>	80
2.3.5. <i>TASTE</i>	85
2.3.5.1 The nouns of the sense of taste	90
2.3.6. <i>SUMMARY</i>	91
2.4. CONCLUSIONS.....	92

CHAPTER 3: THE ETYMOLOGY OF PERCEPTION VERBS... 94

3.1. <i>VISION</i>	96
3.2. <i>HEARING</i>	98
3.3. <i>TOUCH</i>	100
3.4. <i>SMELL</i>	102
3.5. <i>TASTE</i>	105
3.6. <i>CONCLUSIONS</i>	109

CHAPTER 4: PROBLEMS IN POLYSEMY..... 111

4.1. SWEETSER'S MIND-AS-BODY CONCEPTUAL METAPHOR.....	112
4.1.1. <i>DISCUSSION</i>	118
4.2. PUSTEJOVSKY'S GENERATIVE LEXICON.....	122
4.2.1. <i>DISCUSSION</i>	126
4.3. <i>CONCLUSIONS</i>	132

CHAPTER 5: PERCEPTION, THE SENSES AND OUR LANGUAGE..... 135

5.1. PERCEPTION AND THE SENSES	135
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5.1.1. <i>PHYSIOLOGY OF THE SENSES</i>	136
5.1.1.1. Vision	137
5.1.1.2. Hearing	141
5.1.1.3. Touch.....	143
5.1.1.4. Smell	144
5.1.1.5. Taste	146
5.1.2. <i>SUMMARY</i>	147
5.2. PROPERTIES IN SENSE PERCEPTION.....	147
5.2.1. <i>TYPOLGY OF 1ST ORDER PROPERTIES</i>	148
5.2.2. <i>SUMMARY</i>	155
5.2.3. <i>TYPOLGY OF 2ND ORDER PROPERTIES</i>	157
5.2.4. <i>SUMMARY</i>	161
5.3. PROPERTIES VS. SEMANTIC FEATURES.....	162
5.4. CONCLUSIONS.....	164
CHAPTER 6: PROPERTY SELECTION PROCESSES.	166
6.1. PERCEPTION AND LANGUAGE	166
6.1.1. <i>THE PROPERTY <CORRECTION OF HYPOTHESIS></i>	167
6.1.2. <i>THE PROPERTY <CONTACT></i>	168
6.1.3. <i>SUMMARY</i>	169
6.2. PROPERTY SELECTION PROCESSES IN TOUCH AND SMELL....	169
6.2.1. <i>METAPHORICAL CONSTRAINTS: THE INVARIANCE PRINCIPLE</i>	171
6.2.2. <i>PROPERTY SELECTION PROCESSES IN TOUCH</i>	173
6.2.3. <i>PROPERTY SELECTION PROCESSES IN SMELL</i>	177
6.3. CONCLUSIONS.....	180
CHAPTER 7: CONSTRAINTS ON POLYSEMY	183
7.1. INTRODUCTION.....	184
7.1.1. <i>BRUGMAN'S ANALYSIS OF OVER</i>	184
7.1.2. <i>CROSS-LINGUISTIC POLYSEMY</i>	189
7.1.3. <i>SUMMARY</i>	193

7.2. TACTILE AND OLFACTORY POLYSEMY: AN ALTERNATIVE APPROACH.....	193
7.2.1. <i>GRADUABLE POLYSEMY</i>	194
7.2.2. <i>VERB-PROPERTY REQUIREMENT</i>	199
7.2.3. <i>SUMMARY</i>	202
7.3. HOW UNIVERSAL IS POLYSEMY?.....	203
7.4. CONCLUSIONS.....	213
CHAPTER 8: CONCLUSIONS	215
8.1. A NEW MODEL FOR POLYSEMY	215
8.2. POSSIBLE DIRECTIONS FOR FURTHER RESEARCH	219
BIBLIOGRAPHY	220
GENERAL BIBLIOGRAPHY	220
DICTIONARIES	236
<i>BASQUE</i>	236
<i>ENGLISH</i>	237
<i>SPANISH</i>	238
<i>LATIN</i>	239
<i>MISCELANEOUS</i>	239

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LIST OF ABBREVIATIONS

1	First Person
2	Second Person
3	Third Person
ABL	Ablative
ABS	Absolutive
ACC	Accusative
ADN	Adnominal suffix
ALL	Allative
AM	<i>The American Heritage Dictionary</i>
AMGD	<i>Advanced Memphis General Dictionary</i>
AR	<i>Diccionario Retana de Autoridades del Euskera</i>
AUX	Auxiliary
AZ	<i>Azkue's Diccionario Vasco-Español-Francés</i>
BEN	Benefactive
BN	<i>Bera Lopez's Diccionario Vasco Castellano</i>
BQ	Basque
CL GK	Classical Greek
CMT	Comitative
COL	<i>Collins English Dictionary and Thesaurus</i>
COMP	Complementiser
CREA	Reference Corpus for Present-day Spanish
CSE	<i>Collins Spanish-English-Spanish Dictionary</i>
DAN	Danish
DAT	Dative
DCECH	<i>Diccionario Crítico Etimológico Castellano e Hispano</i>
DU	Dutch
EM	<i>Ernout & Meillet's Dictionnaire Etymologique de la Langue Latine</i>
ENG	English

EEBS	Present-day Basque Reference Corpus
ELH	<i>Elhuyar Euskara-Castelania / Castellano-Vasco Hiztegia</i>
FR	French
FUT	Future
ERG	Ergative
G	German
GALW	Aulestia & White's <i>Euskara-Ingelesa / Ingelesa-Euskara Hiztegia</i>
GEN	Genitive
GER	Germanic
GK	Greek
HAB	Habitual aspect
HM	<i>Diccionario Hiru Mila Hiztegia</i>
ICM	Idealised Cognitive Model
IE	Indo-European
IH (IP)	Invariance Hypothesis (Invariance Principle)
IMP	Imperative
INE	Inessive
INSTR	Instrumental
IT	Italian
IRR	Irrealis
IS	Sarasola's <i>Hauta-Lanerako Euskal Hiztegia</i>
LAR	<i>Diccionario Moderno Larousse Español-Inglés</i>
LAT	Latin
LMD	Michelena's <i>Diccionario General Vasco. Orotariko Euskal Hiztegia</i>
LM	Landmark
MDU	Middle Dutch
ME	Middle English
MLG	Middle Low German
MM	Moliner's <i>Diccionario del Uso del Español</i>
MSP	Middle Spanish
NEG	Negative particle

NM	Nominalised verb
OE	Old English
OED	<i>Oxford English Dictionary</i>
OFR	Old French
OHG	Old High German
OLD	<i>Oxford Latin Dictionary</i>
OLG	Old Low German
OP	Object Perceived
OSD	<i>Oxford Spanish Dictionary</i>
OSP	Old Spanish
OTEUT	Old Teutonic
P	Perception
PAR	Participle
PART	Partitive
PL	Plural
PR	Perceiver
PSP	Property Selection Processes
RAE	<i>Diccionario de la Real Academia Española de la Lengua</i>
RCD	<i>Richmont Compact Dictionary</i>
REC	Reciprocal
REFL	Reflexive
REL	Relative
RUM	Rumanian
SG	Singular
SKT	Sanskrit
SP	Spanish
SUBJ	Subjunctive
TR	Trayector

“Ihkusteaz, mintzatzeaz, entzuteaz eta usnatzeaz egiten da bekhatu, ez ordea ukitzeaz bezala” (Axular 3 227-26)

“Por mis sentidos, que son puentes levadizos tendidos a este mundo, sé que no estoy sola ni lo estuve. Todos vivimos y respiramos el flujo y el reflujo del mundo natural: el ritmo de las estaciones, los sonidos, olores, tactos, retozos de la luz... Percibimos el sabor de los alimentos y el abrazo del amado, nuestra vitalidad y la tierra bajo los pies”(A. Gala *Las afueras de Dios*)

“God! This woman sees more with her nose than she does with her eyes. That's because she's blind with love, Sir” (Plautus *Miles Gloriosus*)

CHAPTER 1: INTRODUCTION: WHAT IS POLYSEMY?

Polysemy is the term used in semantic analysis to describe the situation in which a word has two or more related meanings. No matter how simple this definition seems to be, polysemy is not a clear-cut concept. For decades, linguists from different schools have been trying to give a sound account of what polysemy is and how it can be accounted for (see Section 1.2). Unfortunately, it is still true that polysemy remains a somehow muddy field in linguistic research.

The main purpose behind the present study is the analysis of the polysemy that exists in perception verbs in English, Basque and Spanish. Perception verbs in these languages not only convey meanings related to the physical perception of each sense modality (vision, hearing, touch, smell and taste), but they are used to express other meanings as well ('to meet' as in *I'll see you at seven*, 'suspicion' as in *to smell fishy*, 'to experience' as in *to taste success*). The aim is, therefore, to find out which semantic extensions are found in this semantic field, but also to put forward hypotheses as to **why** and **how** these polysemous senses happen.

Why it is possible that, for instance, the verb *to see* can mean both 'to perceive with one's eyes', but also 'to understand' as in *I see what you mean*. Why whenever we want to express that we are emotionally moved we use the verb *to touch* (as in *deeply touched*), but we cannot use any other perception verb such as *to smell*, *to hear* to convey the same meaning. In other words, the question is why these semantic extensions seem to occur between very specific conceptual domains and not others.

The reasons *why* these semantic extensions take place are important, but the question of *how* these meanings are obtained is equally crucial. How these semantic extensions are carried out, that is how two different conceptual domains, such as physical visual perception and intellection are connected, and brought together. How is it possible to shift from a physical domain to a more abstract domain? How many elements take part in the creation of the polysemy found in these verbs?

And finally, this study will address the issue of how universal these polysemous senses are to be considered; that is to say, whether these semantic extensions are particular to one language or shared by different unrelated languages. For this purpose, three languages from different families have been chosen: two Indo-European languages, English (Germanic) and Spanish (Romance), and Basque, a non-Indo-European language, apparently related to nothing else at all¹.

In this thesis, I will tackle these questions and provide a framework which will shed some light on the study and understanding of polysemy.

The basic theoretical assumptions in this thesis belong to the framework of Cognitive Linguistics. The main theoretical and methodological principles of this model are presented in Section 1.1. In Section 1.2, I offer an overview of the state of the art in polysemy. Three main trends in polysemy are analysed: Traditional Semantics (Section 1.2.1), Cognitive Semantics (Section 1.2.2), and Lexical Semantics (Section 1.2.3). This chapter finishes with an outline of the organisation of this thesis in Section 1.3.

1.1. THEORETICAL FRAMEWORK: COGNITIVE LINGUISTICS

Cognitive Linguistics is a new approach to the study of language that emerged in the 1970's as a reaction against the dominant generative paradigm which pursues an autonomous² view of language (see Ruiz de Mendoza 1997). Some of the main assumptions underlying the generative approaches to syntax and semantics are not in accordance with the experimental data in linguistics, psychology and other fields; the 'generative commitment' to notational formalism, that is to say the use of

¹ There have been many speculations about possible origins and connections (or lack of them) of Basque since the sixteenth century. The search for relatives has been extraordinarily varied: from almost every single language or language family in the Old World to even some New World languages. Trask (1997: ch. 6) gives a very detailed account of such attempts.

² The view of the language as an autonomous entity goes back to Structuralism (De Saussure 1916; Bloomfield 1914): in this model, the meaning of a word is determined by the language system itself, whereas people's perception, interaction and conceptualisation are extra-linguistic factors. In the Generative approach (Chomsky 1986), language is also viewed as autonomous but in a rather different way. The language faculty (computational device which generates the sentences of a language through the recursive rules on structured strings of symbols, assigning syntax and semantics) is itself an autonomous component of mind, independent of other mental faculties.

'formal grammars' that views languages as systems of arbitrary symbols manipulated by mathematical rules of the sort first characterised by Emil Post, is used at the expense of descriptive adequacy and psychological realism (see Lakoff 1987). What Lakoff refers to as 'nonfinitary phenomena' (Lakoff 1990: 43), i.e. mental images, general cognitive processes, basic-level categories, prototype phenomena, the use of neural foundations for linguistic theory and so on, are not considered part of these grammars because they are not characterisable in this notation. It is from this dissatisfaction with the dominant model that Cognitive Linguistics is created. Cognitive Linguistics is not a totally homogeneous framework. Ungerer and Schmid (1997) distinguish three main approaches: the Experiential view, the Prominence view and the Attentional view of language.

The 'Experiential view' follows a practical and empirical description of meaning. In this approach it is the user of the language who tells us what is going on in their minds when they produce and understand words and sentences. Eleanor Rosch *et al.* (1977, 1978) carried out the first research within this approach, mainly in the study of cognitive categories, which led to the prototype model of categorisation.

Within this framework, the knowledge and experience human beings have of the things and events that they know well is transferred to those other objects and events, which they are not so familiar with, and even to abstract concepts. Lakoff and Johnson (1980) were among the first ones to pinpoint this conceptual potential, especially in the case of metaphors. However, this does not only apply to the field of metaphor but to other figurative resources which are not considered part of the language in more traditional linguistics, such as metonymy (Panther and Radden 1999; Radden and Kövecses 1996 and Kövecses and Radden 1998).

The 'Prominence view' is based on concepts of profiling and figure/ground segregation, a phenomenon first introduced by the Danish gestalt psychologist Rubin. The prominence principle explains why, when we look at an object in our environment, we single it out as a perceptually prominent figure standing out from the ground. This principle can also be applied to the study of language; especially, to the study of local relations (cf. Brugman 1981, 1988; Casad 1982, 1993; Lindner 1982; Herskovits 1986; Vandeloise 1991; among others). It is also used in

Langacker's (1987, 1991a) grammar, where profiling is used to explain grammatical constructs and, figure and ground for the explanation of grammatical relations.

Finally, the 'Attentional view' assumes that what we actually express reflects which parts of an event attract our attention. A main concept of this approach is Fillmore's (1975) notion of 'frame', i.e. an assemblage of the knowledge we have about a certain situation. Depending on our cognitive ability to direct our attention, different aspects of this frame are highlighted, resulting in different linguistic expressions (see Talmy 1988, 1991, and 1996).

Despite these three different viewpoints in Cognitive Linguistics (see also Wierzbicka 1986, 1990), the majority of cognitive linguists agree on the tenets described in the following section. In both sections 1.1.1 and 1.1.2 I follow Barcelona's (1997) framework for describing the methodological and theoretical principles in this approach.

1.1.1. MAIN TENETS IN COGNITIVE LINGUISTICS

As human beings the way in which we interact with our world through our spatial and temporal orientation, our manipulation of objects, our perception of the things that surround us and our bodily movements influences how we construct and understand meaning. Based on empirical research in different areas such as Cognitive Psychology (Rosch 1973, 1977, 1978, 1983; Rosch and Mervis 1975), and Anthropological Linguistics (Berlin and Kay 1969; Kay 1975) Cognitive Linguistics argues that both the design features of languages, and our ability to learn and use them are accounted for by general cognitive abilities, kinaesthetic abilities, our visual and sensimotor skills and our human categorisation strategies, together with our cultural, contextual and functional parameters (Barcelona 1997: 8).

Other approaches such as the Modularity Hypothesis (cf. Chomsky 1986; Fodor 1983) view the ability to learn one's mother language as a unique faculty, as a special innate mental module; here, language is understood as a product of general cognitive abilities. It is the result of what Lakoff calls 'the cognitive commitment'; the fact that linguistic theory and methodology must be consistent with what is empirically known about cognition, the brain and language (Lakoff 1990: 40).

Therefore, the most fundamental tenet in this model is **embodiment** (Johnson 1987; Lakoff 1987; Lakoff and Johnson 1980, 1999). Mental and linguistic categories are not abstract, disembodied and human independent categories. They are created by our experience of the world around us and constrained by our body. Human conceptual categories, the meaning of words and sentences and the meaning of linguistic structures at any level, are not a set of universal abstract features or uninterpreted symbols (Barcelona 1997: 9). They are **motivated** and grounded more or less directly in experience, in our bodily, physical, social and cultural experiences, because after all, “we are beings of the flesh” (Johnson 1992: 347).

The second main idea is related to the theory of linguistic meaning. Most cognitive linguists reject ‘objectivist’ theories of meaning. The term ‘objectivism’ is used by Lakoff (1987, 1988) and Johnson (1987) to refer to those theories of linguistic meaning that understand objective reality as independent from human cognition, such as Frege (Geach and Black 1952), Montague’s Model-theoretical Semantics (Dowty *et al.* 1981; Cann 1993) and Barwise and Perry’s (1983) Situation Semantics. For Cognitive Linguistics, meanings do not exist independently from the people that create and use them (Reddy 1993). Linguistic forms do not have inherent meanings in themselves, they act as clues activating the meanings that reside in our minds and brains. This activation of meaning is not necessarily entirely the same in every person, because meaning is based on individual experience as well as collective experience (Barcelona 1997: 9).

Therefore, for Cognitive Linguistics, we have no access to a reality independent of human categorisation, and that is why the structure of reality as reflected in language is a product of the human mind. Semantic structure reflects the mental categories which people have formed from their experience and understanding of the world. This understanding of our linguistic skills as the result of our cognitive abilities leads to deep methodological differences in respect to more traditional approaches to meaning, as we shall see in the following section.

1.1.2. METHODOLOGICAL PRINCIPLES

Human categorisation is one of the major issues in Linguistics. The ability to categorise, i.e., to judge that a particular thing is or is not an instance of a particular

category, is an essential part of cognition. Categorisation is often automatic and unconscious, except in problematic cases. This can cause us to make mistakes and make us think that our categories are categories of things, when in fact they are categories of abstract entities. When experience is used to guide the interpretation of a new experience, the ability to categorise becomes indispensable. How human beings establish different categories of elements has been discussed ever since Aristotle.

The classical view on categorisation, that of Aristotle³, claims that categories are defined in terms of a conjunction of necessary and sufficient binary features, that is to say that linguistic analytical categories impose a set of necessary and sufficient conditions for the membership in the category. This requirement not only implies that categories have clear boundaries and that all members of a category have equal status (Taylor 1995: 25) but also that there is an abstract, general definition with which all the members of that category must comply. For instance, the different senses of the word *hand* in *John's hands are very big* and in *The hour hand of the clock* would be considered as related to one general, core abstract sense of *hand*.

However, this abstract definition of 'core meaning' is problematic; as Sweetser (1986) points out, in cases when the extension of meaning has been carried out by means of metaphor or metonymy, it is very difficult to identify this abstract meaning. In the examples above, it could be argued that this core sense is a 'pointing function', but this core meaning cannot account for other instances of *hand* as in *My life is in your hands*, *They are taking new hands* or *This matter is out of my hands*. These other examples lead us to another problem: no matter how complex this core abstract meaning could be, it will leave some likely candidates outside.

These above examples would be analysed quite differently under the Cognitive Linguistics methodology. Instead of relating these different senses to an abstract default sense that includes all of them, the cognitive approach adopts a prototype categorisation model (cf. Rosch 1973, 1977, 1978, 1983; Rosch and Mervis 1975; Mervis and Rosch 1981). In this model human categories have two

³ Aristotle distinguished between the essence of a thing (what makes a thing be what it is, indicates its individuality, its destruction is the destruction of all) and the accidents of a thing (incidental properties, not determining part).

types of members: the ‘prototype’ and several less-central members related to the former in a motivated way. The prototype is the best, the most prominent and the most typical member of a category. It is the example that first comes to mind when one thinks of that category.

Prototype categorisation⁴ stems from Ludwig Wittgenstein’s (1953) thesis that necessary and sufficient conditions are not appropriate for defining the meanings of many words. His example of the concept of *game* showed how there are very few properties, if any, that are shared by all games; instead, one game shares some properties with another game, and this other game may share some properties with a third and so on. This concept of *game* is based on what he called ‘family resemblance’: members of a family resemble one another in various ways. But, everyone in the family does not need to share the collection of properties that define that family, gradience (how much a member belongs to the family) and centrality (central/good and non-central/bad members). In this same line of research, we find other linguists and philosophers such as Austin (1961) (relationships among meanings of words; analogy; primary nuclear sense⁵); Zadeh (1965) (study of categories with fuzzy boundaries); Lounsbury (1964) (kinship categories); Berlin and Kay (1969) (colour categories as an empirical establishment of Wittgenstein’s ideas of gradience and centrality), and the primary study of basic-categories of Brown (1958, 1965). However Eleanor Rosch (see references above) was the first to provide a general perspective on these problems.

Following Rosch’s approach to categorisation, a cognitive methodology identifies the prototypical use of *hand* as that referring to a part of the body, and would treat the other uses of this lexical item as motivated, non-prototypical senses, related to the prototypical sense in a systematic way. In *The hour hand of the clock*, *My life is in your hands* and *This matter is in your hands*, the link is carried out by means of metaphor; whereas in *They are taking new hands*, the link is metonymical (part for whole).

⁴ See Lakoff (1987: Ch.2) and Taylor (1995: Ch.3.2.) for discussion on early development research into categorisation. See Ungerer and Schmid (1996) for an overview on ‘Prototypes and Categories’ (Ch.1) and ‘Levels of Categorisation’ (Ch.2).

⁵ i.e. the central-prototypical sense.

Another consequence of the primacy of cognitive abilities is that there is no strict distinction between encyclopaedic and linguistic knowledge. Objectivists differentiate between these two different epistemological types of knowledge. On the one hand, ‘linguistic’ or ‘definitional’ knowledge that “corresponds to the essential properties of the entities and categories that the words designate”; and on the other, ‘encyclopaedic’ knowledge “corresponds to the contingent properties of the entities and properties that the words designate” (Lakoff 1987: 172). This dictionary-encyclopaedia distinction leads objectivists to postulate a ‘meaning *per se*’ (Leech 1981: 70), independent of whatever the speaker may know about the states of affairs that he is referring to. This paradigm also induces the distinction between literal (objectively true or false) and figurative meaning (no direct correspondence to entities and categories in the real world).

For Cognitive Linguistics, however, this distinction is not strict. Meanings are cognitive structures embedded in our patterns of knowledge and belief; conventional meanings arise from experience and knowledge and our complex conceptual structures are invoked in language use and comprehension⁶. The fact that our experience-based knowledge is present in linguistic meaning at every level implies that there is not a strict distinction between lexicon and grammar⁷, between semantics and pragmatics, between synchrony and diachrony. This is possible because the same social, functional and cognitive motivation present in historical changes is also observable in ongoing changes (Barcelona 1997: 11).

This continuum between language and experience has led cognitive linguists to study how conceptual structures or cognitive models are reflected in language. According to Langacker (1987: 147ff.), most concepts invoke other concepts and without making an explicit reference to them, they cannot be adequately defined. Consider for instance the concept of [MONDAY]. If we ask ourselves about the meaning of the word *Monday*, we will probably say that it is a day of the week; but again what is the meaning of [WEEK]? *Weeks* are imaginative creations of the human

⁶ That is why meaning is claimed to be ultimately pragmatic.

⁷ As Langacker (1987: 3) states “Lexicon, morphology, and syntax form a continuum of symbolic structures, which differ along various parameters but can be divided into separate components only arbitrarily”.

mind. The kind of imaginative structure required for the description of concepts such as [MONDAY] are what Langacker (1987: 150) calls ‘abstract domains’: “any concept or conceptual complex that functions as a domain for the definition of a higher-order concept”. These abstract domains are equivalent to Lakoff’s (1987) ‘Idealised Cognitive Models’ (ICMs) and Fillmore’s (1982, 1985) ‘frames’. These abstract domains give structure to what Langacker (1987: 148) refers to as ‘basic domains’, i.e. primitive representational fields, not reducible to another; they occupy the lowest level of conceptual complexity. These basic domains are what Lakoff (1987: 281), following Fauconnier’s (1985) terminology, calls ‘mental spaces’⁸, mediums for conceptualisation and thought. In this case, the basic domain of the concept of [WEEK] would be [TIME].

In some cases, one abstract domain or ICM on its own cannot define the meaning of words. The latter may need the characterisation of several ICMs simultaneously; this is what Lakoff (1987:74) calls ‘cluster models’ (or domains).

Another consequence of this primacy of general cognitive abilities is the essential role of **imagination**. For many people, the word imagination is related to subjectivism, idealism, and relativism. Since the Enlightenment⁹, imagination has been despised in many theories of language, because it is regarded as a non-rational, unruly, and idiosyncratic play of ideas, and therefore, unsuitable for scientific research. In Cognitive Linguistics, imagination is considered a basic human cognitive ability, central to human meaning and rationality. As Johnson (1987: 172) explains, the way we reason and what we can experience as meaningful are both based on structures of imagination that make our experience what it is. We make sense of our less directly apprehensible experiences on the basis of more directly apprehensible experiences. For instance, Lakoff and Johnson (1980: 14ff.) have shown how we project part of our bodily experience of three-dimensional space onto our experience of happiness, when we say *My spirits rose*; or onto our experience of sickness and death, as in *He came down with flu*.

⁸ ‘Mental spaces’ are “constructs distinct from linguistic structures but built up in any discourse according to guidelines provided by the linguistic expressions” (Fauconnier 1985: 16).

⁹ See Johnson (1987: Ch. 6) for an account on the history of Imagination.

Metaphor and **metonymy** are two basic imaginative cognitive mechanisms. They are not figures of speech, as they are considered by many traditional objectivist approaches (see, for example, Halliday 1985: 319-20); not even the result of a wide array of contextual implications, as proposed by Relevance theory (Sperber and Wilson 1995: 231-37; Papafragou 1996; Goatly 1997)¹⁰. They are the means by which it is possible “to ground our conceptual systems experientially and to reason in a constrained but creative fashion” (Johnson 1992: 351). As Barcelona (1997: 12) puts it both mechanisms are “complex mental projections or mappings of our knowledge of one domain of experience [the source domain] to structure our knowledge of a different domain of experience [the target domain]” (Barcelona 1997: 12). But, whereas in metaphor, we map part of one conceptual domain onto another separate domain, in metonymy, the mapping takes place within the same domain.

For instance, in the sentence *I see what you mean*, we have two different experiential domains: the source domain of the bodily act of visual perception and the target domain of intellection. The mapping between these two different conceptual domains is carried out by means of metaphor. However, in *Mary tasted the camembert*, the mapping does not take place between different conceptual domains, but within the same domain through metonymy; instead of the word *cheese*, we have the name of the place where it is produced¹¹.

In cases when the experiences mapped are more direct these can be understood metaphorically or metonymically on the basis of ‘**image schemas**’. These are “preconceptual structures that we acquire as a result of our earliest bodily experiences” (Barcelona 1997: 12). Sentences such as *Prices are going down* or *Turn up the radio* are based on the metaphor MORE IS UP / LESS IS DOWN. This metaphorical projection from MORE to UP is in turn based on our understanding of quantity in terms of the VERTICALITY schema. This schema is based on our everyday bodily experience: whenever we put more liquid in a container, the level goes up. Other

¹⁰ Johnson (1992), Dirven (1993), Gibbs (1994), Cameron and Low (1999) are good reviews of different approaches to these two tropes (mainly metaphor).

¹¹ Radden and Kövecses (1996: 15) call this metonymy PLACE FOR THE PRODUCT MADE THERE, and include it in the *Production ICM*.

basic conceptual schemas are: the 'CONTAINER schema', the 'SOURCE-PATH-GOAL schema', the 'FIGURE/GROUND schema', the 'BALANCE schema' and so on (see Johnson 1987).

Most of these image schemas, metaphors and metonymies operate on the basis of a conventional 'frame' or ICM. For instance, the metonymic mapping between the food eaten and the customer in Lakoff and Johnson's (1980: 35) example *The ham sandwich is waiting for his check* works against the background of the conventional restaurant frame or ICM.

Research on metaphor occupies a central position in Cognitive Linguistics. One of the major problems that cognitive linguists still face is the question of how to constrain metaphorical mappings. As we shall see in Chapter 6, attempts to constrain the mapping process in metaphorical production and comprehension can be found in Lakoff's (1990, 1993) 'Invariance Principle'¹², i.e. "metaphorical mappings preserve the cognitive topology of the source domain in a way consistent with the inherent structure of the target domain" (Lakoff 1993: 215). The Invariance Principle is useful in order to constrain the nature of those mappings: that is to say, it is not possible to map from the source domain structure that does not preserve the inherent structure of the target domain. The only problem with this principle is that it does not show exactly what part of the source domain is the one that must be consistent with the structure of the target domain.

Metonymy has received less attention than metaphor in Cognitive Linguistics¹³. Although early studies, such as Lakoff and Johnson (1980: Ch. 8) and Lakoff (1987: Ch. 5-8 and case study 2), have stressed its importance for categorisation, it was not until recently that metonymy came to be at the core of current investigation. Radden and Kövecses (1996) and Kövecses and Radden (1998) propose a working definition for metonymy based on Langacker's (1993)

¹² See also Lakoff and Turner (1989: 82), Brugman (1990), Turner (1987: 143-148, 1990a, 1991: 172-182, 1996), Jakel (1997).

¹³ For a review of the research on metonymy in Cognitive Linguistics, see Gibbs (1994: Ch.7).

formulation¹⁴ that metonymy is a cognitive process through which we acquire access to a mental entity via another mental entity and Lakoff's theory of ICMs. Kövecses and Radden define metonymy as "a cognitive process in which one conceptual entity, the vehicle, provides mental access to another conceptual entity, the target, within the same domain, or ICM" (1998: 39). This view on metonymy involves four questions that need to be addressed in the framework of metonymy: (i) identification of the ontological realms where metonymy can occur; (ii) specification of the types of conceptual relationships between the metonymic elements; (iii) definition of the cognitive and communicative principles that select the most 'natural' vehicle-to-target routes; and (iv) definition of the conditions for the selection of 'non-default routes'.

Another important and interesting area of research is the interaction between metaphor and metonymy. Goossens (1990) proposes the term 'metaphonymy' to cover the possible interrelations between metaphor and metonymy. Among these interrelations, he distinguishes two as the dominant patterns: one where the experiential basis for metaphor is a metonymy ('metaphor from metonymy') and another where a metonymy functioning in the target domain is embedded within a metaphor ('metonymy within metaphor'). Along similar lines, Barcelona (1997, 1998, in press b) proposes the conceptual dependency of metaphor on metonymy. Another tendency is the theory of 'blending' or 'conceptual integration'. This theory, developed from Fauconnier's early work on 'mental spaces' (1985, 1994) and then by him and Turner (Fauconnier 1997; Fauconnier and Turner 1994, 1996, 1998; Turner and Fauconnier 1995), takes metaphor and metonymy under a more general mental mapping mechanism called 'blend'. As Barcelona (1997: 12) summarises "this theory seems to explain how speakers and hearers keep track of referential values and other factors in the conceptual mappings occurring throughout a discourse, by constructing provisional conceptual domains or 'blends'".

As we shall see later in the analysis, this view of metaphor and metonymy as largely automatic correspondences between experiential domains can be applied to

¹⁴ "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)" (Langacker 1993: 30).

the study of polysemy. In Cognitive Linguistics, the central approach to polysemy is not that a word is associated with different senses but that these meanings are related in a motivated systematic way by means of metaphorical and metonymical mappings.

1.1.3. SUMMARY

In this section, I have summarised the main theoretical and methodological tenets in the framework of Cognitive Linguistics. This thesis is built on these assumptions. It has been shown how this model takes human experience as the motivation for what is meaningful in the human mind; thought is not a manipulation of symbols but the application of cognitive processes to conceptual structures. Meaning structures come not only from the direct relationship with the external world but also from the nature of bodily and social experience (how humans experience with the world) and from human capacity to project from some aspects based on this experience to some abstract conceptual structures. This is perhaps one of the achievements of this approach: the fact that imaginative aspects of reason, such as metaphor, metonymy and mental imagery are seen as central to reason, not as extra-linguistic aspects. This allows for the existence of those meanings that do not have real-world reference. As we shall see in Chapter 4, within the Cognitive Linguistics framework, Eve Sweetser (1990) demonstrates that some polysemous structures in Indo-European can be explained only by metaphorical projections, motivated by common human experiences, within the human conceptual system.

In the following section, I review the state of the art in polysemy. Three main trends in polysemy are analysed in this section: Traditional Semantics (Section 1.2.1), Cognitive Semantics (section 1.2.2), and Lexical Semantics (Section 1.2.3).

1.2. THE STATE OF THE ART IN POLYSEMY

Polysemy has been traditionally defined as the case when “a lexical item¹⁵ ... has a range of different meanings” (Crystal 1991: 267). This definition could seem to

¹⁵ There has been some discussion on the terminology used for the definition of what a word is in dictionaries. Leech (1981: 229) proposes two definitions for ‘lexical item’:

(i) a bundle of lexical entries sharing the same morphological specification *p*:

be very simple and straightforward at first, but since Bréal (1900) addressed the problem that this term may involve, many linguists have tried to find a solution for it, without giving a definitive answer for it¹⁶. Polysemy is always presented in opposition to homonymy. The basic criteria for differentiating the two cases is to say that polysemy happens when one form has several meanings and homonymy, when two lexical items happen to have the same phonological form¹⁷.

These definitions could make the problem look simple and place both cases at opposite ends; especially if we look at typical examples of polysemy, like the verb *run*, or at examples of homonymy such as *bank* ('river bank', 'money bank'). However, these definitions do not work for most of the cases where there is an ambiguity in meaning, mainly because of the great number of borderline cases in which the differences between one term and another are not so clear-cut (Lehrer 1974).

In this Section, some of the main approaches dealing with these phenomena are reviewed. These approaches are Traditional Linguistics (Lyons 1977; Palmer 1981; Cruse 1986), Cognitive Linguistics (Johnson 1987; Lakoff 1987; Taylor 1995), and Lexical Semantics and the Generative Lexicon (Pustejovsky 1995).

1.2.1. TRADITIONAL APPROACHES TO POLYSEMY: WHAT IS POLYSEMY? WHAT IS HOMONYMY?

The traditional distinction between polysemy and homonymy is based on whether there is one or two lexical items involved. Lyons (1977: 550) considers them

(ii) a bundle of lexical entries sharing the same morphological specification p_i and the same syntactic specification q_i

Leech argues that it would be better to name each definition with a different term, namely 'lexical item' and 'lexeme' respectively. In this thesis, no distinctions are made between these two terms, although the words dealt with in the analysis fall within the scope of definition (ii).

¹⁶ For an account of the changing patterns in the study of polysemy from antiquity to the 20th century, see Nerlich and Clarke (1997).

¹⁷ Authors such as Taylor (1995), differentiate between homonymy and monosemy, where the former is only restricted to those cases when unrelated meanings are attached to the same phonological form and the latter when the lexical item has a single sense. As will be seen later, Lyons (1977) includes under homonymy both cases, although he does differentiate between partial homonymy, i.e. homography and homophony, and absolute homonymy.

as two types of lexical ambiguity¹⁸ and introduces some criteria for deciding when it is polysemy and when it is homonymy.

One criterion is etymological information about the lexical item in question. Lexical items with the same origin are considered as polysemic, whereas if they have evolved from distinct lexemes in some earlier stage of the language then they are regarded as homonymous. This condition is neither satisfactory nor decisive because the history of the language does not always reflect its present state. For instance, in present-day English, the lexemes *pupil*₁ ‘student’ and *pupil*₂ ‘iris of the eye’ are not usually related by native speakers, but they are both derived from Latin *pupillus pupilla* ‘ward, orphan-boy’ which is itself a diminutive of *pupus* ‘child’¹⁹. The opposite case is also fairly common, namely when native speakers consider two lexemes derived from different roots in an earlier stage of the language as related. For example, the lexemes *ear*₁ ‘organ of hearing’ and *ear*₂ ‘spike of corn’ come from two different origins: *ear*₁ evolves from OE *êare* from IE **aus-* (cf. Latin *auris* ‘ear’) and *ear*₂ from OE *êar* (cf. Latin *acus, aceris* ‘husk’) and they merged into *er(e)* in ME. However, most people nowadays treat these two lexemes as one polysemous word and explain their relation by means of metaphor. Therefore, the etymological criterion can be very misleading²⁰ when deciding between homonymy and polysemy.

Another criterion is the unrelatedness vs. relatedness of meaning; i.e. the native speaker’s feeling that certain meanings are connected and that others are not. One of the major drawbacks that Lyons states for this criterion is that relatedness of meaning appears to be a matter of degree, together with the fact that sometimes native speaker’s intuitions²¹ are far from being the true interpretation, as has been seen with the *ear* example above. Attempts to formalise this relatedness of meaning have also been made. Katz (1972), Katz and Fodor’s (1963) Componential Analysis

¹⁸ Ambiguity itself is a complicated term as well. Tuggy (1993) sees ambiguity as related to homonymy and polysemy more related to vagueness.

¹⁹ This example is very interesting because in Spanish the word *niña* also covers both meanings ‘young girl’ and ‘eye’s pupil’.

²⁰ Lyons (1977: 551) further states that the etymological criterion should not take part in the definition of homonymy. First, speakers are not aware of such historical developments. Second, this information is irrelevant for synchronic analysis of languages.

²¹ In Leech’s (1981: 229) view, the native speaker’s intuitions are valid as long as the speaker expresses the relation between meanings in terms of lexical rules. These lexical rules have psychological reality to the extent that they are part of the native speaker’s linguistic competence.

proposes the decomposition or breakdown of the sense of a word into its minimal distinctive features, i.e. into semantic components which contrast with other components. These minimal distinctive features produce formulae called componential definitions of the type [\pm human], [\pm adult], [\pm male] for the description of lexemes such as *man*, *woman*, *girl*, *boy* in the semantic field of ‘human race’ (see Leech 1981: 96ff.).

Unfortunately, this type of approach is not sufficient for the polysemy-homonymy problem. First, the relatedness in the different sense of a word might not be expressible in terms of \pm features and also because in some cases, these features are present in different degrees, not in absolute terms. A classical example of this problem is the word *bachelor* (Fillmore 1977, 1982). In a simplified world, where people are marriageable at a certain age, mostly marry at that age and stay married to the same person, *bachelor* is just any unmarried male past marriageable age. However, outside this simplified world, the word *bachelor* does not apply. That is why we find it so odd to call the Pope or a twice-married divorcé *bachelor*, even though they both meet the criteria of the definition given above²². Secondly, as Lyons (1977: 553) points out, “the possibility or impossibility of decomposing the senses of lexemes into a (structured or unstructured) set of semantic components is irrelevant, unless we can specify just how many components, or alternatively what kind of components, two senses must share in order for them to meet the criterion of relatedness of meaning”.

An alternative solution for both problems is presented in my Property Selection Processes in Chapter 6. I propose that, by means of different properties present in the prototypical meaning of the lexeme, it is possible to describe such lexemes and then see how only some of those prototypical properties are present in the potential polysemous senses that may belong to such a lexeme. This would be a possible formal explanation for such relatedness of meaning among possible polysemous words.

²² Similar examples are discussed in Lakoff (1987) (*mother*), Coleman and Kay (1981) and Sweetser (1987) (*lie*).

A third way of attempting to establish polysemy is to search for a central or core meaning. Based on the classical definition of a category as a set of necessary and sufficient conditions for membership, Allerton (1979) proposes that when different senses of a lexeme share a core meaning, they are polysemous. On the other hand, cases when the core meaning cannot be extracted are to be considered as homonymous. For instance, the word *paper* can mean ‘newspaper’, ‘document’ and ‘academic lecture’; all these senses share the core meaning of ‘important written or printed material’. According to Palmer (1981: 105), this is possible when we have cases of metaphors and the other senses have been transferred from that core meaning. The disadvantage of this criterion is again to decide what the core meaning is. As will be seen later in the discussion, under the Cognitive Linguistics approach, neither the core meaning approach nor Palmer’s acceptance of it in metaphorical cases is admitted. The reason is the fact that metaphor is understood as a motivated transfer between two different domains and this core meaning approach totally defeats any attempt to show a motivated account of semantic extension. The alternative to this approach within Cognitive Linguistics is the ‘family resemblance model’ (Taylor 1995: 106) or what Lakoff (1987: Ch. 6, 1996: Ch. 1) calls ‘radial categories’.

Finally, there have been attempts to test the ambiguity²³ of lexical items. Cruse (1986: 54ff.) makes a distinction between ‘indirect’ and ‘direct’ ambiguity tests. ‘Indirect’ tests are designed to find two occurrences of a word form with different relations of meaning; these relations can be paradigmatic (e.g. synonymy) or paronymic (i.e. identity of root but different syntactic category). According to Cruse (1986), these tests are invalid since nothing can be reliably inferred from the fact that a word form has different meaning relations in different contexts.

For the ‘direct’ ambiguity tests Cruse (1986) offers three criteria:

- (i) Contextual modulation: an ambiguous form should not in every case be totally conditioned by its contexts. In a disambiguating context, the word may carry more information that can be accounted for in terms of interaction between the context-independent meaning of the word and the semantic information of the

context itself, whereas in cases of contextual modulation all information is derived from the context.

(ii) Independently maximisable separate senses: under certain conditions, the application of certain terms must be maximised within the current universe of discourse, even if it creates some oddness²⁴.

(iii) Antagonism of independent senses: cases where senses cannot arise simultaneously without causing oddity²⁵. This antagonism of senses can be tested by the ‘co-ordination test’; it is argued that sentences with an ambiguous lexeme cannot have both meanings at the same time. For instance, in a sentence like (1), the word *light* cannot mean both that the room is bright and that the furniture is not heavy (Palmer 1981: 106).

(1) The room and the furniture were *light*.

Another test is that proposed by Kempson²⁶ (1977: 129). She argues that to distinguish ambiguous sentences, it is necessary to turn to anaphoric processes such as the insertion of an expression like *to do so too*, where the anaphoric expression demands identity of meaning of the two verb phrases in question.

(2) John went to the bank and Will *did so too*.

In this case, *bank* has to refer to the same entity, either the financial institution or the side of the river in both VPs, but not to a different entity in each one.

²³ For an extended discussion of ambiguity, see Kempson (1977), Zwicky and Sadock (1975) and Cruse (1986).

²⁴ The two contrastive examples Cruse (1986: 60) gives are:

(1) ? Mary likes mares better than horses

(2) John prefers bitches to dogs

The oddity of (1) and the acceptance of (2) can be explained in terms of prototype theory. *Mare* and *horse* do not correspond to the same level of categorisation: *mare* is subordinate level category, whereas *horse* is a basic level category. If instead of *horse*, it had been *stallion*, the respective subordinate level word, the sentence would have been correct. What happens in (2) is that *dog* represents both the subordinate and the basic level categories, and therefore, the suitable category for this particular case, i.e. subordinate level one, has been chosen.

²⁵ The variety of anomaly brought by this simultaneous link of independent senses is allowed in some contexts and is traditionally labelled as ‘zeugma’.

²⁶ A first version of the *do so* test was first discussed by Lakoff (1970).

A third test is the so-called ‘identity test’. In a sentence like (3), the adjective *light* refers directly to Mary’s coat and anaphorically to Sue’s.

- (3) Mary is wearing a *light* coat; so is Sue. (Cruse 1986: 62)

The adjective *light* can have two interpretations ‘not heavy’ or ‘not dark’; in (3) it must have just one of them, in both of the instances where it is implied, directly or anaphorically.

These tests seem to work well in some ambiguous cases, but unfortunately, there are too many counterexamples for us to be able to take these tests as a definitive way of resolving ambiguity (Zwicky and Sadock 1975).

Another important distinction between polysemy and homonymy is the syntactic behaviour of the linguistic form in question. Traditionally, homonymous words are thought to be represented by two different syntactic categories.

As a way around these insufficient criteria, Lyons proposes the possibility of circumventing the problem: the maximisation of either homonymy or polysemy; that is to say, either to associate a separate lexeme with every distinct meaning or group every distinct meaning under the same lexeme. The maximisation of homonymy is the alternative chosen by Kempson (1977), who proposes a ‘constant semantic value’ (1977: 82) for each lexical item in a language. If a lexical item has more than one sense, it is characterised separately without taking into account the relation of this sense with the other meanings conveyed by that lexeme. The other possibility, the maximisation of polysemy, is taken by Cognitive Linguistics, although it is restricted as they only consider the senses associated with a polysemous word with the same syntactic category. Neither of these possibilities offers a complete solution, although for methodological reasons the latter is preferred to avoid an infinite number of dictionary entries.

One of the reasons that Lyons suggests for rejecting the maximised homonymy alternative is precisely the fact that distinctions of sense can be multiplied indefinitely as in examples such as *mouth of the river*, *mouth of the tunnel*, *mouth of*, etc. Taylor (1995: 105) also rejects this possibility on the basis of a prototype categorisation theory. I argue in Chapter 7 that it is very important to bear in mind what it is that really causes the multiplicity of meaning: is it the possible

ambiguous lexeme (*mouth*) or the lexeme in conjunction with other arguments or modifiers (*of the river, of the tunnel*)?

In view of these unsuccessful possibilities, Lyons attempts to make the distinction between polysemy and homonymy more precise by proposing three necessary conditions for absolute homonymy (L_i and L_j are two lexical items):

(i) $L_i \neq L_j$ (Lexemic distinctness: the fact that there are two different senses involved).

(ii) $L_i^* = L_j^*$ (Formal identity, which subdivides homonymy into partial homonymy cases: homophony (two word-tokens are formally identical in the phonic medium if they have the same phonological representation) and homography (two word-tokens are formally identical in the graphic medium if they have the same orthographic representation)).

(iii) $(x \in L_i^* \ \& \ y \in L_j^* \ \& \ x = y \ \& \ R(x, w_i) \ \& \ R(y, w_j) \ \rightarrow \ (w_i \equiv w_j))$.

Where R symbolises the relationship of realisation that holds between a form and a morphosyntactic word. (Grammatical equivalence: the fact that both senses belong to the same morphosyntactic category).

Lyons' main aim in trying to define absolute homonymy is to show that polysemy²⁷ and absolute homonymy tend to produce purely lexical ambiguities, whereas partial homonymy tends to produce ambiguity only in certain contexts.

These traditional approaches to polysemy provide a more or less successful descriptive analysis of what polysemy and homonymy are; what lexical items are homonymous or polysemous. Their major problem, however, is that they fail to address several fundamental issues: the reasons why these lexical items have several senses attached to them in the first place; how these meanings are structured: are these senses grouped under the same lexical item by chance or is there any motivation for the lexical item to convey specific meanings? Is the semantic content of a single lexical item enough to create polysemy or, on the contrary, is the

²⁷ Lyons defines polysemy as "the product of metaphorical creativity" (1977: 567). It will be argued later in the analysis in Chapter 7 that polysemy is not only produced by means of metaphor, but also by virtue of combinations between the different elements in the sentence in question.

interaction with the semantic content of the other lexical items that co-occur in the same sentence necessary?

These issues, neglected by traditional approaches, are at the core of investigation in Cognitive Semantics. In the following section, I present the explanations that this model provides for these questions.

1.2.2. COGNITIVE SEMANTICS

Within this framework, the main distinction between polysemy and homonymy is the systematic relation of meanings that takes place in polysemy (Lakoff 1987: 316; Johnson 1987: 193). When speaking about polysemy, the fact that we are dealing with multiple meanings is not the main point but the fact that those multiple meanings are related in a systematic and natural way.

According to Lakoff (1987), polysemy has to be understood as categorisation, that is to say the idea that related meanings of words form categories and that these meanings bear family resemblance, an idea introduced by Austin (1961). Taylor (1995: 108) explains this family resemblance category in terms of ‘meaning chains’. A lexeme can convey different meanings, *A, B, C, D, ...*. *A* is related to *B* in virtue of some shared attribute(s) or other kind of similarity. Meaning *B* in turn becomes the source of a further extension to meaning *C* and so on. This ‘meaning chain’ can be represented in (4), where any node in a meaning chain can be the source of any number of meaning expressions:

$$(4) \quad A \rightarrow B \rightarrow C \rightarrow D \dots$$

Taylor compares these ‘meaning chains’ to Lakoff’s ‘radial categories’. A category is structured radially with respect to a number of subcategories: there is a central subcategory, defined by a cluster of covering cognitive models and in addition, there are noncentral extensions which are not specialised instances of the central subcategory, but variants of it. The extensions of the central model are not random, but motivated by the central model plus certain general principles of extension. One of the advantages of this approach if compared with classical models is that it offers adequate means of characterising the situations where one or more senses are central or more representative.

ICMs are complex structured wholes or *gestalts*. They do not necessarily fit the world very precisely. There will always be some segments of society that the ICM fits reasonably well and some others that it will not.

Polysemy is therefore the result of the extension of ICMs to form radial categories²⁸. Sometimes, a single ICM can be the basis for a collection of senses that form a single natural category. For instance, the ICM of the lexeme *window*²⁹ can take three meanings: ‘an opening in the wall’, ‘a frame fitting into the wall’ and ‘the glass filling the frame fitting into the wall’. These three senses are not unrelated; they form a natural category of senses, where correspondences remain physical. These correspondences have been explained in terms of ‘image schemata’; i.e. recurring structures of, or in, our perceptual interactions, bodily experiences and cognitive operations (Johnson 1987: 79, see Section 1.1.2 above).

In some other cases, these correspondences do not take place within the same ICM, but between the ICMs of two domains. Lakoff and Johnson (1980) propose ‘conceptual metaphor’ as one of the means for relating the different senses of a word. Metaphor is understood as an experientially-based mapping from an ICM in one domain to an ICM in another domain³⁰.

This model of polysemy has been explored mainly with respect to prepositions, where analyses such as Brugman (1981, 1988), Lindner (1982), Herskovits (1987) and Vandeloise (1991) have shown the regularities and motivation among the different senses that prepositions can convey. But as we will see in Chapter 4, it has also been applied to the study of polysemy and semantic change in other semantic fields such as perception verbs. Sweetser (1990) identifies this metaphorical mapping of two different domains in the semantic development of perception verbs. The mappings between the physical and the mental domains are

²⁸ Although I focus only on the radial model in this section this does not mean that Cognitive Semantics rejects the totality of other approaches such as inheritance models. These are accepted as long as they fit the facts (see Langacker 1991b: Ch.1). For instance, in the case of the chain VEHICLE-CAR-SPORTS CAR, the fact that CAR inherits from VEHICLE the attribute ‘means of transportation’, and SPORTS CAR inherits all the features of CAR does not create any problem for Cognitive Semantics (I owe this insight to Barcelona p.c.)

²⁹ As will be seen later, Pustejovsky (1995) calls this type of polysemy ‘complementary polysemy’, i.e. where the alternative readings are manifestations of the same core sense in different contexts.

³⁰ For a full account of different types of ICMs, see Lakoff (1987: 281ff.).

viewed as an important influence in the historical development of polysemy and of cognate words in related languages.

The way in which Cognitive Semantics tackles polysemy provides us with a framework that explains and shows that meanings are not grouped together under the same lexical item by chance. There is bodily-based motivation that causes and organises radial categories of meanings. These radial categories are structured by means of metaphor and metonymy. In this thesis I will use this model to explain why perception verbs have the polysemous senses that they seem to convey.

This framework offers a good model for the explanation of why polysemous senses are grouped together under the same lexical item. Its major drawback, however, is that it does not seem to focus on how these polysemous senses are created. In other words, what it takes to create polysemy, the semantic content of just one lexical item, or the semantic content of that lexical item in conjunction with the semantic content of other lexical items. As stated in the introduction to this chapter, this point is central to my discussion in this thesis³¹. Cognitive Semantics does not provide a sound answer, and therefore, we need to find a different model that does. In the following section I sketch the main tenets of an approach that focuses precisely on this last issue: Pustejovsky's Generative Lexicon.

1.2.3. LEXICAL SEMANTICS AND THE GENERATIVE LEXICON

The 'Generative Lexicon' is Pustejovsky's (1995) approach to the problem of lexical ambiguity, to the multiplicity of word meaning and to the question of how we are able to give an infinite number of senses to words using finite means. The main thesis of this approach is that a core set of word senses is used to generate a larger set of word senses when individual lexical items are combined with others in phrases and clauses. This system has four levels (argument structure, event structure, qualia structure and lexical inheritance structure) which are connected by generative devices (type coercion, selective binding and co-composition) that provide the compositional interpretation of words in context.

³¹ Chapter 7 is devoted entirely to this issue.

Pustejovsky argues that former approaches to natural language semantics have ignored either the problem of how words are used in novel contexts or the creation of such new senses on the basis of compositionality. In language, words can have more than one meaning, but the means in which this extension of meaning is carried out can vary. Based on Weinreich's (1963, 1964) two types of ambiguity, Pustejovsky distinguishes between contrastive and complementary ambiguity.

'Contrastive ambiguity', traditionally known as homonymy, takes place when a lexical item accidentally takes two distinct and unrelated meanings. Pustejovsky is not interested in the reasons (historical, orthographical...) why this arbitrary association of senses occurs, as they are not relevant for the lexicon construction and the synchronic study of meaning (cf. Lyons 1977), but in the various processes that can disambiguate lexical items with this type of ambiguity. He proposes the following three processes:

- (i) Pragmatically constrained disambiguation: when the comprehension of the utterance is performed in a specific context.
- (ii) Priming and context setting: disambiguation by virtue of the discourse within which the sentence appears.
- (iii) Sortally constrained disambiguation: the knowledge of the predication relation in the sentence.

The other type of ambiguity is 'complementary polysemy': when lexical senses are manifestations of the same basic meaning of the word as it occurs in different contexts. He distinguishes between those cases where the category of the lexical item changes and those where it does not; the latter is what he calls 'logical polysemy'.

These multiple senses of a word have overlapping, dependent or shared meanings and seem to be systematically related. In the cases of nominals, Pustejovsky proposes seven different types of alternations: count / mass, container / containee, figure / ground³², product / producer, plant / food, process / result, place /

³² An interesting example for this alternation is the 'animal grinding' as discussed in Pelletier and Schubert (1986) and Copestake and Briscoe (1996).

people. The appropriate interpretation depends on the context. For instance, in the case of figure / ground reversals³³:

- (5) a. The *window* is rotting
 b. Mary crawled through the *window*

The ambiguity of *window* as ‘physical object’ and ‘aperture’ and the choice of one of the interpretations in each sentence is determined by the context in which these sentences have been uttered.

In the case of adjectives, the logical polysemy depends on what the adjective modifies; and finally, in verbs, it depends on the multiple complement types they select, as for example in the case of inchoative and causative verbs.

The main difference between these types of ambiguity lies in the manner in which the senses are related. In contrastive ambiguity both senses are contradictory in nature, i.e. one is available only if every other sense is not. In complementary polysemy, on the other hand, there is a weaker shadowing effect, both senses are relevant for the interpretation of the lexical item in context, but one seems to be focused for purposes of a particular context.

This is why Pustejovsky (1991, 1995: 39ff.) argues that the distinction between these ambiguities is necessary and rejects other approaches such as the ‘Sense Enumeration Lexicon’ (cf. Hirst 1987), where such a distinction is waived. The advantage of this type of approach is that the lexicon remains a separate and independent source of data. It is insufficient, however, when accounting for the creative use of words (new senses in novel contexts), the permeability of word senses (not atomic definitions but overlap and make reference to other senses of the word) and the expression of multiple syntactic forms (a single word sense can have multiple syntactic realisations).

Logical polysemy has also been discussed by Briscoe and Copestake (1991) and Copestake and Briscoe (1996) under the name of ‘constructional polysemy’ and defined as one lexical item with apparent ambiguities that arise from a process of co-

³³ The phenomenon of figure / ground, first introduced by the Gestalt psychology, is at the very centre of the Cognitive Linguistics approach, see Talmy (1978), Langacker (1987, 1991a).

composition in the syntax. This case is more apparent than real because lexically, there is only one sense and it is the process of syntagmatic co-composition (Pustejovsky 1991) that causes the sense modulation. Their approach is similar to that of Pustejovsky (1995), but they also provide a formal mechanism for treating the compositional interpretation derived from the qualia as defeasible knowledge. Copestake and Briscoe (1996) also proposed another type of polysemy called ‘sense extension’. In this case, a lexical item is predictably related to two or more senses. It is not a sense modulation but a sense change, and therefore, they argue that it requires lexical rules that can create the derived senses from basic senses, together with specific conditions related to the speaker and context.

Yet another type of sense extension not included in Pustejovsky’s analysis is ‘referential transfer’, i.e. when a name of a property is mapped into a new name denoting a property to which it functionally corresponds. This phenomenon has been addressed in Fauconnier (1985) and Nunberg’s (1996) ‘predicate transfers’, which Nunberg argues are licensed pragmatically.

Pustejovsky’s Generative Lexicon proposes a model that addresses the question – neglected by Cognitive Semantics – of how senses are created. It states that a core set of word senses is used to generate a larger set of word senses when individual lexical items are combined with others in phrases and clauses. Although Pustejovsky is mainly concerned with non-metaphorical meanings, it seems an appropriate model to account for the way in which polysemy is created. In Chapter 4, I apply this model to the analysis of the polysemous senses in perception verbs.

1.2.4. SUMMARY

In this section, three approaches to polysemy have been presented. The traditional approach defines polysemy as the case when a lexical item has a range of different meanings. Polysemy can be differentiated from homonymy by using a set of criteria, such as the etymology, the unrelatedness of meaning, the central or core meaning as well as some ambiguity tests. It has been argued that this model is mainly concerned with a descriptive analysis of polysemy, without addressing questions such as why and how polysemy is created.

For Cognitive Semantics, a lexical item is polysemous when it has multiple meanings related in a systematic way. This framework provides a good explanation for the reasons why meanings are related to specific lexical items, but it fails to account for the way in which such polysemous senses are created.

The last approach is Pustejovsky's Generative Lexicon. Polysemous senses are understood as manifestations of the same basic meaning in different contexts. A strong compositionality model, consisting of four levels of representation for a lexical item, and generative connecting devices explains these senses. This framework seems the most suitable for explaining how the semantic content of different lexical items interacts in order to create polysemous senses.

1.3. ORGANISATION OF THE THESIS

This introductory chapter has set out the nature and scope of the work, explaining the purpose of examining the domain of perception verbs, and outlining the theoretical context and orientation of the study. Chapter 2 presents a synchronic typological study of the different meanings that perception verbs can convey in the three languages under investigation: English, Basque and Spanish. These data will be used in support and illustration of the discussions in the various parts of the study. Firstly, this chapter will focus on the prototypical physical meanings in perception verbs; their classification according to the semantic roles of the arguments that those verbs take, and the hierarchies that have been established in this semantic field. Secondly, it will offer a detailed account of the different non-prototypical extended meanings, both physical and metaphorical, that these verbs can convey from a cross-linguistic point of view. It will also include polysemous senses that are only particular to each of these languages.

Chapter 3 is a brief diachronic-etymological account of these perception verbs in these three languages. This chapter aims to provide further support for some of the theoretical claims put forward in the course of this thesis, not to discuss in detail either how or why these perception verbs have evolved the way they have, or what their etymological origin is – this falls beyond the scope of this thesis.

Chapter 4 reviews two approaches to meaning extension. Sweetser's (1990) semantic account of perception verbs, and Pustejovsky's (1995) Generative Lexicon. It sets out the advantages and gaps that need to be addressed in both approaches.

Chapter 5 describes the physiology of the five senses and the way in which human beings perceive these perceptual processes. I present a typology of the properties that characterise the source domain of sense perception. This typology is considered to be the bodily basis that motivates the different mappings originated from the physical domain of perception.

In Chapter 6 I investigate how extended meanings derived from the source domain of physical perception, both physical and metaphorical, are constrained by the typology of properties described in Chapter 5. I introduce the processes called 'Property Selection' which show what properties are transferred from one domain of experience onto the other.

Chapter 7 explores the question of how the polysemous senses of perception verbs are obtained: Are they the result of the meaning of the perception verb only, or the result of the interaction between the semantics of that verb and the other elements that co-occur in the same sentence? It also explains the implications for the study of cross-linguistic polysemy.

In Chapter 8 I summarise the main findings in this thesis and propose a new model for the analysis of polysemy. This model is composed of two complementary parts: (i) 'Conceptual Polysemy' explains the different conceptual mappings that exist between different domains of experience; (ii) 'Graduable Polysemy' explains how these conceptual mappings are overtly expressed by lexical items in different languages. Finally, I point out other areas for further research.

CHAPTER 2: THE SEMANTIC FIELD OF SENSE PERCEPTION

Perception verbs have supplied a rich field of research in linguistics: grammaticalisation (Heine *et al.*, 1991), complementation (Horie 1993) and semantic change (Sweetser 1990). In this chapter, I analyse the different meanings that perception verbs can convey in the three different languages under investigation: English, Basque and Spanish.

The organisation of this chapter is as follows: Section 2.1 describes the sources of the language material used in this thesis. Section 2.2 focuses on the prototypical physical meanings in perception verbs; their classification according to the semantic roles of the arguments that these verbs take and the hierarchies that have been established in this semantic field. Section 2.3 offers an account of the different non-prototypical extended meanings that these verbs can convey from a cross-linguistic point of view. Section 2.4 summarises the results from previous sections.

2.1. SOURCES OF THE LANGUAGE MATERIAL

The linguistic material used in support and illustration of the discussions in the various parts of the study belongs to three different sources.

(i) Monolingual and bilingual dictionaries. The dictionaries that I have made use of when writing this thesis are listed as a particular subgroup in the Bibliography section. These examples are followed by an abbreviated reference within brackets.

(ii) Corpora of written Basque and Spanish³⁴. Present-day Basque Reference Corpus (EEBS)³⁵ is the corpus used for Basque. EEBS is made available by the

³⁴ English corpora, although consulted, have not been used as sources of language material. I decided not to use these corpora because I considered that the dictionaries available provided enough data to illustrate the main ideas put forward in this thesis. This was not the case in Basque and Spanish either because there were not enough dictionaries at my disposal or because these dictionaries did not offer enough examples. Although I am aware that the lack of English corpora may be an important imbalance in the case of a more quantitative kind of research (for instance, a study of the frequencies in the use of polysemous senses), it does not affect the results obtained in this case.

Basque Centre for Terminology and Lexicography (UZEI) and the Royal Academy of the Basque Language (Euskaltzaindia). This corpus contains everything published in Basque from 1900 to 1995, and it is updated annually. It makes up to a total of 3,553,000 forms. Reference Corpus for Present-day Spanish (CREA³⁶) is the corpus used for Spanish. CREA is provided by the Institute for Lexicography at the Royal Academy of the Spanish Language. This corpus contains literary, journalistic, scientific and technical texts, transcriptions from spoken language and from media broadcasts. A total of 200 million words. These examples are also followed by an abbreviated reference within brackets.

(iii) Examples that occur without any bracketed indication of the source have for the most part been constructed by me, occasionally on the basis of an utterance that I have seen or heard used. In addition, some of them have been taken from other linguistic studies, and whenever I can straightforwardly pinpoint the origin of such specially invented examples, I shall do so either in a note or in the accompanying text. I have always consulted native speakers concerning the naturalness of these examples.

Being the result of a dictionary/corpus-based study, the analyses offered cannot represent one individual's linguistic system. They can only reflect language use in a given community. Consequently, individual native speaker's intuitions may deviate from the proposed analyses sometimes. These cases are indicated in the discussion.

I would also like to point out that the main aim of this study is not to show how frequent or salient the meanings presented are in each language, but just the fact that it is possible to infer them. Therefore, I have not included any data on frequencies.

2.2. PHYSICAL MEANINGS IN PERCEPTION VERBS

2.2.1. SEMANTIC CLASSIFICATIONS OF PERCEPTION VERBS

The semantic field of perception has five components: vision, hearing, touch, smell and taste. Although the label 'perception' refers to verbs such as *see*, *look*,

³⁶ 'Corpus de Referencia del Español Actual'.

hear, listen, sound, smell, touch, feel and *taste* among others, as an overall group it is very important for our analysis to bear in mind that these verbs can be classified in three different groups according to the semantic role of their subjects.

The first group of verbs is traditionally described as “the receiving of an expression by the senses independently of the will of the person concerned” (Poutsma 1926: 341). As for instance example (1) shows:

- (1) a. Peter *saw* the birds³⁷.
 b. Peter *heard* the birds.
 c. Peter *felt* a stone under his foot.
 d. Peter *smelled* cigars in the room.
 e. Peter *tasted* garlic in the food.

In (1), the subject does not consciously control the stimuli; it refers to a state or inchoative achievement. The process described in each of the verbs used in this set of examples, namely *see, hear, smell, feel, taste*, is that of the perception of various phenomena via the relevant sense organ: eye, ear, skin, nose and mouth (taste buds) respectively.

This set of verbs is called ‘passive perception’ (Palmer 1966: 99), ‘inner perception’ (Leech 1971: 23), ‘cognition’³⁸ (Rogers 1971: 206, 1972: 304), ‘stative with experiencer subject’ (Lehrer 1990: 223), and ‘experience’ (Viberg 1984: 123).

The second group of verbs is those exemplified in (2):

- (2) a. Peter *looked* at the birds.
 b. Peter *listened* to the birds.
 c. Peter *felt* the cloth (/to see how soft it was/³⁹).
 d. Peter *smelled* the cigar (/to see if he could smoke it/).

³⁷ The examples in (1), and those in (2) and (4) below, are all taken from Viberg (1984).

³⁸ In his thesis, Rogers (1973) divides this type of verbs into two classes: stative and inchoative.

³⁹ / / is the test frame.

- e. Peter *tasted* the food (/to see if he could eat it/).

These verbs are called ‘active perception verbs’ (Poutsma 1926: 341; Leech 1971: 23; Rogers 1971: 206, 1972: 304), ‘active experiencer subject’ (Lehrer 1990: 223), and ‘active’ (Viberg 1984: 123). They refer to an “unbounded process that is consciously controlled by a human agent” (Viberg 1984: 123).

In order to distinguish between these two groups Gisborne (1996: 1) proposes the ‘*deliberately* test’. He assumes that those verbs that can occur with the adverb are to be classified as ‘agentive’ (active) verbs, whereas those verbs that do not readily occur with this adverb are examples of involuntary perception.

For instance (from Gisborne 1996: 1),

- (3) a. Jane was *deliberately* listening to the music.
 b. *Jane *deliberately* heard the music.

As the verb *listen* in (3a) accepts the adverb *deliberately*, it can be classified as an agentive verb; while in (3b) the infelicity of this adverb with *hear* indicates that it is an experience verb.

The last group is formed by those verbs whose subjects are the stimuli of the perception as illustrated in (4).

- (4) a. Peter *looked* happy.
 b. Peter *sounded* happy.
 c. The cloth *felt* soft.
 d. Peter *smelled* good / of cigars.
 e. The food *tasted* good / of garlic.

This group is called ‘flip verbs’ (Rogers 1971: 206, 1972: 304), ‘stimulus subject’ (Lehrer 1990: 223), ‘copulative’ (Viberg 1984: 123), and ‘percept’ (Gisborne 1996:1).

Viberg (1984) establishes the differences between experience and activity verbs on the one hand and copulative verbs on the other, on the basis of what he calls

‘base selection’, i.e. the choice of grammatical subject among the deep semantic case roles associated with a certain verb. In the former case, verbs are ‘experiencer-based’; that is to say the verb takes an animate being with certain mental experience as a subject. In the latter case, verbs are ‘source-based’ or ‘phenomenon-based’, as the verb takes the experienced entity as a subject.

As seen from the description of each group above, these different types of perception verbs receive different terms according to different authors⁴⁰. In this study, I follow Viberg’s terminology for the experiencer-based verbs (i.e. active and experience) and Gisborne’s for the source-based ones (i.e. percept). Therefore the basic⁴¹ paradigm of the verbs of perception in English is shown in Table 2.1.

SENSE MODALITY	EXPERIENCE	ACTIVITY	PERCEPT
VISION	<i>See</i>	<i>Look</i>	<i>Look</i>
HEARING	<i>Hear</i>	<i>Listen</i>	<i>Sound</i>
TOUCH	<i>Feel / Touch</i>	<i>Touch / Feel</i>	<i>Feel</i>
SMELL	<i>Smell</i>	<i>Smell / Sniff</i>	<i>Smell</i>
TASTE	<i>Taste</i>	<i>Taste</i>	<i>Taste</i>

Table 2.1: The basic paradigm of verbs of perception in English.

It is important to notice in the verbs presented in Table 2.1 that in cases such as hearing there is a different verb belonging to this sense perception for each group. In the other cases however, there are not different lexical items for each group. This does not imply that the distinction between experience, activity, and percept is less important in these cases (Miller and Johnson-Laird 1976: 618), but that, as Lehrer (1990: 223) points out, only one polysemous verb corresponds to the three of them.

These three groups represent the three possible prototypical meanings that perception verbs can convey. As introduced in Chapter 1, ‘prototype’ is the typical

⁴⁰ See Rogers (1973) and Kryk (1979) for a critical survey of such classifications.

⁴¹ The verbs presented in this table are by no means the only verbs that can be included in the semantic field of perception; other verbs such as *watch*, *gaze*, *observe*, *notice*, *hearken*, *stink*, *stench*, *savour*, *smack*, among others could have been included. However, I have selected only the most common, neutral, and prototypical perception verbs for English, as well as for Basque and Spanish in the following section, because they are free from any specific connotations about the way in which the perceptual act is being carried out.

member of a category to which other members are related in a motivated way. It is in this sense that I call these physical meanings prototypical⁴².

2.2.2. CROSS-LINGUISTIC DATA: BASQUE AND SPANISH

In the previous section it is shown how perception verbs are classified in three groups according to the semantic role of the subject the verb takes. In Table 2.1 above, the basic paradigm for perception verbs in English is presented. In this section, I apply this classification to perception verbs in the other two languages under investigation: Basque and Spanish.

2.2.2.1. Basque Perception Verbs

Table 2.2 shows the basic perception verbs in Basque.

SENSE MODALITY	EXPERIENCE	ACTIVITY	PERCEPT
VISION	<i>Ikusi</i>	<i>Begiratu</i>	--- (<i>Iruditu</i>)
HEARING	<i>Entzun / Aditu</i>	<i>Entzun / Aditu</i>	---
TOUCH	--- (<i>Susmatu / Nabaritu</i>)	<i>Ukitu</i>	---
SMELL	<i>Usaindu</i>	<i>Usnatu / Usaindu</i>	---(<i>Usain eduki erion</i>)
TASTE	<i>Dastatu (Sumatu / Nabaritu)</i>	<i>Dastatu</i>	<i>Dastatu (Zapore Gustu eduki)</i>

Table 2.2: The basic paradigm of verbs of perception in Basque.

These experiencer verbs in Basque are illustrated in (5) below:

- (5) a. Pellok txoriak *ikusi* zituen
 peter.ERG bird.ABS.PL see AUX
 ‘Peter saw the birds’
- b. Pellok txoriak *entzun* zituen
 peter.ERG bird.ABS.PL hear AUX
 ‘Peter heard the birds’

⁴² What I call here ‘prototypical’ meaning has been referred to by other authors as ‘ideal’ meaning (Herskovits 1986), and ‘primary nuclear sense’ (Austin 1961).

- c. Pellok harri bat *sumatu* zuen bere
oinpean
peter.ERG stone one perceive AUX his
footunder.INE
'Peter felt a stone under his feet'
- d. Pellok puruak *usaitu* zituen gelan
peter.ERG cigar.ABS.PL smell AUX room.INE
'Peter smelled cigars in the room'
- e. Pellok baratzuria *dastatu* zuen janarian
peter.ERG garlic.ABS taste AUX food.INE
'Peter tasted garlic in the food'

In the first group of experiencer verbs Basque has a lexical item for every sense except for the sense of touch, where the verbs *sumatu* and *nabaritu* are to be used. These verbs both mean 'to perceive' and 'to notice'. Although both verbs refer to general perception, it is very interesting to notice that the verb *sumatu* is related to the sense of smell. This verb comes from the noun *suma*, which means 'smell, sense of smell' (See Chapter 3). According to Viberg's (1983, 1984) lexicalisation hierarchy in (6) below, a verb having a basic meaning belonging to a sense modality higher in the hierarchy can get an extended meaning that covers some, or all, of the sense modalities lower in the hierarchy.

- (6) sight > hearing > touch > smell / taste

Based on this hierarchy, languages are classified in respect to the number of senses that they can lexicalise. For instance, English has the five modalities: *see*, *hear*, *feel*, *taste* and *smell*; Malay has four: *lihat* 'vision', *dengar* 'hearing', *rasa* 'feel, taste' and *hidu* 'smell'; Swedish has three *se* 'vision', *höra* 'hearing' and *känna* 'feel, taste, smell'. Basque is included in the group of languages with only three senses. Although *sumatu* no longer means 'to smell', the fact that it is derived from *suma* 'smell' seems to contradict Viberg's hierarchy at least in the case of Basque. This is because it is a verb from the sense of smell that is used for the sense of touch,

which is higher up in the hierarchy. As a consequence, it cannot be included in the same group of languages as Swedish.

For the group of activity verbs Basque has a complete paradigm as illustrated in (7) below:

- (7) a. Pellok txoriei *begiratu* zien
 peter.ERG bird.DAT.PL look AUX
 ‘Peter looked at the birds’
- b. Pellok txoriei *entzun* zien⁴³
 peter.ERG bird.DAT.PL listen AUX
 ‘Peter listened to the birds’
- c. Pellok oihala *ukitu* zuen
 peter.ERG cloth.ABS touch AUX
 ‘Peter felt the cloth (/to see how soft it was/)
- d. Pellok purua *usaindu* zuen
 peter.ERG cigar.ABS smell AUX
 ‘Peter smelled the cigar (/to see if he could smoke it/)
- e. Pellok janaria *dastatu* zuen
 peter.ERG food.ABS taste AUX
 ‘Peter tasted the food (/to see if he could eat it/)

In the case of percept verbs Basque is relatively poor. The sense of taste is the only one that can be lexicalised by means of a perception verb as example (8.c) shows. In the other cases it is necessary to use a related verb, e.g. *iruditu* ‘seem’, as

⁴³ Although (7.b) is correct in Basque, native speakers feel more comfortable if the noun *kantu* ‘song’ is included as in (7.b’):

(7.b’) Pellok txorien kantua *entzun* zuen
 peter.ERG bird.GEN.PL song.ABS listen AUX
 ‘Peter listened to the birds’ song’



in vision (8.a); or a perception noun followed by the verb *eduki* ‘to have’ as in the sense of smell (8.b) and also taste⁴⁴ (8.d), (8.e).

- (8) a. Pellok pozik *zirudien*
 peter.ERG happy seemed
 ‘Peter seemed happy’
- b. Pellok *usain* ona / puru *usaina* zeukan
 peter.ERG smell good.ABS / cigar smell.ABS had
 ‘Peter smelled good / smelled of cigars’ (lit. Peter had a good
 smell / a smell of cigars)
- c. Janariak ondo *dastatu* zuen
 food.ERG well taste AUX
 ‘The food tasted good’
- d. Janariak *gustu* ona zeukan
 food.ERG taste good.ABS had
 ‘The food had a good taste’
- e. Janariak baratzuri *zaporea* zeukan.
 food.ERG garlic taste.ABS had
 ‘The food had garlic taste’

In sum, Basque has a different lexical item for all experiencer perception verbs but touch. This sense modality is covered by a verb that refers to general perception instead. Basque has a different lexical item for each activity perception verb like English, but it lacks percept verbs except for the case of taste.

⁴⁴ Note that *gustu* and *zapora* are borrowings from Romance. This is a further indication of the poverty of Basque in terms of percept verbs.

2.2.2.2. Spanish Perception Verbs

The basic paradigm of verbs of perception in Spanish is shown in Table 2.3.

SENSE MODALITY	EXPERIENCE	ACTIVITY	PERCEPT
VISION	<i>Ver</i>	<i>Mirar</i>	--- (<i>Parecer</i>)
HEARING	<i>Oír</i>	<i>Escuchar</i>	<i>Sonar</i>
TOUCH	<i>Tocar / Sentir</i>	<i>Tocar</i>	--- (<i>tener un tacto</i>)
SMELL	<i>Oler</i>	<i>Olfatear / Husmear / Oler</i>	<i>Oler a</i>
TASTE	--- (<i>Notar</i>)	--- (<i>Probar</i>)	<i>Saber a</i>

Table 2.3: The basic paradigm of verbs of perception in Spanish.

In the group of experiencer verbs Spanish has a verbal lexical item for each perception⁴⁵ except for the sense of taste as illustrated in (9). In the sense of taste it is necessary to use the verb *notar* ‘perceive’.

- (9) a. Pedro *vió* los pájaros
 peter saw the birds
 ‘Peter saw the birds’
- b. Pedro *oyó* los pájaros
 peter heard the birds
 ‘Peter heard the birds’
- c. Pedro *sintió* una piedra debajo de su pié
 peter felt one stone under of his foot
 ‘Peter felt a stone under his foot’
- d. Pedro *olió* el puro en la habitación
 peter smelled the cigar in the room
 ‘Peter smelled the cigar in the room’

⁴⁵ In (9.c) the verb used is *sentir* ‘feel’. The verb *sentir* in Spanish is the verb that describes general perception. Although in this example a tactile verb is not possible, as will be shown in the

- e. Pedro *notó* el ajo en la comida
 peter felt the garlic in the food
 ‘Peter tasted garlic in the food’

The second group of verbs, the activity verbs, has a verbal lexical item for every sense except for the sense of taste as exemplified in (10). In the sense of taste it is necessary to use the verb *probar* ‘try’.

- (10) a. Pedro *miró* los pájaros
 peter looked the birds
 ‘Peter looked at the birds’
- b. Pedro *escuchó* los pájaros
 peter listened the birds
 ‘Peter listened to the birds’
- c. Pedro *tocó* la tela
 peter touched the cloth
 ‘Peter felt the cloth (/to see how soft it was/)
- d. Pedro *olió* el puro
 peter smelled the cigar
 ‘Peter smelled the cigar (/to see if he could smoke it/)
- e. Pedro *probó* la comida
 peter tried the food
 ‘Peter tasted the food (/to see if he could eat it/)

The last group of percept verbs is possible for hearing, smell and taste. In the case of vision it is necessary to use the verb *parecer* ‘to seem’; and in both touch and

next section, where the extended meanings of these verbs are analysed, it is possible to use the verb *tocar* ‘touch’ as an experiencer verb, in the sense of ‘be in contact with’.

taste the construction ‘perception noun + verb *tener* ‘to have’ is to be used in order to express such concepts.

- (11) a. Pedro *parecía* contento
 peter seemed happy
 ‘Peter looked happy’
- b. Pedro *sonaba* preocupado⁴⁶
 peter sounded worried
 ‘Peter sounded worried’
- c. La tela tenía un *tacto* suave
 the cloth had a touch soft
 ‘The cloth felt soft’
- d. Pedro *olía* bien / a puro
 peter smelled well / to cigar
 ‘Peter smelled good / of cigars’
- e. La comida *sabía* bien / a ajo
 the food tasted well / to garlic
 ‘The food tasted good / of garlic’
- f. La comida tenía *gusto /sabor* de ajo
 the food had taste the of garlic
 ‘The food tasted of garlic’

Although there seem to be no verbs for the sense of taste in Spanish for the activity and experience cases, this assumption is not accurate. In Spanish there are two main taste verbs, *gustar* and *saber*. As explained in Chapter 3, both verbs come

⁴⁶ The choice of the complements that accompany the verb *sonar* in this case is restrictive. Whereas sentences like *Sonaba bien*, lit. ‘sounded well’ are fully idiomatic, others like *Sonaba contento*, lit. ‘sounded happy’ are not accepted by all native speakers. It is also possible to lexicalise this meaning by using the verb *tener* ‘to have’ followed by the NP *un sonido* ‘a sound’ + adj.

from Latin. *Saber* comes from Lat. *sapere* ‘taste’ and ‘be wise’ and the meaning ‘to have a taste’ is only preserved in Italian and in the Iberian romances. *Gustar* comes from Lat. *gustâre* ‘taste’. Although in Middle Spanish it was used as a prototypical activity verb, nowadays its meaning has shifted to ‘to enjoy’. Roque-Barcía (1902) distinguishes these two verbs on the basis of sensibility. *Gustar* refers to the action of the gustative organs, whereas *saber* refers to the pleasure or pain that we feel when we are tasting, i.e. *saber* is related to sensibility. *Gustar* seems to be a condition to *saber*, because without *gustar* something, one cannot *saborear* it.

Summarising, in the case of experiencer and activity verbs, Spanish has a verbal lexical item for each sense perception except for the sense of taste. In respect to percept verbs, there are different verbal lexical items for hearing, smell, and touch only.

2.2.3. SUMMARY

In this section the main prototypical physical meanings of the verbs in the semantic field of perception in Basque, English and Spanish have been established. Following Viberg’s (1984) and Gisborne’s (1996) classification of perception verbs on the basis of the semantic role of their subjects, perception verbs are divided into three groups: experience, activity and percept. In the following section the non-prototypical meanings of these verbs in these three languages are presented.

2.3. NON-PROTOTYPICAL MEANINGS IN PERCEPTION VERBS

In this section I analyse the non-prototypical meanings in perception verbs in Basque, English and Spanish. Non-prototypical meanings are all those extended meanings, both physical and metaphorical, that these verbs can convey apart from the central prototypical meaning of physical perception as explained in Section 2.2. In this analysis, I focus on activity and experience verbs only. I do not include percept verbs because, unlike in English, they are relatively poor in Spanish and almost non-existent in Basque. Whereas activity and experience verbs have verbal lexical items for almost every sense in the three languages, (see in Section 2.2.2), percept verbs are mostly lexicalised either by a perception noun followed by a verb,

or by a non-perception verb. In order to avoid any possible imbalance that this lack of percept verbs may have caused in the results of the analysis, I leave them outside this study.

It is important to point out that in the following sections I do not consider some of the more complex uses of perception verbs with different types of complementation⁴⁷. In other words, I do not study the functional dependency between different syntactic types of complements and the entities that they encode in each case. Entities refer to the different levels of abstraction involved when we categorise the structure of the world. These different levels have been given a variety of names in the literature. Vendler (1967, 1970) distinguishes between ‘objects’, ‘events’, and ‘propositions’. Lyons (1977) between ‘first’, ‘second’ and ‘third order’ entities. Horie (1993) between ‘objects’, ‘directly perceived events’, and ‘indirectly perceived events’. Dik and Hengeveld (1991) between the ‘immediate perception of an individual’, the ‘immediate perception of a state-of-affairs’, the ‘mental perception of propositional content’, and the ‘reception of the propositional content of a speech act’.

Studies⁴⁸ have shown that there is a correlation between the type of syntactic complement the perception verb takes and the entity encoded in each case. That is to say, it seems that there is a relationship between the systematic meaning extensions of perception verbs in the cognitive domain with the type of complement they take.

Observe the following examples:

(12) John saw the car

(13) John saw Mary crossing the street

(14) John saw that Mary crossed the street

In (12) the complement is the noun phrase *the car* which corresponds to what Lyons’ calls ‘first order entity’, a physical object. In (12) we understand that John physically perceived a car with his eyes. In (13) the complement is a non-finite

⁴⁷ See Noonan (1985) for more information about complementation. I would like to thank Keith Mitchell for showing me how interesting perception verb complements can be.

sentence, the gerund *crossing the street*. The meaning is still perceptual: John physically perceived with his eyes an event, i.e. Mary crossing the street. This complement corresponds to the ‘second order entities’. The complement in (14) is a finite clause. In this case the meaning of the sentence is not perceptual; John did not see Mary walking from one side of the street to the other. What John saw is that Mary was already on the other side and he deduced that she had crossed the street. In other words, the verb *to see* does not encode the acquisition of sense data through the eyes, but the mental manipulation of an information gathered by the eyes. Therefore, there is a semantic extension from perception to cognition.

The systematic relationship between the semantics and the syntax of perception verb complements has been discussed in a number of studies in respect to several languages (see references above). This area, however, falls beyond the scope of the present thesis, which is focused on a semantic description of perception verbs.

For each sense, first of all I discuss those extended meanings that are cross-linguistic, and then I mention other extended meanings particular to each language under investigation.

2.3.1. VISION

Vision is by far the most studied sense of the five. The semantic field of sight has been analysed not only from the point of view of polysemy (Bauer 1949; Prévot 1935; García Hernández 1976; Alm-Arvius 1993) but also from the language acquisition perspective (Landau and Gleitman 1985; C. Johnson 1999). In this section I present a summary of the main extended meanings that vision verbs convey cross-linguistically and in Basque, English and Spanish in particular.

The verbs used for the following analysis are *see* and *look* in English, *ikusi* and *begiratu* in Basque, and *ver* and *mirar* in Spanish.

Due to the vast number of extended meanings possible in this sense I have organised them into 4 groups. The first group of extended meanings is that which relates physical vision with the intellect or mental activity. Within this group, the

⁴⁸ See Caplan (1973), Bolinger (1974), Cooper (1974 a,b), Kirsner and Thompson (1976), Declerk (1981), Vlach (1983), Dik and Hengeveld (1991), Horie (1993), Mönnich (Ms.), Schüle (Ms.), among many others.

following meanings ‘to understand’, ‘to foresee’, ‘to visualise’, ‘to regard’, ‘to imagine’, ‘to revise’, and ‘to meditate’ are included.

The meaning ‘to understand’ is illustrated in (15), (16) and (17) below:

(15) I explained the problem but he could not *see* it (COL)

(16) Orduan(nik) ez nuen *ikusi* (berak)zer esan
nahi zuen

then I.ERG NEG AUX see he.ERG what say
want aux.COMP

‘I didn’t see at the time what he wanted to say’ (ELH)

(17) Es una manera apresurada de *ver* las
cosas

is a way hasty of see the
things

‘It’s a very hasty way to see things’ (CREA)

Another meaning belonging to this group is ‘to foresee’ as in (18), (19) and (20).

(18) I can *see* what will happen if you don’t help (COL)

(19) Peiori gertatu zaiona aurretik *ikusi* nuen nik

peter.DAT happen AUX.REL.ABS before.ABL see AUX I.ERG

‘I already foresaw what has happened to Peter’

(20) Estoy *viendo* que mi hermano llega sin avisar

am seeing COMP my brother arrives without notify

‘I can see he is going to come without letting us know’ (RAE)

In these three examples we foresee what is going to happen before it actually takes place. In the case of Basque, it is necessary to add the word *aurretik* ‘before’ in order to infer this meaning. Otherwise the verb takes the physical meaning ‘to witness’.

Another meaning in this group is ‘to imagine’, and ‘to visualise’. In this case, what we see in our imagination is something that has not taken place yet.

(21) I can’t *see* him as a teacher (AM)

(22) Esta chica ya se ve estrella de
 cine

this girl already she.REFL sees star of
 cinema

‘This girl already imagines herself a film star’ (LAR)

(23) (Guk) Geure buruak galdurik ikusi genituen

we.ERG our head.ABS.PL lost see AUX

‘We saw ourselves lost’ (IS)

Another meaning in this group is ‘to consider’, ‘to regard’, and ‘to judge’ as in (24), (25) and (26).

(24) Many *saw* her as a world leader (AM)

(25) Nola ikusten duzu gure arazoa?

how see.HAB AUX our problem.ABS

‘How do you see our problem?’ (ELH)

(26) No le veo nada malo

NEG he.DAT see.1.SG nothing bad

‘I can’t see anything wrong with it’ (OSD)

Finally, the last meaning in this group is ‘to revise’, and ‘to study’.

(27) I have to *see* how I fix it (OSD)

(28) Zuk ekarritako dokumentuak ikusten ari naiz

you.ERG bring.REL document.ABS.PL see.HAB be busy AUX

‘I’m revising the documents you brought’

- (29) No vimos ese tema en clase
 NEG saw.1.PL that topic in class
 ‘We didn’t look at that topic in class’ (OSD)

The second group is the one that relates vision to social relationships. This group includes meanings such as ‘to meet’, ‘to pay a visit’, ‘to receive’, ‘to get on badly’, ‘to go out with’ and ‘to accompany’, ‘to escort’ (only English).

The first meaning is ‘to meet’. In (30), (31) and (32), what is implied is that these people are not only going to see each other, but that they have made an appointment.

- (30) I’ll *see* you at seven (OSD)

- (31) (Nik zu) Zazpietan ikusiko zaitut tabernan
 I.ERG. you.ABS seven.INE.PL see.FUT AUX pub.INE
 ‘I’ll see you in the pub at seven’

- (32) Se veían un par de veces al mes
 they.REC saw.3.PL a couple of times to.the month
 ‘They used to see each other a couple of times a month’ (OSD)

‘To visit’ is another meaning that can be included in this group. In (33) because the person we are going to visit is a solicitor, it is also implied that we are seeking some advice or that we have some business with him. In the other two cases, (34) and (35), this connotation is not implied.

- (33) I’m going to *see* my solicitor now (COL)

- (34) (Ni) Gaixo nentzan eta (zuek) ikusi ninduzuen
 I.ABS sick was and you.ERG.PL see AUX
 ‘I was sick and you came to see me’ (IS)

- (35) *Todavía no he ido a ver a la abuela*
 still NEG have.1.SG gone to see to the grandmother
 ‘I still haven’t been to see grandmother’ (OSD)

In the examples below *see* means ‘to receive’. This meaning is inferred when the subject of the sentence is a person who usually does not visit other people, but a person who is visited in order to get advice, to have an interview and so on. A person like a doctor⁴⁹ in the examples below, or the president, or the director.

- (36) The doctor will *see* you now (AM)
- (37) *Medikuak orain ikusiko zaitu*
 doctor.ERG now see.FUT AUX
 ‘The doctor will see you now’
- (38) *El doctor lo verá ahora*
 the doctor he.ACC see.FUT now
 ‘The doctor will see you now’ (OSD)

Another meaning in this group is ‘to go out with’. In this case it is necessary to give a time frame for indicating a durative period of time.

- (39) They have been *seeing* each other for a year (AMGD)
- (40) *(Haiek) Ihaz hasi ziren elkar ikusten*
 they.ABS lastyear start AUX REC see.HAB
 ‘They started to see each other last year’

⁴⁹ Doctors do visit their patients, but in these examples it is implied that the patient goes to the practice.

- (41) Se ven desde hace un año
 they.REC see.3.PL since made a year
 ‘They have been seeing each other for a year’

Another meaning is ‘to get on badly’ as in (42), (43) and (44). In this case it is necessary to have a negative construction in order to indicate that the people involved do not get on well.

- (42) They can’t see each other

- (43) (Haiek) Ezin dute elkar ikusi
 they.ERG cannot AUX REFL see
 ‘They can’t see each other’

- (44) No se pueden ni ver
 NEG REC can.3.PL not.even see
 ‘They can’t see each other’

A third group of meanings is that which links vision to reliability, and assurance. Meanings such as ‘to ascertain, to find out’ as in (45), (46) and (47), ‘to make sure’ as in (48), (49) and (50) and ‘to take care’ as in (51), (52) and (53) are included in this group.

- (45) Please see who’s knocking (AM)

- (46) (Hark) Mendiaren gailurrera iritsita behean
 zegoen herri hura ikusi zuen
 he.ERG mountain.GEN top.ALL arrive.PAR down.INE
 was.REL town that.ABS see AUX
 ‘When he reached the top of the mountain he discovered the town
 that was down there’ (ELH)

- (47) Mira a ver quién llama a la puerta
 look to see who calls to the door
 ‘See who’s at the door’

Another meaning included in this group is ‘to make sure’.

(48) *See* that it gets done right away (AM)

(49) *Mira* que los niños hagan los deberes
 look COMP the children do.SUBJ the homeworks
 ‘See that the children do their homework’

Finally the meaning ‘to take care’ is also included in this group.

(50) He *looked*⁵⁰ after his younger brother (AM)

(51) *Begira* iezadazu umea kanpoan nagoen
 bitartean
 look AUX.IMP child.ABS outside.INE am.COMP
 while
 ‘Look after the child while I’m away’ (IS)

(52) *Mira* por tí misma, los demás que se las
 arreglen
 look for you.DAT REFL the others that they.REFL the
 fix.SUBJ.3.PL
 ‘Just take care of yourself, and let the others sort out their own
 problems’ (OSD)

Another meaning possible in vision verbs is ‘to witness’. In this meaning the emphasis is on the person that is looking. This acts as a ‘passive witness’ of the events that happen, i.e. they do not personally take part in what is going on.

(53) He has *seen* much unhappiness in this life⁵¹ (COL)

⁵⁰ In some Southern English dialects, *saw* can be used in this example as in *He saw to his younger brother* (Cann p.c.).

⁵¹ This example can have another interpretation as well. The subject can be a ‘passive witness’ that sees all this unhappiness as an observer, but on the other hand, the subject can be an ‘active witness’ who has experienced this unhappiness in his own flesh (See (60) and (61) below).

- (54) *Vieron* confirmadas sus sospechas
 saw.3.PL confirmed.PL their suspicions
 ‘They saw their suspicions confirmed’ (OSD)

Another possible meaning is ‘to refer to’ as in the examples below:

- (55) Persons interested in the book’s history should *see* page one of the preface (AM)

- (56) *Véase* el capítulo siguiente
 see.IMP.REFL the chapter next
 ‘See the following chapter’ (LAR)

- (57) (Zuri) Gai hori gustatzen bazaizu, liburu hau
ikusi behar duzu
 you.DAT topic this like.HAB if.AUX book this
 see must AUX
 ‘If you like this topic, you should see this book’

Apart from the cross-linguistic extended meanings just revised, each language has developed further meanings. For instance, in English, it is possible to say (58) with the meaning ‘to escort’: where the person is accompanying Nellie to her house.

- (58) I’m *seeing* Nellie home (AM)

In (59), there is another possible meaning in English ‘to bring’, and ‘to last’⁵².

- (59) \$500 should *see* you to the end of the month (OSD)

In Basque, the verb *ikusi* ‘to see’ can have the meaning ‘to suffer’⁵³ as in (60).

⁵² In a way this meaning can be derived from the one before, as this can be interpreted as meaning the money should accompany this person for a month.

⁵³ This meaning is somehow similar to (53) discussed above. In this case, as in one of the interpretations in English, the subject is not only a witness of the suffering, but he experiences them in his own flesh. This is what I have previously called ‘active witness’.

- (60) (Hark) *Istilu gorriak ikusi zituen*
 he.ERG difficulty red.ABS.PL see AUX
 ‘He suffered a great deal’ (ELH)

It can be argued that the meaning ‘to suffer’ in (60) is carried out by the direct object *istilu gorriak*, not only in the word *istiluak* ‘difficulties’, but also in the word *gorri* ‘red’, which metaphorically means ‘terrible, awful, extreme’ in Basque⁵⁴. However, as seen in (61) it is possible to infer this meaning without having it implied in any other word in the sentence.

- (61) *Neureak ikusita nago*
 mine.ABS.PL see.PAR am
 ‘I’ve suffered a lot’ (AR)

Finally, in Spanish we have the meaning ‘to be involved’, and ‘to be related’ as in (62)⁵⁵.

- (62) *Y Schneider, ¿qué tenía que ver con la obra?*
 and scheider what had.3.SG COMP see with the play
 ‘And what did Scheider have to do with the play?’ (CORDE)

In this section I have analysed the related and non-related extended meanings of vision in English, Basque and Spanish. These are summarised in Table 2.4.

⁵⁴ See Perurena (1992) and Frank and Susperregi (1999) for more information about the Basque colour system.

⁵⁵ In Basque, it is also possible to have sentences like (1), but the meaning is more ‘to be related’ than ‘to be involved’ as in Spanish.

- (1) *Honek ez du horrekin zer ikusirik*
 this.ERG NEG AUX that.COM what see.PART
 ‘This has nothing to do with that’ (IS)

Meaning	English	Basque	Spanish	
Intellection group	‘to understand’	√	√	√
	‘to foresee’	√	√	√
	‘to imagine’, ‘to visualise’	√	√	√
	‘to consider’, ‘to regard’, ‘to judge’	√	√	√
	‘to revise’, ‘to study’	√	√	√
Social group	‘to meet’	√	√	√
	‘to visit’	√	√	√
	‘to receive’	√	√	√
	‘to go out with’	√	√	√
	‘to get on badly’	√	√	√
Assurance group	‘to ascertain’, ‘to find out’	√	√	√
	‘to make sure’	√	√	√
	‘to take care’	√	√	√
‘to witness’	√	√	√	
‘to refer to’	√	√	√	
‘to escort’	√			
‘to bring’, ‘to last’	√			
‘to suffer’		√		
‘to be involved’			√	

Table 2.4: Extended meanings in vision in English, Basque and Spanish.

2.3.2. HEARING

Hearing is said to be the sense of linguistic communication and in fact in all the meanings, both concrete and abstract, it seems to be so. There are always two elements involved in this sense: the hearer and the speaker. The latter could be a person or an object, known or unknown, but the fact is that it is always present.

The verbs analysed in this sense are *hear* and *listen* in English, *entzun* and *aditu* in Basque, and *oir* and *escuchar* in Spanish.

One of the extended meanings found cross-linguistically is ‘to heed, to pay attention’⁵⁶, as in (63), (64) and (65).

(63) *Listen* to what I’m telling you

(64) *Entzun* esaten ari natzaizuna

hear say.HAB be.busy AUX

‘Listen to what I’m telling you’

(65) *Escucha* lo que te estoy diciendo

listen.IMP it.ACC that you.DAT am saying

‘Listen to what I’m telling you’

In these three examples the person that utters the sentence is demanding attention from the hearer. A further development of this meaning is that in some contexts the speaker does not only demand attention, but also that the hearer does what he is telling him to do. In these cases hearing verbs come to mean ‘to obey’⁵⁷ as illustrated in (66), (67) and (68).

(66) I told you to *listen* to your mother

(67) *Seme* *batak* *ez* *eukan* *entzunik*

son one.ERG NEG had listen.PART

‘One of the sons was not obedient’ (AR)

(68) *Te* *he* *dicho* *que* *escuches* *a* *tu* *madre*

you.DAT have said COMP listen to your mother

‘I told you to listen to your mother’

The condition of hearing as an interpersonal relation is said to have caused the semantic shifts that the sense has undergone. In a way it makes sense and in the

⁵⁶ A development of this meaning is the special use of these verbs as ‘to attend a lecture, a sermon, a play, a musical performance...’ In these cases the hearer is a member of an audience. It is very interesting to see that in Basque the meaning ‘to hear mass’ is lexicalised with a vision verb *ikusi* ‘to see’ instead.

⁵⁷ In Chapter 3 the etymological relation between hearing and obey is discussed.

case of the shift, hear→heed→obey, it is true. The verbs of hearing in themselves do not mean ‘obey’⁵⁸ or ‘pay attention’. It is in the context of a conversation, hence interpersonal relation, that they acquire that meaning. Expressions like in Sp *Hacerse el sordo*, Bq *gor egin*, Fr *faire le sourd* ‘pretend not to hear’, or Eng *be deaf to a plea*, Sp *Hacer oídos sordos* clearly show this interpersonal quality of the sense of hearing and also its metaphorical connections.

Another extended meaning of these verbs is ‘to be told’, ‘to be informed’ as illustrated in (69), (70) and (71). This type of meaning has interesting implications for the study of evidentials. Evidentials are generally said to participate in the expression of the speaker’s attitude towards the situation his / her utterance describes. Sense perception verbs are a common cross-linguistic source for evidentials (see Willett 1988). Hearing verbs provide two kinds of evidence: ‘attached’, when the source of the speaker’s information is of a primary source; and ‘indirect reported’, when the source is of secondary origin, i.e. hearsay. This extended meaning will fit into the latter type⁵⁹.

(69) I *heard* that you are going to Scotland

(70) Eskoziara joango zarela *entzun* dut
 scotland.ALL go.FUT AUX.COMP hear AUX
 ‘I heard that you are going to Scotland’

(71) He *oido* que vas a Escocia
 have hear.PAR COMP go.2.SG to scotland
 ‘I heard that you are going to Scotland’

Finally, another extended meaning is ‘to understand’.

(72) If I have *heard* well, you want to say that there is no solution

⁵⁸ Except Dan *lystre* ‘obey’.

⁵⁹ For more information on evidentiality, see Chafe and Nichols (1986).

- (73) Ondo *entzun* badizut, zuk esan nahi duzu
 irtenbiderik ez dagoela.
 well hear if.AUX you.ERG say want AUX
 solution.PART NEG is.COMP
 ‘If I have heard well, you want to say that there is no solution’

- (74) Si le he *oído* bien, usted quiere
 decir que no hay solución
 if you.DAT have hear.PAR well you want
 say COMP NEG exists solution
 ‘If I have heard well, you want to say that there is no solution’

Apart from these cross-linguistic meanings, in Basque the hearing verb *aditu* can also be used for the identification of smells as in (75).

- (75) Kiratsa *aditzen* duzu
 stink.ABS hear.HAB AUX
 ‘You smell a bad odour’ (AR)

Another two extended meanings are possible in Basque if the hearing verb is nominalised. One meaning is ‘to be educated’ as in (76) and the other is ‘to have a pact or agreement’ as in (77).

- (76) (Bera) Izketan *aditua* da
 he.ABS talk.INE hear.ABS AUX
 ‘He is a learned speaker’ (AR)

- (77) Jende hauk badute oraino,..., *aditu* edo
 patu bat
 people these.ERG already.AUX now hear or
 pact one
 ‘These people already have an agreement’ (AR)

In this section, I have analysed the related and non-related extended meanings of hearing in English, Basque and Spanish. These are summarised in Table 2.5.

Meanings	English	Basque	Spanish
'to heed', 'to pay attention'	√	√	√
'to obey'	√	√	√
'to be told', 'to be informed'	√	√	√
'to understand'	√	√	√
'to be educated'		√	
'to have an agreement'		√	

Table 2.5: Extended meanings in hearing in English, Basque and Spanish.

2.3.3. TOUCH

The sense of touch has always been related to the field of emotions. Expressions such as *I'm deeply touched* or *touching words* are widely used in English. Already in 1921 Hans Kurath classified sense perception in respect to emotions and stated how “the kinaesthetic, the visceral, and the tactual perceptions have a relatively stronger tone than those of hearing and especially of sight, the taste-smell perceptions taking a middle ground” (p.39). Kurath explained this transfer of meaning from sense perception to emotion on the basis of the similarity of feeling that both domains share. This connection finds its explanation in the etymology as well. Buck (1949:1062) points out that the general word in West Germanic languages for ‘feel of’ and for ‘feel’ as in ‘perceive by touch’ refers not only to the physical perception but also to the emotions, even in the earliest periods of the language. However, if we review the different meanings that tactile verbs can convey, it is found that these verbs not only map onto the field of emotions but onto other semantic fields as well.

The verbs used in this case are *touch*⁶⁰ in English, *ukitu*⁶¹ in Basque, and *tocar* in Spanish.

⁶⁰ In English there are two verbal realisations of the sense of touch: *to touch* and *to feel*. Although the verb *to feel* is etymologically a tactile verb (see discussion in 3.3) and it can be used as a tactile activity and experience verb (see Section 2.2.1), it is also the verb of general physical

In the first instance there are two⁶² physical extended meanings found in the three languages. One meaning is ‘to partake of food or drink’ as in (78), (79) and (80).

(78) John hardly *touched* the food

(79) Jonek ez du ia janaria *ikutu*
 john.ERG NEG AUX hardly food.ABS touch
 ‘John hardly touched the food’

(80) Juan no ha *tocado* apenas la comida
 john NEG has touched hardly the food
 ‘John hardly touched the food’

In these three examples we learn that John did not eat much of his food, so in these cases, the meaning is ‘to partake of food’. If we change the direct object *food* for *drink*, then the meaning will be ‘to partake of drink’ instead. As argued in Chapter 7, in the development of polysemous senses of a word it is very important to understand that in some cases, the polysemy is due both to one of the words of the sentence, in this case the verb, and to the meaning of the other arguments that the verb takes.

It has been suggested (Barcelona p.c.) that instead of having the meaning ‘to partake of food or drink’, which is too specific, it would be better to propose a more general meaning like ‘to partake of something’. That would cover not only sentences like *John hardly touched the food*, but also examples like *I didn’t touch a penny from your money*. Although this proposal is sensible to some extent, I have decided to reject it and keep the former meaning for two reasons. First, because several

perception (cf. Lat *sentire* ‘to perceive by the senses’ and its Romance cognates). This ‘double’ function of the verb *to feel* creates a problem in the analysis of its extended meanings; namely, to decide which extended meanings are derived from which use (as a tactile verb or as a verb of general physical sensation). In order to void this problem I have decided to include in this analysis only the verb *to touch*, which is a more specific tactile verb.

⁶¹ *Ukitu* is the verb used in Standard Basque. In some of the examples discussed in this section, the verb *ikutu* is also used. This is a variant in the Guipuzcoan and Biscayan dialects.

⁶² Another extended physical meaning is ‘to be adjacent to’ as in *The two houses touch*, but as this is an extended percept meaning it will not be included here.

dictionaries I have consulted (cf. AMGD, AM, COL) contain this entry as a separate one. Second, because I do not think these two sentences imply exactly the same meaning. In my opinion, the inferences resulting from the two examples are different. A sentence like *John hardly touched the food* can only make reference to one action ‘to eat’ (or ‘to drink’ if we change the direct object for a drink), and the verb *to touch* can be replaced by the verb *to taste*. In the second sentence, the verb *to touch* is not related to the meaning ‘to eat’ (or ‘to drink’) and therefore, this substitution for *to taste* is not possible. Here the meaning refers more to the fact that I have not taken any money from that person, where ‘taken’ can be understood as the ‘physical action of grabbing sth.’, but also as ‘to steal’ it. Although not everybody would comply with my intuitions, I think it will be safer for the time being to keep the entry provided by the dictionaries rather than to propose a more general one.

Another physical meaning is ‘to affect’ as in (81), (82) and (83).

(81) Just don’t *touch* anything in my room (AM)

(82) Nork ukitu nau, nork ukitu ditu nire
soinekoak?

who.ERG touch AUX who.ERG touch AUX my
dress.ABS.PL

‘Who touched me, who touched my dresses?’ (IS)

(83) ¿ Quién ha *tocado* mis vestidos?

Who has touched my dresses

‘Who touched my dresses?’

These three examples imply that not only has physical contact occurred, but there has also been a change of state. In (81), the person who utters this sentence does not want the other person to change anything in his/her room, whereas in both (82) and (83), the person is asking about the person who did change the position of the dresses from the place they were before. This meaning, which I term ‘to affect’, has also a metaphorical extension as we shall see below.

As far as metaphorical meanings are concerned there are four meanings ‘to affect’, ‘to reach’ and ‘to deal with’.

We have already seen that ‘to affect’ can be understood physically as in (81), (82) and (83), but it also has a metaphorical interpretation as in the examples below.

(84) An appeal that *touches* us deeply (AM)

(85) Edertasunak *ukitu* du azkenean Iñakiren bihotz
gogorra

beauty.ERG touch AUX end.INE iñaki.GEN heart
strong.ABS

‘In the end, beauty changed Iñaki’s hard feelings’ (IS)

(86) Juan le *tocó* el corazón a María

john she.DAT touched the heart to mary

‘John touched Mary’s heart’ (CSE)

In these examples what is affected is the emotional side of the person in question. In (84) the appeal was very emotive to us; we could not remain with the same feelings or ideas that we had before hearing it. In (85) Iñaki’s feelings are changed too, as a result of the beauty that he saw in a person or thing. Finally in (86) John also affected, i.e. changed, Mary’s feelings⁶³. Although the emotional perspective of touch has been seen as an independent metaphorical mapping (Sweetser 1990: 37/43), I would like to include it as part of this wider meaning domain ‘to affect’. There are other examples in these languages where we have the same ‘contact-to-effect’ chain and that can also be included under this label. For instance, in Basque there is the expression *ardoa ukitu*, lit. ‘touch wine’, which means that the wine is spoilt and can no longer be drunk. In Spanish, when a person wins the lottery it is very common to say *Me tocó la lotería*, lit. ‘the lottery touched me’, in which case the lottery is the agent that provokes the change in me, that is to say I became rich.

⁶³ In this example, we have a further metaphor in the case of *heart*. According to Lakoff and Johnson’s (1980) theory, *heart* is not a physical object, but a metaphorical realisation of the image schema of a container, where HEART IS A CONTAINER FOR FEELINGS.

Following recent theoretical developments in the Cognitive Semantics framework (Radden, in press; Barcelona, in press b; among others), it could be argued that this metaphorical extension TOUCH → AFFECT (NON-PHYSICALLY) has a metonymic basis. This metaphor⁶⁴ could be based on the metonymic understanding of CAUSED PHYSICAL CHANGE (i.e. AFFECT) as touching, which is added to the metaphorical mapping ABSTRACT CHANGE IS AS PHYSICAL CHANGE. The possibility of explaining not only this semantic extension but also a few others in this chapter⁶⁵ by means of metonymy, is an interesting alternative that I will not be able to pursue in this thesis for two reasons. First, the fact that metonymy is not a clear-cut concept yet in Cognitive Semantics. Most cognitive linguists view metonymy as the mapping that takes place within the same conceptual domain, but there is still disagreement on its referential character and on the domains which could be the target of these metonymic mappings (see Barcelona, in press c). Second, the fact that many of these studies were not available in press at the time when I was developing this thesis. However, I would like to point out that the metonymic basis of perception metaphors, as well as the relationship between metonymy as a cognitive device and the theoretical hypothesis put forward in the following chapters, are areas that I would like to investigate in future research.

Another meaning is ‘to reach’ as in (87), (88) and (89) below.

(87) He *touched* the high point in his career. (COL)

(88) 1685etik aurrera agintearen gailurra *ukitu* zuena
 1685.ABL forward mandate.GEN top.ABS touch AUX.who
 ‘He who reached the top of his mandate from 1685 onwards’ (IS)

⁶⁴ This kind of metaphor is what Radden (in press) calls a ‘metonymy-based metaphor’, i.e. “a mapping involving two conceptual domains which are grounded in, or can be traced back to, one conceptual domain”.

⁶⁵ For instance, the semantic extension VISION → SOCIAL RELATIONSHIP could be explained by the metonymy EFFECT (see) FOR CAUSE (visit, meet, receive...); or for the case of HEAR → OBEY the metonymic basis could be PRECONDITION (hearing) FOR RESULT (obeying). I would like to express my gratitude to Antonio Barcelona for introducing me to this model and for suggesting all these possible metonymies.

- (89) Ha *tocado* el punto más alto de su carrera
 has touched the point most high of his career
 ‘He has reaches the peak of his career’ (OSD)

These three examples imply that there is a point, an aim to be reached or that the moment to do something or end-point has arrived. In (87), (88) and (89), this end-point is the success⁶⁶ achieved in a career. In other cases, as in (90), the end-point is spatial.

- (90) The ship *touches* at Tenerife (COL)

In (90) the ship has arrived at her destination, at the dock. In English the fact that the ship is going to stay in the dock for a brief period of time is also implied. However this is not the case in Spanish.

- (91) El barco *tocó* puerto ayer
 the ship touched port yesterday
 ‘The ship arrived yesterday’

In (91), the information we are given is simply that the ship arrived, but not about the length of time it will stay.

In Spanish there is further usage of this meaning ‘to reach’. What (92) implies is that the time to pay has come. This usage is very interesting because it is etymologically related to the onomatopoeic origin of the verb *tocar*, as we shall see in Chapter 3. In old times the tolling of the bells used to announce events in villages. Still in current times one can hear the church bells calling people to prayer. In Spanish this is referred to as *tocar a misa*, lit. ‘touch to mass’. In this example the end point is temporal.

- (92) *Tocan* a pagar
 touch.3.PL to pay
 ‘It is time to pay’ (RAE)

⁶⁶ This positive interpretation is explained in Lakoff and Johnson (1980). (87) and (88) are examples of what they call ‘orientational’ metaphors: “metaphorical concept that organises a whole system of concepts with respect to one another” (1980:15). UP is always related to good, high status and it is opposed to DOWN, which implies bad, low status; as in the expression *to touch bottom*.

These meanings are very iconic and could be represented in a diagram as shown in Figure 2.1:

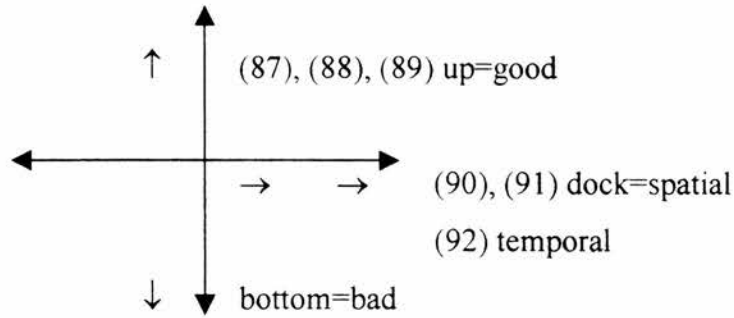


Figure 2.1: Representation of the meaning ‘to reach’.

Another metaphorical meaning in the sense of touch is ‘to deal with’ as in (93), (94) and (95).

(93) I wouldn’t *touch* that business (AM)

(94) Nik ez nuke gai hori *ikutuko*
 I.ERG NEG AUX topic that touch.FUT
 ‘I wouldn’t touch that topic’

(95) Yo no *tocaría* ese tema
 I NEG touched.IRR that topic
 ‘I wouldn’t touch that topic’

The examples above can be paraphrased as ‘I wouldn’t get involved in that business / topic’. This meaning can be modified by the inclusion of an adverbial expression as *many times, for a long time*, in which case the meaning would be ‘to know by experience’ as in (96) and (97) below. It could also mean ‘to deal with superficially’, if a word like *barely* or the preposition *on* in English is inserted as in (98)⁶⁷.

⁶⁷ In Chapter 7 I will discuss how the inclusion or exclusion of a lexical item affects the meaning of the sentence in which it occurs in much greater detail.

- (96) (Nik) Unibertsitate-gaia luzaz ukitu dut
 I.ERG university-topic.ABS long touch AUX
 ‘I have dealt with university matters for a long time’ (IS)
- (97) Ya he tocado ese tema varias veces
 already have touched that topic several times
 ‘I have already touched that topic several times’
- (98) He barely *touch*ed on the incident in his speech (AMGD)

The meanings analysed above are those that occur cross-linguistically in Basque, English and Spanish. However, there are other meanings that are only specific to each of these languages. For example, in English we have (99), which means ‘to ask for a loan’.

- (99) *Touch* a friend for five dollars (AM)

In Basque using the verb *haztatu*⁶⁸ ‘to touch’, it is possible to infer the meaning ‘to consider, to weigh up’ as in (100).

- (100) (Guk) *Hazta* ditzagun arrazoiak
 gu.ERG touch AUX reason.ABS.PL
 ‘Let’s consider the reasons’ (ELH)

Finally, in Spanish we have the meanings ‘to correspond’⁶⁹ as in (101), ‘to be a relative’ as in (102), and using the verb *tentar* the meaning ‘to persuade, to stimulate, to inspire’⁷⁰ as in (103).

⁶⁸ *Haztatu* is more common in the northern dialects (see etymology Chapter 3).

⁶⁹ In Basque I found one example (2) with this meaning as well. However, this meaning is usually expressed with the verb *egon* ‘to be (stative)’ in the dative as in (3):

- (2) Jangoikoari ukitzen zaizkion gauzak
 god.DAT touch.HAB AUX thing.ABS.PL
 ‘The things that correspond to God’ (IS)
- (3) Zuri dagokizu egitea
 you.DAT is.DAT make.ABS
 ‘It is your turn to do it’

⁷⁰ This meaning is also possible with *tocar* as in (4):

- (4) Le tocó Dios en el corazón
 him.DAT touched god in the heart
 ‘God inspired his heart’ (RAE)

2.3.4. SMELL

The sense of smell is generally considered a weaker source domain for metaphorical meanings in comparison with the other senses (Caplan 1973; Viberg 1984; Sweetser 1990). Although the sense of smell in human beings is not as developed as other senses such as vision, Ibarretxe-Antuñano (1997, 1999a, 1999b) has shown that this sense does have several extended meanings. In this section these meanings are analysed. The verbs⁷¹ used in this analysis are *smell* and *sniff* in English, *usaindu*, *usnatu*⁷² and *usmatu* in Basque, and *oler*, *olfatear* and *husmear* in Spanish.

In the first instance there is one physical extended meaning in the three languages, i.e. ‘to trail something’, illustrated in (104), (105) and (106).

(104) The dog was *sniffing* the ground looking for the hare

(105)	Txakurra	<i>usnaka</i>	zebilen	erbiaren	bila
	dog.ABS	smelling	was	hare.GEN	search.ABS
	‘The dog was sniffing around looking for the hare’				

(106)	El	perro	estaba	<i>olfateando</i>	el	suelo	en
	busca	de	la	liebre			
	the	dog	was	smelling	the	ground	in
	search	of	the	hare			
	‘The dog was sniffing the ground looking for the hare’						

In these examples the meaning of the verb of smell is still physical: the dog was actually physically smelling the ground and following the trail (i.e. smell) left by the hare.

⁷¹ In this study I only focus on verbs denoting neutral perception. Consequently verbs like Eng *stink* and *stench* (as well as their equivalent words in the other languages, Bq *ufaztu*, *kiraztu*; Sp *apestar*, † *heder*) are not included, despite the fact that in earlier stages of the language, they were used for indicating neutral smell (see for instance OE *stinc*).

⁷² This verb is more widely used in the Northern dialects.

Apart from this physical meaning, smell verbs can have additional metaphorical senses. For instance *smell* can also mean ‘to suspect’ as in (107) and ‘to guess, to sense something intuitively’ as in (108):

(107) Things... wouldn’t always get past the sharp-eyed QC. If a case smelt, he would *smell* it (OED-1973)

(108) Mary can *smell* trouble a mile off (OSD)

In (103) *smell* is used in two different ways. The meaning of the former is used as the indication of bad characteristics. It can be easily replaced by the verb *stink*. The second *smell* is the one that interests us because it means ‘to suspect’. (107) could be paraphrased as ‘if there was something wrong in the case, the QC would suspect it’. It has been suggested that the second *smell* could be paraphrased as ‘to know’ instead of ‘to suspect’. Although it is true that there is a great deal of variability in the interpretation of this example, it is important to take into account that the information that we get when we use our sense of smell is not as reliable as that we have if we use another sense, such as vision. In (107) the QC did not know for sure that there was something wrong with the case and that is why the verb *smell* is used instead of *see*, in which case the sentence would not offer any doubt in respect of its meaning.

The meaning of (108) is rather different from (107). What it says is not that Mary suspects that there is going to be trouble, but that in case there was, she would sense it, she would guess it beforehand. Although sometimes *guess* and *suspect* can be taken as synonyms, in these two examples they appear to be different. *Suspect* always carries a negative meaning. If we suspect something or somebody, there are always negative connotations implied. This is not the case with *guess*. What is guessed might be a negative or a positive thing. Its quality is not implied by the verb itself but by the fact that is foreseen.

Both meanings are not restricted to English. They are also possible in Basque. In (109) *smell* has the meaning ‘to suspect’:

- (109) Sailburuaren kontuak zuzenak ez zirela
erraz *usain* zitekeen
minister.GEN account.ABS.PL right.ABS.PL NEG were.COMP
easily smell could
'It was easy to suspect that the minister's accounts were not clear'

As in (107), in this example the verb of smell comes to mean 'to suspect'. We suspected that the minister's accounts were not clear, that there was something wrong with them. This verb is always connected to negative connotations.

And (110) smell has the meaning 'to guess'.

- (110) Kanturako haren zera ikusiz, (nik) mutrikuarra
zela *usaindu* nuen
song.ALL.ADN he.GEN way.ABS seeing I.ERG mutriku.GEN
was.COMP smell AUX
'From his way of singing, I guessed he was from Mutriku' (HM)

(110) might be a more illustrative example than (108) above. In (110) there are no negative connotations or bad characteristics to be discovered, but only the fact that this person was from a town called Mutriku. In his particular way of singing there were some hints that make us guess where he came from.

Finally, these same meanings are found in Spanish, 'to suspect' in (111) and 'to guess' in (112):

- (111) Me *huelo* que ella está detrás de todo esto
I.REFL smell that she is behind of all this
'I suspect she is behind all this' (OSD)

As in the previous examples in English (107) and Basque (109), there are negative connotations implied in (111). These negative characteristics are not present in (112) below:

- (112) Juan ya se ha *olido* la broma
john already he.REFL has smelt the joke
'(I think) John might have guessed that it's a joke' (RCD)

‘To guess’ and ‘to suspect’ are not the only two possible metaphorical extensions in the domain of smell. Smell verbs can also mean ‘to investigate’ as in (113), (114) and (115).

(113) The police have been *sniffing* around here again (RCD)

(114) Bere gauzetan usnaka ibili ondoren, bera
 hiltzailea izan zitekeela usaindu nuen
 he.GEN things.INE smelling be after he.ABS
 murderer.ABS be could.COMP smell AUX
 ‘After I sniffed around, I suspected he could be the murderer’

(115) Le han ordenado que *husmee* las
 cuentas
 he.DAT have.3.PL ordered that sniff.3.SUBJ the
 accounts
 ‘They have ordered him to investigate the office accounts’ (HM)

In these examples, the police are not using their noses to physically smell. Although the same kind of action as in (104), (105) and (106) above is implied in these latter examples it should be understood in a metaphorical rather than a physical way.

Apart from these cross-linguistic extended meanings, English and Basque have developed other meanings unique to these languages.

In English the verb *sniff* also means ‘to disdain’, ‘to show contempt’ as in example (116) below.

(116) The critics *sniffed* at the adaptation of the novel to film (AM)

Basque has three more meanings, ‘to corrupt’, ‘to prophesy’ and ‘to go unnoticed’. As briefly mentioned before, smell verbs are used in Basque to indicate that the wine is rancid, or that the milk is gone off as in (117). As a metaphorical extension of this meaning it is also possible to use these verbs to mean ‘to corrupt’ as in (118).

- (117) Esnea *usaindu* da
 milk.ABS smell AUX
 ‘The milk has gone off’ (HM)

- (118) Hangoen pentsamoldeak bizimoduz *usaindu* zuen
 there.ADN.GEN ideology.ERG life.INSTR smell AUX
 ‘The neighbours’ way of thinking corrupted their way of living’ (HM)

Another meaning that is possible in Basque is ‘to go unnoticed’, as illustrated in (119). In this sentence the meaning of the smell verb implies that this organisation, AEK in the province of Biscay, has not received any funding at all. It is important to point out that the meaning ‘to go unnoticed’ does not imply that the subject, AEK in Biscay, did not want the funding, but that that they did not even have the chance to participate or to partake of it and as a consequence they were left out.

- (119) Gipuzkoa eta Arabako AEK urte erdiko
 subentzioa jaso ezinean, eta Bizkaikoa urte
 osokoa *usaindu* ere gabe
 guipuzcoa and alava.ADN AEK year half.ADN
 funding.ABS receive impossibility.INE and biscay.ADN.ABS year
 whole.ADN.ABS smell also without
 ‘AEK in Guipuzcoa and Alava could not receive half a year’s
 funding, but the one in Biscay did not get the whole year’s funding at
 all’ (EEBS)

Finally, the meaning ‘to prophesy’ is also found in Basque smell verbs as in (120).

- (120) [...] alaba onek [...] etorkizun illunpeak urratu eta
 erdi-ikusi edo *usnatu* zuela, esan genezake
 daughter this.ERG future obscurity.ABS.PL break and
 half-see or smell aux.COMP say could.I.PL
 ‘We could say that this daughter could explore and foresee⁷³ the
 hidden future’ (EEBS)

In this section I have analysed the related and non-related extended meanings of the sense of smell in English, Basque and Spanish. These are summarised in Table 2.7.

Meanings	English	Basque	Spanish
‘to trail something’	√	√	√
‘to suspect’	√	√	√
‘to guess’, ‘to sense’	√	√	√
‘to investigate’	√	√	√
‘to disdain’, ‘to show contempt’	√		
‘to corrupt’		√	
‘to prophesy’		√	
‘to go unnoticed’		√	

Table 2.7: Extended meanings in smell in English, Basque and Spanish

2.3.5. TASTE

The physical sense of taste is generally linked to personal likes and dislikes in the mental world. Perhaps the reason why this is so lies in the fact that the sense of taste is most closely associated with fine discrimination. According to Buck (1949:1031), among Hindus there are six principal varieties of taste with sixty-three possible mixtures and among Greeks six, including the four fundamental ones: ‘sweet’, ‘bitter’, ‘acid’ and ‘salt’.

⁷³ Lit. she ‘smelled, half-saw and broke into’.

This makes the sense of taste very accurate from a descriptive point of view as it allows us to express ourselves very precisely when we want to describe a taste. Although this relation between taste and likes / dislikes is very common cross-linguistically, this meaning seems to be encoded only by taste nouns in Basque, English and Spanish. It is for this reason that apart from the analysis of taste verbs, I devote a small subsection to the analysis of the meanings in taste nouns here as well.

The verbs used in this sense are *taste* and *savour* in English, *dastatu* in Basque, and *gustar*, *saber* and *saborear* in Spanish. The nouns used are *taste* in English, *zapore* and *gustu* in Basque⁷⁴ and, *sabor* and *gusto* in Spanish.

One of the extended meanings that taste verbs have cross-linguistically is ‘to experience something’ as in (121), (122) and (123).

(121) He has *tasted* the frustration of defeat (AMGD)

(122) (Hark) Ilabete bat eta erdiz presondegia *jastatu*⁷⁵
zuen

he.ERG month one and half.INSTR jail.ABS taste
AUX

‘He tasted the life in prison for a month and a half’ (LM)

(123) (Ellos) *gustaron* las mieles del triunfo

they tasted the honeys of-the victory

‘They tasted the sweet taste of victory’ (OSD)

Although in the English translation of (123) it could be argued that this sentence could also mean ‘enjoy’, in the Spanish example this interpretation is not possible. As we shall see in the examples of the following meaning, the verb *gustar* in sentences like (131) below does mean ‘enjoy, like’, but in (123), it means experience something, in this case a victory. The verb *gustaron* can be substituted by

⁷⁴ As discussed in the chapter devoted to the etymology (Chapter 3), unlike in the other senses, Basque does not seem to have a taste system of its own. Taste words are borrowed from Latin (verbs) and Spanish (nouns).

⁷⁵ *Jastatu* is a dialectal variation of *dastatu*.

the verb *probaron* (*probar*⁷⁶ ‘taste, try’), which does not imply enjoyment as in (124) below.

- (124) (Ellos) *Probaron* las mieles del triunfo
 they tried the honeys of-the victory
 ‘They tasted the sweet taste of victory’

The other extended metaphorical meaning in taste verbs is ‘to enjoy’.

- (125) I *savour* the sweet taste of revenge

According to the OED, *taste* used to mean ‘enjoy, take pleasure’ as in (126).

This use, however, is archaic nowadays.

- (126) If I wondered at Johnson not *tasting* the works of Mason and Gray,
 still more have I wondered at their not *tasting* his works (OED-1791)

- (127) (Hark) Munduko plazerrak dastatu zituen
 he.ERG world.ADN pleasure.ABS.PL taste AUX
 ‘He tasted the pleasures of this world’ (ELH)

- (128) Garaipena dastatzen hasiak zirelarik, (haiek)
 partidua eten egin zuten.
 victory.ABS taste.HAB beginning.ABS.PL AUX-when (they.ERG)
 match.ABS break make AUX
 ‘When they started to savour the taste of victory, they cancelled the match’ (ELH)

These two examples of taste mean ‘enjoy’, however, they are not the same. In (127) the connection with the actual physical sense of taste is more dominant. The meaning of ‘enjoy’ is made implicit by the word *plazerrak* ‘pleasure (pl.)’, but without it (127) might have meant ‘experience’ or ‘try’. On the other hand (128) is not so close to the physical meaning. It is true that a victory is something positive, especially if you are the person that is winning, however, if we change the sentence

⁷⁶ As discussed in Section 2.2, Spanish does not have an activity taste verb. In this case the verb *probar* (lat. *prōbare* ‘try, experiment’) is used instead.

to something similar like (129), the meaning changes from taking pleasure in winning to taking pleasure in the defeat of the opposing side.

(129) They started to *taste* the other team's defeat

To lose a game cannot be considered as something positive and therefore the object itself does not imply this positiveness as in (127), but it does imply enjoyment on the part of the subject. However in (130) the object overrides the positive implicature.

(130) The Romans *tasted* defeat at the hands of a Barbarian army

(131) Le *gusta* jugar al fútbol
 he.DAT likes play to-the football
 'He likes playing football'

Although the meaning 'to enjoy' exists in Spanish as in (131), the opposite feeling is also possible:

(132) Me *supo* mal el decírsele
 I.DAT tasted badly the tell-him-it.ACC
 'I didn't like to tell him so'

This sentence can be also said with *gustar* as in (133).

(133) No me *gustó* el decírsele
 NEG I.DAT liked the tell-him-it.ACC
 'I didn't like to tell him'

In these examples, the feeling that is produced is not good or enjoyable, but just the opposite. Instead of having two differentiated meanings, 'to enjoy' and 'to dislike', 'to produce a feeling' could be considered the superordinate and 'to enjoy' the hyponym.

It is also worth noting that in these two examples, when the feeling produced is that of a negative quality, the use of a negative⁷⁷ form is required. This seems to indicate that these verbs, when used without any qualifying adjectives or adverbs, imply a positive meaning⁷⁸. This is also the case in the nouns derived from these verbs.

Apart from these cross-linguistic meanings, the sense of taste in Spanish has more meanings. This sense is quite unique in Spanish. While in other Romance languages the cognates of the Spanish verb *saber* have kept only one of two meanings from the Latin *sapere* ‘to taste’, ‘to know’⁷⁹, in Spanish both meanings are still in use. The physical percept meaning discussed in Section 2.2 and the meaning ‘to know’⁸⁰ as in (134).

- (134) María *sabe* la lección
 mary knows the lesson
 ‘Mary knows the lesson’

In this section I have analysed the related and non-related extended meanings of the sense of taste in English, Basque and Spanish. These are summarised in Table 2.8.

Meanings	English	Basque	Spanish
‘to experience something’	√	√	√
‘to produce a feeling’	√	√	√
‘to know’			√

Table 2.8: Extended meanings in taste in English, Basque and Spanish.

⁷⁷ This is also possible in Basque. For example,

(5) Joni futbola ez zaio gustatzen
 john.DAT football.ABS NEG AUX like.HAB
 ‘John doesn’t like football’

⁷⁸ The role played by the different arguments that verbs take in the overall meaning of the sentence is discussed in Chapter 7.

⁷⁹ The etymology and development of this verb is explained in Chapter 3.

⁸⁰ The kind of knowledge expressed in the verb *saber* is the same as that encoded in G *wissen* or Fr *savoir*.

2.3.5.1 The nouns of the sense of taste.

In this section I review only those meanings conveyed by taste nouns that are not present in taste verbs in the three languages of the sample. The taste nouns analysed are *taste* in English, *sabor* and *gusto* in Spanish, and *zapore* and *gustu* in Basque⁸¹. These meanings are represented in Table 2.9.

Meanings	<i>taste</i>	<i>sabor</i>	<i>gusto</i>	<i>zapore</i>	<i>gustu</i>
'Liking, preference'	√		√		√
'Ability to perceive and enjoy what is beautiful and harmonious'	√		√		√
'Judgements of aesthetic, intellectual artistic or social matters (standards)'	√		√		
'Discretion, delicacy'	√		√		

Table 2.9: The nouns of the sense of taste in English, Spanish and Basque.

As seen in Table 2.9, the Sp taste noun *sabor* and the Bq *zapore* are not very productive in terms of metaphorical extended meanings if compared with the other two taste nouns, Sp *gusto* and Bq *gustu*. The etymological origin and semantic development of these words in Spanish may explain why this is so. Sp *sabor* is related to the verb *saber*. This verb has two meanings 'to have a taste (percept)' and 'to know' (see Section 2.2.2). Sp *gustu* is related to the verb *gustar*, which nowadays means 'to like', but as explained in Chapter 3, it used to function as a taste activity verb in Middle Spanish. Therefore, it seems that only those nouns deriving from activity verbs have developed these metaphorical meanings summarised in Table 2.9.

The relation between the sense of taste and personal likes and dislikes is only present in the nouns, as in examples (135) and (136).

(135) She has a *taste* for foreign travel (OAL)

This sentence means that she likes travelling in foreign countries. She prefers that kind of travelling.

⁸¹ These two nouns are loanwords from Spanish (Bq *dastatu* 'to taste', also from Latin – see Chapter 3).

(136) Modern art is not to everyone's *taste* (OAL)

This means that not everybody likes modern art.

However, some other meanings are possible too. In (137) and (138) it is not only that we like or dislike the fact that Peter has money or Mary's clothes but also that we make judgements according to our standards or to the social or aesthetic standards of the time we live in.

(137) Peter's got more money than *taste*

(138) Mary has no *taste* for clothes

Finally, another meaning is possible, that of delicacy and discretion.

(139) That remark lacks *taste* (COL)

In this sentence, we are implying that that remark is rude, not appropriate for that moment. Again, in this sentence we are making judgements according to our standards.

It is worth noticing the fact that when the word *taste*, as well as its equivalents in the other languages of the sample, is not accompanied by any gradual modifier or qualifying adjective it always refers to positive characteristics. Therefore, if we say

(140) Pedro tiene *gusto* para la ropa
 peter has taste for the clothes
 'Peter has taste for clothes'

what we mean is that the clothes he chooses are nice, that he combines the colours very well and so on.

In conclusion it can be said that the nouns of the sense of smell present two cognitive meanings: on the one hand, likes and dislikes, and on the other judgements based on social, aesthetic, intellectual and artistic standards.

2.3.6. SUMMARY

In this section the main cross-linguistic extended meanings of the five sense perception modalities have been analysed. Meanings particular to Basque, English

and Spanish have been also briefly discussed. In the sense of vision four groups of extended meanings have been presented: intellection group, with meanings such as ‘to understand’, ‘to foresee’, ‘to imagine’ and ‘to judge’; social group including ‘to meet’, ‘to visit’ among others; reliability group with ‘to find out, to ascertain’, ‘to make sure’ and ‘to take care’, and finally other meanings such as ‘to witness’ and ‘to refer’. ‘To heed, to pay attention’, ‘to obey’, ‘to be informed’ and ‘to understand’ are the extended meanings discussed in the sense of hearing. In the sense of touch four meanings are presented, ‘to partake of food’, ‘to affect’, ‘to reach’ and ‘to deal with’. ‘To trail something’, ‘to guess’, ‘to suspect’ and ‘to investigate’ are the meanings included in the sense of smell. Finally, in the sense of taste we have the meanings ‘to experience something’ and ‘to produce a feeling’ in the verbs, together with the meanings ‘likes, dislikes’, ‘judgements of aesthetic, intellectual, artistic or social matters’ and ‘delicacy’ found in the taste nouns.

The high number of extended meanings in the sense perception verbs indicates that this semantic field is highly polysemous. The fact that many of these meanings are found in three different unrelated languages, Basque, English and Spanish, points out that these extensions of meaning are not language particular, but a cross-linguistic phenomenon, although not all languages share precisely the same meaning transfers.

2.4. CONCLUSIONS

In this Chapter I have analysed the semantic field of sense perception from a cross-linguistic point of view using Basque, English and Spanish as the main reference languages.

In Section 2.2 the physical meanings of this semantic field are discussed. Following Viberg’s (1984) and Gisborne’s (1996) classification of perception verbs on the basis of the semantic role of their subjects, perception verbs are divided into three types: experience, activity and percept. These physical meanings are regarded as prototypical because they are the central meanings that these verbs convey. In Section 2.3 non-prototypical or extended meanings of the sense perception verbs are analysed. These meanings are only those resulting from activity and experience verbs alone. The great number of meanings discussed in this analysis shows that this

semantic field is highly polysemous and that most of these meanings are not particular to one language, but shared by at least the three languages used in this research.

In this chapter I have analysed the different meanings of perception verbs. I have presented ‘raw’ data from the languages analysed. The aim of the rest of this thesis is to try to make sense of the reasons why and how these meanings are conveyed by this particular group of verbs and no other.

In the following chapter the etymology of the verbs used in the analysis will be discussed. The objective of this chapter is to provide further support for the claim that meanings evolve from a physical domain to a more abstract domain. It is also the aim of this chapter to show how words that are not etymologically related convey the same meanings.

CHAPTER 3: THE ETYMOLOGY OF PERCEPTION VERBS.

In the previous chapter I have given a synchronic analysis of the semantic field of perception verbs in English, Basque and Spanish. This analysis offers us a picture of what meanings are conveyed by these perception verbs in present-day English, Basque and Spanish. However, perception verbs have not always contained the same meanings in the past. Semantic change occurs as a step by step process over time, such that at any given period a word may have several meanings and over time some of these meanings will remain, while others will change or disappear. Thus, the study of polysemy in perception verbs presented in the previous chapter can be considered as only one stage in the semantic development of these verbs.

In order to understand why perception verbs have their present-day meanings it is necessary to examine how their meanings have developed and what the sources of perception verbs in these three languages are. Etymological information is very useful because as Sweetser puts it, “through a historical analysis of ‘routes’ of semantic change, it is possible to elucidate synchronic semantic connections between lexical domains; similarly, synchronic connections may help to clarify reasons for shifts of meaning in past linguistic history” (1990: 45). In this chapter, an etymological study of perception verbs is presented both as background information for some of the claims made in this thesis and as a basis for future research into semantic change in this field.

The study of semantic change underwent a long period of relative neglect. It was generally regarded as whimsical, random and irregular, mainly because it did not offer as many tractable data to systematic analysis as other fields in Linguistics, such as Phonology and Syntax. The creation of general rules that could explain how and why these changes took place was thought to be impossible (Hock 1986: 308). As a consequence, most of the studies in this area focused on individual changes rather than on the search for regular semantic changes, which could provide some

generalisations and constraints⁸². It was not until the last twenty years that Ullmann's statement that in semantic change "the existence of [...] regularities is in most cases extremely hard to demonstrate, and their very possibility is still doubted by many scholars" (1957: 154) was questioned and disputed.

Researchers within the framework of Cognitive Linguistics, such as Sweetser (1990)(see Chapter 4), have challenged this view. They have shown that there are certain types of semantic change that are regular and recurrent enough to be predictable. It is important to remember that, as pointed out in Section 1.1.1, the traditional Saussurian dichotomy between synchrony and diachrony is not strict within this framework. Meanings are cognitive structures embedded in our patterns of knowledge and belief, and therefore it can be said that the same social, functional and cognitive motivation present in historical changes is also observable in ongoing changes. In other words, if we can provide a model that accounts for how and why polysemy occurs in a semantic field in present-day language, it will be possible to apply the same constraints and parameters to the study of how and why semantic evolution occurs in the same semantic field.

Unfortunately a thorough analysis of the semantic changes in perception verbs is beyond the scope of this thesis. Here I base my analysis on present-day meanings of these verbs. Stemming from these data I propose a model that accounts for the reasons why, as well as for the ways in which, these meanings are conveyed by this semantic field in particular (see Chapters 5, 6, 7). Whether the framework put forward in this thesis can be applied, as predicted, to the study of semantic development remains a question for future research. The etymology of perception verbs⁸³ presented in this chapter will help to stimulate such a research by providing a useful basis that may have predictive applications.

The etymological descriptions that follow will be used as further support for some of the claims put forward in this thesis. These descriptions support the cross-

⁸² Traditional accounts for semantic change can be found in Antilla (1972), Bloomfield (1935, 1983[1914]), Hock (1986), Jeffers and Lehiste (1979), Ullmann (1957, 1962), among others. McMahon (1994) is a good survey of both traditional and more recent approaches in semantic change.

⁸³ Most of the information gathered in this chapter is drawn from etymological dictionaries (see special section in Bibliography), as well as specialised books on the subject. As it is not my aim to propose new etymologies or to disclaim any of those already in existence, I have limited myself to report what my sources have said about the etymological origins of these verbs.

linguistic character of the semantic extensions presented in Chapter 2. The languages used in this analysis belong to different language families. English and Spanish are both Indo-European, but the former is a Germanic language, whereas the latter is a Romance language. Basque is not etymologically related to either. It is an isolated language. The fact that the perception verbs in these languages are not etymologically related, but at the same time show the same polysemous senses, gives further evidence for the cognitive linguistic tenet that these semantic extensions are motivated by our bodily, physical, social and cultural experiences. The bodily basis of the semantic extensions in perception verbs is presented in Chapter 5 and Chapter 6 shows how it may constrain the creation of such extended meanings.

It is to the description of the etymology of these perception verbs that we now turn.

3.1. VISION

There are four possible roots that words related to the sense of sight may have in Indo-European (IE) languages. Sight seems to be etymologically linked with words related to ‘light’, ‘eye’ and ‘knowledge’. According to Buck (1949) the following are the IE roots:

IE **weid-*: in words related to ‘to see’ in Greek, Latin (*videre* ‘see’) and Balto-Slavic languages and in words related to ‘to know’ in Greek, Celtic, Germanic and Indo-Iranian. It is not clear which of these meanings is the first one. On the one hand, ‘to know’ can be considered as a secondary development starting in the perfective: ‘have seen’ > ‘know’. On the other hand, the view that both ‘to see’ and ‘to know’ come from a common ‘recognise’ is also held.

IE **derk-* as in Welsh *drych* ‘sight, appearance’.

IE **spek-* as in Latin *aspicere* ‘to look’.

IE **ok^w*- in most of the words for ‘eye’, cf. Lat *oculus*, Sp *ojo*, It *occhio*.

IE **leuk-* in words for ‘light, bright’, cf. Lat *lux* ‘light’, Gk *leukos* ‘white’.

In general, some of the words meaning ‘to see’ (experience) can also be used in the sense of ‘to look’ (activity). The case of Greek *blepo* ‘see’ is interesting in that the meaning seems to have shifted in the opposite direction: ‘look’ > ‘see’.

Some words related to ‘to look’ are also connected to the notion of ‘to watch’, ‘to guard’, for example Greek *horao* ‘see’.

Therefore, sight is related etymologically with knowledge, light, and guarding. What makes these etymological links interesting is not only their role among IE languages, but the fact that in other languages, which are non-IE and whose words for sight are not related to these roots described above, the words for sight also develop the same meanings. As discussed in Section 2.3.1, the Basque verb *ikusi*, which is not related to any of these IE roots, can also mean ‘to understand’. Thus it seems that the connection between the domain of vision and that of knowledge is very deep and that it goes beyond etymological roots.

The English verb *see* comes from ME *seen* < OE *seon*, cognate of OHG *sehan* (G *sehen*) and Mdu *sîen* (Du *zien*). All these forms come from Oteut **seh^w* < PreTeut **seq^u*. The English verb *look* comes from OE *locian*, which is an OTeut verb type **lôkôjan* ‘to see’, ‘to look’.

There are two main vision verbs in Basque: *ikusi* and *begiratu*. Both are found in the first written text in Basque in 1545 (Etxepare). *Ikusi* seems to be a very old verb in Basque. The proto-form could have been **ekusi*, which changed into *ikusi*, as a result of vowel assimilation⁸⁴. Although currently the synthetic forms of this verb are no longer widely used, they were very frequent in the 16th century, for example, *nik da-kus-at* (I.ERG see) ‘I see’⁸⁵. The etymological origin of *begiratu* < **bigiratu* has been widely discussed in the literature. On one hand, it can be regarded as having derived from the word *begi* ‘eye’ + *-ra* ‘allative case’ + *-tu* ‘verbal ending’, but many scholars seem to agree on its Latin origin from the verb *vigiliare* or the noun *vigilia*. According to Michelena (1964:102), the influence of *begi* ‘eye’ has been secondary and a product of folk etymology. The evidence to support the Latin origin comes from the fact that *begiratu* means ‘to look at’, ‘to watch’ in the West, whereas in the east⁸⁶ it means ‘to keep’, ‘to preserve’, which is a meaning closer to

⁸⁴ Michelena (1988), Hualde *et al.* (1995), and Trask (1997) are good surveys of the state of art in Basque historical linguistics.

⁸⁵ The verb *entzun* ‘to hear’ also has these synthetic forms, as for example *nik da-nzu-t* (I.ERG hear) ‘I hear’. Both verbs *entzun* and *ikusi* are regarded as words of Basque origin and the fact that they have these synthetic forms supports this claim (See Gomez and Sainz (1995)).

⁸⁶ East dialects such as Labourdian and Zuberoan are more conservative than those in the West; therefore the meaning ‘to keep’, ‘to preserve’ should be considered older.

its Latin cognate. Another common verb of sight in Basque is *behatu* (1545). This verb seems to be used in the place of *begiratu* in the eastern varieties (Etxepare, 1545⁸⁷), with the meaning of ‘to look at’. Michelena ([1985] 1990: 221) relates this verb with the word *belarri* ‘ear’, which in the eastern dialects is *beharri*. If this origin is true it would be an interesting point as it would be a counter-example of Viberg’s (1984) hierarchy of sense perception, because it reverses the order proposed by him, from hearing to vision instead of from vision to hearing (see Section 2.2 above).

The Spanish verb *ver* comes from Lat *videre*. *Ver* is a common verb used in all dialects and it has been in use since the first written texts in the same form, apart from an early *veder* in Berceo (13th century)⁸⁸.

The Spanish verb *mirar* comes from Lat *mirari* ‘to amaze’, ‘to astonish’. In the 12th and 13th centuries the meaning of *mirar* was the etymological meaning in Latin ‘to amaze’. In the 14th century, this meaning evolved towards the meaning ‘to contemplate’, but still with an emphasis on the curiosity factor. Finally, in MSp this verb substitutes the OSp *catar* and comes to mean to ‘to look at’. According to the Corominas and Pascual (1983)(henceforth DCECH) this development is common to Portuguese and Catalan, whereas in the other Romances, the meaning ‘to contemplate’ has been kept until the present day. This meaning has also been kept in the Basque verb *miraritu* ‘to amaze’, derived from the noun *mirari* ‘miracle’.

3.2. HEARING

Indo-European words for hearing often come from the physical domain, from the physical organ of hearing, i.e. the ear, hence Lat *audire* < **aus-dh* from the root **aus* ‘ear’.

The English verb *hear* comes from ME *heren* < OE (Anglian) *heran* < Oteut **haurjan*. Cognates outside Teutonic are unknown. There is a theory that it might have a connection with the root *auz-* ‘ear’ and hence with Lat *audi-re*, and Gk ακουειν *akovei*, but this is extremely doubtful. The English verb *listen* comes from

⁸⁷ *Behatu* is already present in Etxepare (1545), but Sarasola’s dictionary dates it to Leizarraga (1571).

⁸⁸ See Lapesa (1980), for more information on the history of the Spanish language

ME *listen* < OE *hlýsnan* derived from the Indo-European root **K'leu-s* 'hear' or 'listen'.

In Basque there are two main verbs: *entzun* and *aditu*. As in the case of *ikusi* 'to see', the verb *entzun* 'to hear' has also these synthetic forms, for example, *nik danzu-t* (I.ERG hear) 'I hear'. The fact that they have these synthetic forms supports the claim that *entzun* is a word of Basque origin (Michelena [1985] 1990: 114; Azkue 1905). Some authors (Schuchardt 1923, 1925; Lhande 1926; Löpelmann 1968) have argued that this word comes from the Lat *intensiōnem*, the accusative of the noun *intensiō* from the verb *intendēre* 'to stretch out', 'to direct one's attention to'.

The Latin word *intendēre* has given way to related words in Romance languages, cf. Sp *entender* 'to understand', Fr *entendre* 'to hear', and It *intendere* 'to understand'. This is not the case in Basque. It is very strange that in the Romance languages the Latin *intendēre* has given words related to understanding and not in Basque. Fr *entendre* should be the only similar shift to the Basque one, but as explained later on, originally this word also meant 'to understand'. An analogy with the Basque word is likely to be impossible. The verb *aditu*, on the other hand, seems to come from Lat *audire*.

The etymological origin of the Spanish verb *oír* is the Lat *audire*, cognate of Gk αὐδή *aùde* 'voice'; this comes from the verb αὐω *aùo* 'to howl', 'to cry out'. According to the DCECH it is found in Berceo (13th ct.), and in the future tense a residual *-d-* from the Latin word can be still seen (fut. *odredes* 'you will hear'). This word has been inherited by all Romance languages, although in some it is no longer used for the hearing sense; for instance Fr *ouïr* 'to hear' has been replaced by *entendre* (Lat *intendēre* 'to stretch out', 'to direct one's attention'), which originally in OFr meant 'to understand', as it does in most of the Romance languages which took this Latin word. Another curious example is the substitution of the verb meaning 'to hear' by the verb meaning 'to feel'. This happened in Italian, where *sentire* (Lat *sentire* 'to feel') means 'to hear' and in Catalan *sentir*, 'to hear'. It is also possible to use *sentir* to mean 'to hear' in some varieties of Spanish, for example in Argentina, Chile, Colombia, Venezuela and Puerto Rico. Although it could be thought that the reason for this substitution in Argentina was due to the influence of Italian and its usage of *sentire* as an auditory verb, the fact that some other varieties

of Spanish as well as Catalan share this usage makes it implausible. According to the DCECH the reason may lie in the fact that *oír* is too short, and that in Spanish Creole languages, due to a phonetic rule which replaces *u* by *o* (in hiatus), there is an intolerable homonymy with *huir* ‘to run away’. A way of differentiating these two words is the use of *sentir* ‘to feel’. The semantic closeness between *sentir* and *oír* has been present in Spanish for a very long time; for example in *El Quijote*, Cervantes (16th ct.) uses both forms for audition but always with the following distinction: *oír* indicates a clear and distinct sensation (sound) and *sentir* is used whenever the type of perception is not specified and, if referring to audition, when the sound is very soft or vague. The verb *sentir* better represents this vagueness⁸⁹.

The Spanish verb *escuchar* comes from the old *ascuchar*, which is a development of the Vulgar Latin form **ascultāre*, from Lat *auscultāre* ‘to listen’ (*auscultāre* is in itself a compound of *aus* (< *auris* ‘ear’) and *cultare* < *clutare* (frequentative theme of *cluere* ‘to be known as’). It is found as early as the *Cid* (12th century) (*auscuchar*) and Berceo (13th century) (*escuchar*). An interesting word derived from this root is *escucha* ‘spy, bug’: An *escucha* was the sentinel in the night shift, which comes from an old meaning of the verb *excubo* ‘to listen in the night’. This is interesting because it emphasises the fact that *escuchar* is not only hearing but hearing with attention. In the darkness of the night where the sense of vision cannot be used as much as during the day, humans have to rely on other senses and hearing seems to be the most reliable one. However it is not only the perception of sounds that matters here, but also the perfect identification of those sounds.

3.3. TOUCH

In English there are two central verbs for the sense of touch. The first one is *touch*, which was introduced in ME from Ofr *touchier*. This word is the onomatopoeic formation from the syllable *toc* that gave origin to all these Romance cognates. Another possible origin proposed by Diez and now largely rejected was linking the Romanic *toccare* with OLG **tokkôn*, **tukken*, MLG *token*, *tucken* ‘to draw or to pull with force’, ‘to pluck’, but, according to the OED, the change of

⁸⁹ For more examples on *sentir* and *oír* see DCECH p. 267

meaning from ‘to pull’ to ‘to knock’ is inexplicable. The second word is the verb *feel*. It corresponds to ME *felen* < OE *felan* ‘to examine by touch’. This verb is derived from Ger **foljan* ‘to feel’, which in turn is related to Lat *palma* ‘palm’ (→ *palpare* ‘to touch’), Skt *pani* ‘palm’.

In Basque the central verb of this sense, *ukitu*, first appeared in writing in 1617. Along with its dialectal variants *ikutu* and *ükütu*. According to Löpeltmann (1968), *hunkitu* and *ukitu* could come from a possible **tuki* with the same origin as Spanish *tocar* and its Romance cognates. However this is highly implausible because the loss of a voiceless plosive at the beginning of a word is not a common phenomenon. *Haztakatu* and *haztatu* are both more common in the Northern dialects and the latter was already present in Leizarraga (1571). Both verbs come from the noun *hazta* which means both ‘weight’ and ‘sense of touch’. The relationship between these two meanings is connected to the hand which in the first meaning is the means of weighing and in the second is the means of touching. As the LMD clarifies: “étymologiquement, action de vérifier la pesanteur d’un objet en le soulevant de la main, ou le prenant aux bras”. Thus it seems that a semantic expansion took place early in the language, from the physical act of weighing to the other physical act of touching. As noted in Section 2.3.3, this physical weighing has shifted to an abstract meaning, as it now means ‘to weigh, to consider’. This shift is somehow predicted and expected, as when we have to judge something we always place the pros and cons of the problem in a balance and we take the decision in accordance with the reasons that have more weight⁹⁰.

Tocar is the main verb of the sense of touch in Spanish. The DCEDH argues that this verb has its origin in the onomatopoeic formation from the syllable *toc*, which imitates a knock, and that one of its first meanings would have referred to the ringing of the bells or other percussion instruments. Another sense of this verb that the DCEDH considers to be very old is ‘to knock on the door’ *tocar a la puerta*,

⁹⁰ This metaphorical ICM could be called: JUDGEMENTS ARE DECIDED IN A BALANCE, where expressions such as *to weigh up the pros and cons*, *lightweight character*, *counterbalance*, *tremble in the balance*, *turn the balance* and so on can be included. (For a full list of these metaphors, see Wilkinson 1993).

which reflects the onomatopoeia very well⁹¹. In my opinion the physical touch in Spanish should be divided into two groups, one which refers to the sense of touch as perception, and one which is more related to the sound and hence closer to its etymological origin. If touch has its origin in an onomatopoeia, which expresses the action and sound of a knock, then this word must have undergone an extension of meaning in the following direction⁹²:

knock-percussion instrument > general perceptive touch.

The English and Basque data also support this statement. In Basque as we have already explained, the verbs of touching are not related to playing instruments. In English *touch* was used in this sense, but now is not used in this way. This is understandable as *touch* was a loan from OFr *tochier*, which is derived from the same onomatopoeia. But if we take the Anglo-Saxon word for *touch*, i.e. *feel*, it cannot be used in this sense.

3.4. SMELL

The English verb *smell* has its origin in OE but it is not recorded, and not represented in any of the cognate languages. It appears in ME as *smellen*. It seems that E *stink* < OE *stinc* was first used for neutral smell and then, when *smellen* was introduced it came to mean 'bad smell'. A similar process takes place with *stench*, OE *stenc*. This verb already meant 'bad smell', but nowadays it is even stronger than *stink*.

Sniff comes from ME *sneuien*, *sniffen* from a Scandinavian origin. It is also proposed that this verb has an imitative origin, as in *snuff* (OED).

The Basque verb *usaindu* is composed of *usain*. *Usai* means 'odour, smell, aroma' and then *-tu*, which is one of the verbal suffixes for the perfective participle (>Lat participial suffix *-TU*)⁹³. *Usmatu* (*usmotu*) is derived from *usma* 'sense of

⁹¹ This meaning of the verb *tocar* is now still in full usage. However, not only the expression *tocar la puerta* is possible, but also *tocar el timbre*, lit. 'to touch the buzzer', 'to ring the bell'. The expression should be *pulsar el timbre* 'to press the buzzer'. This is an example of lexical innovation, i.e. when an old word becomes adjusted to the modern uses.

⁹² Apart from this extension of meaning to a more general field, within the 'sound field' *tocar* is nowadays used for any instrument, not only percussion or knocking, but also in the general sense of playing instruments.

⁹³ See Trask (1995) for a description of Basque non-verb forms and their etymological origin.

smell, guess'; *usmo*⁹⁴ 'guess, conjecture'; and *-tu*, a verbal suffix (see above). Finally, *usnatu* is derived from *usna* 'sense of smell, sagacity' and *-tu*, a verbal suffix (see above). As we shall see in the etymological analyses of the Spanish verbs below, the origin of the Basque verbs is here considered to be related to the Sp verb *husmear*.

The Spanish verb *oler* comes from Lat *olêre*. In Latin this verb was originally used intransitively as a percept verb, i.e. only with the subject of the thing that emits odour, whereas *olfacere* (Sp *olfatear*) was left for transitive uses (as an activity and experience verb). According to the DCECH, this distinction was no longer present in Berceo (13th ct.), where a nominalisation of the Sp verb *oler* covered both instances.

Another characteristic of Sp *oler* is that this verb refers to the perception of good and bad smells indistinctively. Other Romance languages use different verbs to distinguish between good and bad odours. For instance, Fr *sentir* 'to smell' and *puir*, *puer* (< Lat *putere* 'to stink'), *empester* 'to stink'. Similarly in It *sentire*, *odorare* 'to smell' and *puzzare* (< Lat *putêre*) 'to stink'. Portuguese also seems to have only one verb: *cheirar* 'to smell', 'to stink'. Portuguese also has *empestar* for 'to smell out' (cf. Fr *empester*, Sp *apestar*).

An interesting point here is the fact that some Romance languages have adopted the Latin word *sentire* in the place of *olêre-olfacere*. *Sentire* 'to feel' is usually the verb used for describing general perception, and as seen in the section on hearing, it can also mean 'perception by the ear'.

The Latin verb *olêre* itself seems to come from an IE root for 'smell' *od-* (cf. Gk οζω *ózo* 'I smell'). *Olfatear* comes from Lat *olfactâre*, verbal form of *olfactus*, which is the supine of *olfacere* 'to smell'.

Both *oler* and *olfatear* have concrete and non-concrete meanings. The concrete meanings 'to perceive' and 'to emit a smell' are already present in their Latin cognates: *olêre* 'to give off a smell', 'to smell sweet', 'to stink' and *olfacere* 'to detect the odour of', 'to sniff at'. Their figurative meanings, however, seem to be particular to the Spanish verbs as the Latin verbs do not share them.

⁹⁴ This is very interesting as the main meaning of the noun is no longer 'smell' but the figurative one, 'suspicion, guess, conjecture'.

The etymology of *husmear* is very interesting. According to the DCECH, the primitive forms of this verb seem to be *usmar*, *osmar*, which have the same origin as Fr *humer* ‘to sniff’, ‘to inhale’, It dial *usmar* ‘to sniff’, ‘to smell an animal trail’, It *ormare* ‘to follow a trail’, Rum *urmà* ‘to follow’. These verbs find their origin in Gk *osmasthai* ὀσμάσθαι ‘to smell’, ‘to sniff’, derived from *osmé* ὀσμη ‘odour’. In Spanish, this word appears quite early in the language. In the *Glosas Silenses* (10th ct.) *osmatu* is found and in *La Pícaro Justina* (17th ct.) the modern form *husmear* is already present.

The DCECH states that in the Iberian Peninsula, the OSp **osmare* ‘to smell a trail’ and the Lat *aestimare* ‘to appreciate’ were often mistaken, and that this phonetic and semantic hesitation also occurred in Basque in verbs such as *asmatu*, *usmatu* and *usnatu*, which mean ‘to perceive smells’, ‘to make up and to suspect’. A few comments should be made here. It seems quite reasonable that the verbs discussed above all come from Latin, however the generalisation that has been made in this dictionary is not accurate enough. Although *asmatu* and *usmatu* could be similar to the case in Spanish, *asmatu* does not have any of the meanings above, except ‘to make up’, ‘to invent’, which in turn is not shared by the other two. *Asmatu* means ‘to invent’, ‘to devise’, ‘to plan’, ‘to think of’, ‘to make up’, ‘to guess’, ‘to conjecture’, ‘to imagine’, ‘to figure out’ (GALW). Later on in the discussion the DCECH states that the Basque words *sumatu*, *somatu* and *susmatu*⁹⁵ could be variations of the same verb *husmear*, from the OSp *sub-osmare*, but as Cat has preserved the group *-sm-* up to now it could also come from an old alteration of **osumare*. From all these suppositions, it would appear that the Basque words come from Spanish. However, the fact that *osmatu* appears in the *Glosas Silenses*, which are well known as having Basque elements, and the variation in Basque between *o* and *u* (cf. *somatu-sumatu*) are inconsistent with this conclusion.

⁹⁵ Michelena ([1985] 1990: 292) and Mujika (1982: 209) argue that the *s-* in *susmatu* is an expressive *s-*, which added to the verb *usmatu*. *Susmatu* nowadays does not mean ‘to smell’, but ‘to suspect’. However, the fact that this verb is formed from the noun (*s*)*usma* ‘smell’ makes it very interesting as an example of the direction that semantic change follows, i.e. from concrete to abstract.

3.5. TASTE

The sense of taste is interesting from an etymological point of view. The English verb *taste* and its cognates have given rise to a great deal of discussion as experts do not agree on whether it comes from Lat **taxitare* or whether it has an onomatopoeic origin.

The proto-form suggested is IE **g'heus*. This form is present in words for 'taste' in Greek *genomai* and Latin (Romance) *gustâre*. However, in Germanic and Celtic it appears in words which are related to 'to try' or 'to choose', for example, Gothic *kiusan* 'to make trial of', OE *ceosan* 'to choose'. Finally, in Indo-Iranian languages it appears in words linked to 'to enjoy', such as Skt *jus-* 'to enjoy', 'to be pleased'. Buck (1949:1030) states that the direction of semantic shift is not clear because the development could have equally gone from 'taste' > 'try, choose' > 'enjoy' or from 'try' > 'taste' > 'enjoy'.

The central verb of taste in Modern English is *taste* and in Basque, *dastatu*. Spanish does have an archaic word related to the two: *tastar*. The etymological origin of these words and their cognates in other languages is uncertain and has brought about much discussion and disagreement among linguists. The following is a brief review of this issue.

One of the proposals is that these verbs come from Vulgar Latin **tastâre*. This word would be the result of a merge between *tangere* 'to touch' and *gustâre* 'to taste'. The DCECH rejects this origin because *tangere* and *gustâre* were not synonyms in Latin and it is very difficult for two words with different meanings to be blended.

Another proposal is that they come from Vulgar Latin **taxitâre* > *taxâre*. According to Ernout and Meillet (1959), *taxâre*, with the meaning 'to touch firmly and often', is not a typical word either in Romance or in Latin literature. It could have been a pseudo-etymological fictitious word created by Aulo Gellio, because *taxâre*, which means 'to tax, to evaluate' or 'to reprimand, to censor', does not come from *tangere* 'to touch' but from Greek *tassei*. To this explanation, the DCECH adds the fact that the development **taxitâre* > *tâter* would only be phonetically possible in

French, because the other Romance languages would not have allowed a syncope, either after the voicing of the *-t-* or in any case.

Finally, the last approach proposes an onomatopoeic origin: *tas-tas*. The DCECH considers this origin as the only sensible one. The fact that the meaning ‘to knock’ appears in all Romance languages in their first stage seems to be reason enough to accept this view. In Modern Italian the verb *tastare* keeps the meaning ‘to touch’ (for example in the case when a blind person is feeling his way with a stick; cf. Sp *andar a tientas* ‘to feel one’s way’).

It is difficult to decide which of these proposals is the correct one. Based on the meanings that this group of words had and now retain, the relationship between touch and taste becomes very evident. Although the DCECH states that the change from the meaning ‘to feel (one’s way)’ to ‘to taste’ is very easy from an ideological point of view (as ‘to taste’ is lexicalised by different words related to physical and spiritual sensations in many languages) this change is not so straight forward.

The main verb of taste in English is *taste*. It comes from OFr *taster* ‘to touch’, ‘to feel’. When this loan was first introduced into Middle English it kept some of these meanings related to the sense of touch, but now these are archaic. Another interesting point in this verb is that according to the OED, it could also refer to the perception by some other sense, i.e. smell. *Smack* is no longer used very much, however, it was the OE word for the sense of taste. OE *smaec* ‘taste, flavour’, hence *smecgan* ‘to taste’, is related to OHG *smoc* (> MHG *smacken* > G. *schmacken* ‘to taste’). Although its main meaning is ‘to have a distinctive flavour or taste’, it can also refer to the sense of smell, when it refers to the characteristic smell or taste of something (*To smack of the sea* (COL)).

It seems that Basque has borrowed the words to express taste from other languages (i.e. Romance). The main verb of the sense of taste is *dastatu*. The etymology of this verb is discussed above, however, we may add to that information what Agud and Tovar (1989-) established as its direct source. These authors agree with the DCECH on the fact that these verbs do not come from Lat. **tastāre*, but that *dastatu* comes from Romance, in particular from Old Occitanian *tastar* ‘to taste’. Azkue (1905) also supports this idea. *Dastatu* was present in the language from an early stage, for example it is already found in Etxepare (1545). From all the

examples I have reviewed, it seems that Basque took this verb only with the meaning ‘to taste’ in the physical and figurative sense. This verb has a rich dialectal diversity. In the Northern side *dasta-* was the only form until the 19th century. By the middle of the 19th century the variant *jasta-* is found used with the same frequency, but by the end of the century this form has superseded the former one. The Souletin dialect uses *txeste*. In the South *dasta-* is the only form found until the 20th century. From the 1920’s onwards other variants are also used: *jasta-*, *txesta-*. Finally, in the Roncalese dialect there is the variant *testatu*.

The sense of taste in Spanish is quite unique because it has kept the two verbs that were used in Latin for this sense with the same main meanings. In the first place, there is *saber*. It comes from Latin *sapere*, which meant ‘to taste’ and ‘to be wise, to know’. This verb replaced Latin *scire* in all Romance languages, except in Romanian and Sardinian. The meaning of ‘to have a taste’ is only preserved in Italian and in the Iberian Romances, whereas in Modern French, for example *savoir* (< Lat *sapere*) only means ‘to know’; some reminiscences of its etymological meaning can be seen in the noun *saveur* (< Lat *sapor*) which means ‘savour, taste’. The fact that these two different domains, the perception of tastes and knowledge, are present in the same word, is what makes Sweetser state that “the sense of taste is here evidently connected not merely with general experience or perception, but with mental experience” (1990:37). Although it is true that the sense of taste is linked to the mental domain, I find it very difficult to accept this assertion on the basis that in Latin these two meanings were lexicalised by the same verb. This only happens in Latin and later, in Spanish, but in neither of the other languages of the sample. It is true that the words that we have been discussing here so far, Basque *dastatu* and English *taste*, are not original words from those languages but loans from other languages, i.e. Romance, but it is very strange that these words have not developed such a meaning. If it is true that these semantic changes from the concrete domain to the abstract domain are cross-linguistic and not language specific, we cannot make such a generalisation that the sense of taste is linked to the mental domain only on the basis of this case in Latin, because if it is not shared by other languages, it means that it is just a particular fact of Latin and its descendants.

Saber is found in Spanish right from its origins (*Glosas* (10th ct.), *Cid* (12th ct.)), and since then it has developed the meanings it inherited from Latin⁹⁶. In the sense of ‘to know’, *saber* now also means ‘to realise’, ‘to find out’, ‘to hear about’ and ‘to be able to’. This last meaning is very important because in these cases *saber* behaves like a modal verb. It requires the construction *saber* + infinitive, as in (1):

- (1) María *sabe* / no *sabe* nadar
 mary knows / no knows swim
 ‘Mary can/can’t swim’

This could be considered a case of grammaticalisation, because the verb has lost part of its lexical meaning to become a kind of function word (Hopper and Traugott 1993).

Gustar is the other main verb of the sense of taste in Spanish. It comes from Latin *gustâre* ‘to taste’. In Berceo (13th ct.) this verb appears as *gostar*, but *gustar* is the standard form since the end of the 15th ct. The development of the syntax of this verb is very interesting. In the Middle Ages *gustar* was used transitively, with the person who tasted as the subject. In the Renaissance (Spanish Golden Age in Literature) the intransitive construction *gustar de algo* (lit. ‘like of something’) was quite frequent. The subject was the person who performed the action. Together with this syntactic development, there is also a shift in the meaning from the neutral ‘to taste’ (as an experiencer-based verb) to ‘to take pleasure’ to the current usage ‘to like, to enjoy’⁹⁷. These developments can be represented as follows:

Middle Ages		Renaissance		Nowadays
transitive	→→	intransitive	→→	intransitive
subject:agent		subject:agent		subject:experiencer
‘taste’		‘taste, enjoy’		‘enjoy, like’

⁹⁶ In Latin, *sapere* also meant ‘to smell of’. This meaning does not seem to occur in Spanish.

⁹⁷ Presently, *gustar* with the meaning of ‘to enjoy’, ‘to like’ usually refers to other experiences but not food or drink. When you take pleasure in what you are eating and drinking, the verb *degustar* (< Lat *de-gustâre* ‘to enjoy by the experience of taste’) is the correct verb to use.

Saber and *gustar* are distinguished by Roque-Barcía (1902) on the basis of sensibility. According to this author *gustar* refers to the action of the gustative organs, whereas *saber* refers to the pleasure or pain that we feel, when we taste. It is related to sensibility. *Gustar* seems to be a condition for *saber*, because without *gustar* something one cannot *saborear* it (see Section 2.3.5).

3.6. CONCLUSIONS

In this chapter, I have presented a brief overview of the etymology of perception verbs in English, Basque and Spanish. The purpose of this chapter has not been to discuss in detail either how or why the meanings in these perception verbs have evolved in the way they have, or what their etymological origin is – this falls beyond the scope of this thesis, whose aim is to analyse the polysemy of the semantic field of perception verbs from a synchronic perspective.

However, a study of synchronic polysemy would be incomplete if it lacks any reference to the diachronic development of the semantic field under analysis. Words do not change, loss, or add meanings suddenly or whimsically; words are polysemous as a reflection of diachronic semantic changes. I have included a chapter on the etymology of perception verbs in this thesis for several reasons. On the one hand, to put together in one place all the information on the etymological development of the perception verbs discussed in this thesis. Other chapters in the thesis will make reference to this chapter for the relevant etymological information. On the other hand, these etymological data have been aimed at supporting some of the main claims put forward in this thesis, as well as at providing a starting point for future research on the issue of semantic change (see Chapter 4). One must not forget that the same questions of how and why polysemy takes place can be applied to semantic change. And it is a commonly agreed possibility among cognitive linguists to suppose that the same mechanisms that explain synchronic polysemy can be used to explain semantic change (see Sweetser 1990, Geeraerts 1997).

Etymology is important because it gives us the necessary background information about the development of a particular word in a particular language. For instance, the case of *susmatu* ‘to suspect’ in Basque. Without any previous etymological knowledge, it would be impossible to ascertain that this word is related

to the sense of smell. We would have to simply accept that this word in contemporary Basque means ‘to suspect’. However, the etymology of this word shows that it is related to smell (see Section 3.4) and that at some point in history, the meaning of this word shifted from physical smell to abstract suspect. As we know from the analysis of the conceptual mappings in the sense of smell in Chapter 2, the connection between physical smell and abstract suspicion is also present in the polysemous verb *usaindu* ‘to smell’. Therefore, it seems that this link between these two different conceptual domains is quite common and strong. Etymological data provided us with further information to support such a claim.

Etymological data is also very useful when analysing cross-linguistic polysemy, i.e. the meaning extensions that take place in one semantic field in different languages. One of the theoretical hypotheses in this thesis is that most semantic extensions of perception verbs are cross-linguistic because these links between different conceptual domains of experience are motivated by our understanding and knowledge of the world, which is shared by all humans with the same cultural background. A way to support the cross-linguistic character of these mappings is to look at languages from different families. Take, for example, the link between vision and knowledge. As was shown in Chapter 2, this mapping not only occurs in English and Spanish, two IE languages whose sight verbs derive from the same IE roots, but also in Basque, a non-IE language whose vision verb *ikusi* does not seem to come from any IE root.

In these last two chapters I have described the semantic field of sense perception verbs. The description of the semantic extensions in these verbs, as well as their etymological origins, are the ‘raw’ material that will provide the data necessary to illustrate and support the theoretical claims on polysemy in the following chapters.

CHAPTER 4: PROBLEMS IN POLYSEMY

In the preceding chapters, I have offered a typology of the different meanings that perception verbs convey in present-day English, Basque and Spanish. I have also provided an etymological description of these verbs to support the cross-linguistic character of such extended meanings. It is on the basis of these data that I will construct the theoretical hypotheses in this thesis. These hypotheses will explain why and how these polysemous senses happen.

In this chapter, I review two different approaches to meaning extension. Sweetser's (1990) semantic account of perception verbs, and Pustejovsky's (1995) Generative Lexicon. I set out the advantages of these approaches that will be useful for my own analysis, as well as the gaps in these models that need to be addressed.

Sweetser (1990) investigates the multiple meanings in the semantic field of English perception verbs. She shows that lexical polysemy cannot be understood independently of human cognitive structure. The fact that everyday cognition is metaphorically shaped, at least partially, helps us to understand the way in which the senses of polysemous words are related. Sweetser's approach to semantic extension is presented and discussed in Section 4.1.

Although I agree that metaphor is the primary cognitive mechanism by which the structure of human experience is created and extended, metaphor cannot entirely explain why some semantic changes do not shift towards a more abstract meaning, but remain physical. Metaphor also has difficulty in explaining the shifts of meaning which are caused by the different arguments in the sentence. In order to solve this problem, Pustejovsky's Generative Lexicon is analysed in Section 4.2, followed by a discussion of this framework when applied to our data.

Finally, I draw some conclusions in Section 4.3.

4.1. SWEETSER'S MIND-AS-BODY CONCEPTUAL METAPHOR

The fact that certain verbs of perception could refer to other non-physical meanings has been long established. In Bechtel's (1879) study of the different meanings that sense verbs can convey, he states that subjective perception expressions originated in the more objective sense expressions, which in turn have a more concrete origin, in the changes detected by the sensory impressions. Kurath (1921) notes how Indo-European words for perception, those referring to physical actions accompanying the relevant emotions and those referring to the organs affected by those physical actions, developed into words for emotion. Buck (1949) devotes a whole section to the study of the etymological relations between Indo-European sense perception verbs. While these studies are more focused on the etymologies and different senses of these verbs without giving a specific theory of why they are related⁹⁸, Sweetser's main aim is to provide a motivated⁹⁹ explanation for the relationships between senses of a single morpheme or word and between diachronically earlier and later sense of a morpheme or word.

Sweetser proposes a semantic link-up that can account for this pervasive tendency in the Indo-European languages to borrow concepts and vocabulary from the more accessible physical and social world to refer to the less accessible worlds of reasoning, emotion and conversational structure; what she calls the MIND-AS-BODY metaphor. This link-up between the vocabularies of the mind and body is not only rooted in some psychosomatic reactions (Kurath 1921). As Sweetser argues, in some examples psychosomatic explanations may be enough to account for some cases. For instance, the fact that it is possible to have *emotional tension* or to *feel low* may be linked to the muscular states of tension and limpness that go with these mental states. However, other expressions such as *bitter anger* or *sweet revenge* cannot be linked to any direct physical taste response of bitterness or sweetness, they should be regarded as metaphorical.

⁹⁸ Kurath attributes this diachronic development of emotion words to the psychosomatic nature of emotions.

This MIND-AS-BODY metaphor is motivated by correspondences between our external experience and our internal emotional and cognitive states. These correspondences are not isolated; they are parts of a larger system. This metaphor involves our conceptualising one whole area of experience (i.e. mind) in terms of another (i.e. body), and therefore, Sweetser suggests that MIND-AS-BODY can be considered as what Lakoff and Johnson (1980) regard as a ‘conceptual metaphor’.

Another important point is that correspondences between these two domains of experience are unidirectional¹⁰⁰ (Sweetser 1990: 30): from the vocabulary of bodily experience to the vocabulary of psychological states. In the case of English perception verbs, the metaphorical mappings take place between two domains of experience: the vocabulary of physical perception as the source domain and the vocabulary of the internal self and sensations as the target domain. Although, in most cases, the unidirectionality of this mapping is preserved, as we shall see later on in the discussion, there are some exceptions to this general tendency.

With this MIND-AS-BODY metaphor as a background, Sweetser goes on to analyse the routes into and out of the domain of physical perception. As explained in Chapter 3, this thesis is not focused on the historical development of the meanings of perception verbs, but on the present-day polysemous senses conveyed by these verbs. Nevertheless, I include here Sweetser’s description of the routes followed by perception verbs, not only to give a full overview of her approach, but also because as she states “through a historical analysis of ‘routes’ of semantic change, it is possible to elucidate synchronic connections between lexical domains” (1990: 45). The routes she maps out for English sense-perception verbs are sketched in Table 4.1:

⁹⁹ By ‘motivated’ Sweetser understands “an account which appeals to something beyond the linguist’s intuition that these senses are related, or that these two senses are more closely related than either is to a third sense” (1990: 3).

¹⁰⁰ Recent research within the Cognitive Linguistics framework, i.e. Fauconnier and Turner’s theory of ‘blending’ (Fauconnier 1997; Fauconnier and Turner 1994, 1996; Turner and Fauconnier 1995) and some related work on recursive metaphorical chains (see Rohrer, 1997) seems to introduce a new perspective on this unidirectionality in metaphorical mappings. As Barcelona (1997: 13) suggests, “these studies point towards the existence of multiple projections, although not in the sense suggested by interactionalist theories of metaphor, such as Black’s (1962, 1993)”.

SENSE	SEMANTIC SOURCES	TARGET DOMAIN
VISION	-Physical nature of sight: light (<i>*leuk-</i> 'light'), the eyes (Lger <i>oegen</i> 'eyes'), facial movement... -Metaphors of vision: <i>behold, catch</i> sight of... < Lat <i>-scipio</i> 'seize', <i>see</i> < <i>*sek^w-</i> -Basic IE vision roots: <i>*spek'-</i> > <i>inspect, *weid-</i> > <i>witness</i>	-Physical sight → Knowledge, intellection -Physical vision → meant 'vision' -Cases with only mental meaning
HEARING	-Physical domain: <i>*aus-</i> 'ear' -IE roots: <i>*kleus</i> 'listen' → -Onomatopoeic origin <i>crash</i> -Verbs of hearing: Cl Gk <i>kluo</i> , Eng <i>listen</i> , Dan <i>lystre</i> 'obey'. →	-Not sound but content of heard speech -Physical sound -'listen, heed'
SMELL	-It frequently comes under general sense perception. → E.g. Fr <i>sentir</i> 'feel', 'smell' < Lat <i>sentire</i> -If different from general tactile sensation, they often derive from specific physical sensations: <i>a sweet smell</i> ; or from aspects of the physical act of perception: Eng <i>reek</i> , G <i>rauchen</i> 'smoke'	-Few abstract or mental connotations. E.g. <i>Bad smell</i> is used in English to indicate bad character or dislikeable mental characteristics. E.g. <i>This stinks, stinker</i>
TASTE	-IE root: <i>*g'eus</i> (Lat <i>gustare</i>). It could have meant 'try' (Gothic <i>kiusan</i>) or 'choose' (OE <i>ceosan</i>), rather than 'taste'.	-It seems universally to be linked to personal likes and dislikes in the mental world.
TOUCH	-General sense of perception -Physical feeling: Lat <i>sentire</i> , GK <i>pascho</i>	-Emotional feeling. E.g. <i>deeply touched</i>

Table 4.1: Sweetser's routes for English sense-verbs.

In the case of vision, Sweetser identifies a basic metaphorical understanding of this sense that leads to the connection of vision to intellectual activity. Some vision terms involve physical perceptions or manipulations and have correlates in the domain of intellectual operations. As important as the routes for sense perception are the patterns that unify these semantic changes. In this case, Sweetser suggests three reasons for this parallelism between vision and intellection: (i) Vision is our primary source of objective data about the world. It gives us more information than any of the other senses, and it appears that children rely most heavily on visual features in their early categorisation. (ii) The focusing ability of vision that enables us to pick up one stimulus at will from many, to differentiate fine features. (iii) Vision is identical for different people who can take the same viewpoint. Therefore, it seems to provide a basis for shared public knowledge.

Indo-European hearing words usually come from the anatomical domain, from the physical organ of hearing, i.e. **aus-* 'ear'. A common characteristic for

nominals from IE verbs of hearing is the fact that they do not denote sound (the physical thing heard), but the content of heard speech. The physical sound has often an onomatopoeic origin (Buck 1949), as for example, Eng *bang* or *pop*, Bq *tirots*, *zart*, *punpa* ‘bang’, *blaustrada*, *zanpa* ‘crash’ or Sp *pum* ‘bang, pop’, *patapum* ‘crash’. In hearing, it is very interesting to note how the proposed unidirectionality of meaning change from concrete to abstract is not totally universal. Words meaning mental attention or understanding can come to mean physical hearing. While in most Romance languages, the words derived from Lat *intendere* ‘stretch out, direct one’s attention to’ come to mean ‘understand’ (cf. Sp *entender*, It *intendere*), in French, the semantic development went on and in Modern French, *entendre* means primarily ‘hear’.

In Sweetser’s opinion, the sense of hearing is similar to the sense of vision, the most salient sense. Hearing shares with vision some of its characteristics when speaking about mental activity, but it is not the same kind of activity. In hearing, the voluntarily on-off control of vision is no longer applicable, we cannot control the reception of sounds¹⁰¹.

The function of hearing is regarded as linguistic communication, as a means of intellectual and emotional influence on each other; this is carried out in an effective manner via the vocal organs and the auditory sense-channel. The sense of hearing, therefore is connected to: (i) Heedfulness and internal receptivity, (ii) Internal reception of ideas, understanding what is heard.

This readiness to internally receive and understand implies a readiness to subject oneself to the influence of the speaker’s content, and perhaps this readiness to further respond in the way desired is what has caused the verb to also mean ‘obey’. As Sweetser states “internal receptiveness to the speaker’s intentions which might subsequently lead to compliance with the speaker’s requests” (1990:41). But if the sense connected par excellence with the sphere of understanding and knowledge is vision, the question is what the difference between visual and auditory understanding

¹⁰¹ It is true that we cannot close our hearing perception, our ears, in the same way as we can close our eyes, if we do not want to see something. However, it is equally true that we can decide when to pay attention to something we are hearing and when not. In this case, I think we do have some kind of on-off control. This is reflected in the usage of the verbs of hearing, as for instance in the sentence: *I heard her but I did not listen to her* (Sp *la oí pero no la escuchaba*).

is. For Sweetser the difference lies on the fact that “hearing is connected with the specifically communication aspects of understanding, rather than with intellection at large” (1990:43).

These two senses, vision and hearing, are usually called in the literature (Sekuler and Blake 1994; Viberg 1984) ‘distant senses’ because contact is not needed in order to perceive through them. According to Sweetser, it is this distance requirement that links these two senses to objectivity and intellect, whereas in the cases of touch and taste – ‘contact senses’ –, their necessity for closeness with the thing perceived makes them be connected with subjectivity, intimacy and emotion¹⁰².

The sense of touch has often been related to two fields: the general sense of perception and the emotional feeling. As Sweetser states, in many IE languages, at least one of the words that denotes ‘emotional feeling’ is related to the domain of physical feeling (Sweetser 1990:37) and consequently, expressions such as *wounded*, *stroked*, *touched*, which belong to the touch and tactile domain can also be used for emotional sensations¹⁰³. She also states that in all IE languages, the verb meaning ‘to feel’ in the sense of touch is the same as the verb indicating general perception. For example, the verb *sentir* (Lat < *sentire*) in Spanish. However, it seems that this statement is overstated; in Russian, the verb for ‘to feel’ *чувствовать* is used in some forms (‘to touch’, ‘to taste’, ‘to smell’ experience verbs) but in itself it cannot describe any sensory modality (Moiseeva 1998: 160).

The Indo-European root for taste seems to be *g'eus, which developed two different meanings in Romance languages, i.e. ‘taste’, and in Germanic and Celtic languages i.e., ‘try’ or ‘choose’. The sense of taste seems to be linked to personal likes and dislikes in the mental world. Perhaps the reason why this is so lies in the fact that the sense of taste is most closely associated with fine discrimination. According to Buck (1949:1031), in Hindi, there are six principal varieties of taste with sixty-three possible mixtures and in Greek six, including the four fundamental ones: ‘sweet’, ‘bitter’, ‘acid’ and ‘salt’.

¹⁰² The implications of this contact/non-contact requirement are discussed in great detail in Chapter 5, where I will characterise sense perception in terms of properties. These properties will constitute the bodily basis that constrains the creation of the extended meanings presented in Chapter 2. This will be discussed in Chapter 6.

4.1.1. DISCUSSION

Based on the cognitive semantic principle that language is based on human understanding and experience of the world, Sweetser claims that the paths of semantic change are one-way and lead from the external (socio-physical) domain to our internal (emotional, psychological) domain. In the case of English perception verbs, the source domain is the vocabulary of physical perception, whereas the target domain is the vocabulary of internal self and sensations. These domains are structured by means of metaphor. Finally, Sweetser suggests that these metaphorical mappings are not particular to one language, but constitute a cross-linguistic phenomenon.

In Chapter 2, I analysed the semantic field of sense perception in three different languages: English, Basque and Spanish. Based on these data, it can be said that – as Sweetser predicts – many of the semantic extensions in this field are shared by the three languages analysed, despite the fact that in some cases, each language had even more extended meanings that are not present in the other two.

In the previous section, I presented Sweetser’s metaphorical mappings for English perception verbs. These metaphorical mappings were:

VISION	→→→	KNOWLEDGE	
HEARING	→→→	HEED	→→→ OBEY
TASTE	→→→	LIKES / DISLIKES	
TOUCH	→→→	FEELINGS	
SMELL	→→→	DISLIKEABLE FEELINGS	

As shown in Chapter 2, these are not the only possible metaphorical mappings in sense perception verbs. What Kövecses (1995, in press) calls the ‘metaphorical scope’¹⁰⁵ of sense perception verbs is much larger than that proposed by Sweetser; even in cases, such as smell, where Sweetser claims that it “has fewer and less deep metaphorical connections with the mental domain than the other

¹⁰⁵ “The range of the application of particular source domains to particular target domains” (Kövecses 1995: 316).

senses” (1990: 43). Smell, for instance, is not only mapped into dislikeable feelings, but also into meanings such as ‘to investigate’, ‘to suspect’ and ‘to guess’ (Ibarretxe-Antuñano 1997).

Another factor that is not discussed in Sweetser’s analysis is that in some cases the extensions of meaning do not shift towards more abstract or metaphorical domains, but they remain physical. For instance, in the case of the meaning ‘to affect’ in the sense of touch illustrated in (1).

(1) Just don’t *touch* anything in my room

As discussed in Section 2.3.3, the meaning of (1) does not only imply physical contact but also a change of state. In (1), the person who utters this sentence does not want the other person to change the state / position of anything in his / her room.

Another example of this meaning can be seen in (2).

(2) Blackfly *touched* the flowers (COL)

This example states that a type of insect physically touched the flowers and since this insect is harmful to them, the flowers were physically affected.

As seen in Chapter 2, semantic extensions from physical perception onto a physical domain are not only found in the sense of touch. In the sense of smell, we have the meaning ‘to trail something’; in vision, ‘to visit’ and ‘to receive’ among others. These physical extensions of meaning are not taken into account in Sweetser’s analysis.

Metaphor is the cognitive device that Sweetser proposes as the structuring means to link the physical prototypical domain to more abstract domains. However, metaphor cannot explain or structure these physical extended meanings, because the mappings in these cases are not between a physical and an abstract domain, but between a physical and another physical domain. In Chapter 6, I will propose the process called Property Selection as a possible solution for this problem.

Another point that remains unanswered in her analysis is why certain source domains get mapped onto certain target domains; the reasons why it is possible to say *Mary smelt the joke* but not *Mary touched the joke*. In the Cognitive Linguistics

model, the bodily basis of these verbs should be taken as the motivation for such semantic extensions, but this approach does not discuss what it is exactly the bodily basis in the field of perception. In Chapter 5, I will characterise the five senses in terms of properties and state that these properties can be considered the bodily basis of such semantic extensions.

A related issue is also the question of how much of the source domain is mapped onto the target domain in these extensions of meaning. In other words, what and how much information from the source domain is selected and transferred onto the target domain.

It is commonly agreed among metaphor researchers that not everything from the source domain gets mapped onto the target domain. Lakoff and Johnson (1980: 52) call this partial map of the structure of the source domain the ‘used’ part of metaphor. However, in order to constrain metaphorical mappings it is not enough to say that there is a selection of the source domain, it is necessary to show exactly what it is that is partially mapped and what constraints are applied to that selection. Attempts¹⁰⁶ to constrain the mapping process in metaphorical production and comprehension can be found in Lakoff’s (1990, 1993) ‘Invariance Principle’¹⁰⁷, i.e. “metaphorical mappings preserve the cognitive topology of the source domain in a way consistent with the inherent structure of the target domain” (1993: 215). The Invariance Principle is useful in order to constrain the nature of those mappings: that is to say, it is not possible to map from the source domain structure that does not preserve the inherent structure of the target domain. The only problem with this principle is that it does not show exactly what part of the source domain is the one that must be consistent with the structure of the target domain.

In Chapter 6, I introduce the process called ‘Property Selection’ as a possible solution. Apart from providing an explanation for physical extended meanings, this process will show not only how some of the set of properties that characterise the

¹⁰⁶ These attempts are discussed in greater detail in Chapter 6.

¹⁰⁷ See also Lakoff and Turner (1989:82), Brugman (1990), Turner (1987:143-148, 1990, 1991:172-182, 1996).

source domain¹⁰⁸ are mapped onto the target domain, but also what properties are mapped.

It is precisely by this selection of properties from the source domain in the target domain that metaphorical mappings are constrained. The properties selected in the target domain must be part of the properties identified in the source domain and no others. The selection of properties does not only take place every time metaphor is used for extending the meaning of a word, but in every extended meaning. That is why this process can also account for semantic extensions that remain physical, for those extensions that lie outside the scope of metaphor.

Finally, another issue that is not discussed in either Sweetser's approach or in the general Cognitive Linguistics literature is the role that the semantic content of the different elements in a sentence plays in the overall meaning of that sentence, and thus, in the creation of polysemous senses. Well-known studies in this framework have assumed that polysemous senses are carried by single lexical items, without taking into account the semantic content of the co-occurring elements. Brugman's (Brugman 1981, Lakoff 1987) analysis of the preposition *over* is an example of such an assumption. This study will be reviewed in Section 7.1.1, where I will show how some of the extended meanings in *over* are obtained by the interaction of the semantic content of this preposition and the other co-occurring elements.

In the semantic field of sense perception – as pointed out in Chapter 2 –, some of the extended meanings are not just the result of a verb being polysemous, but the result of the semantics of the verb and that of its arguments. For instance, in a sentence like (3)

(3) I told you to *listen* to your mother

one of the mappings that takes place in the source domain of hearing verbs is between physical hearing and the meaning 'to heed', 'to pay attention'. In (3), the speaker is not only asking the hearer to pay attention to what his/her mother is saying, he/she is asked to follow and obey his/her mother's requests. In this example, the argument *to your mother* is helping to create this shift from the meaning 'to heed' to 'to obey'.

¹⁰⁸ Chapter 5 discusses what these properties are.

Another example can be (4).

(4) John hardly *touched* the food

The extended meaning in this case is ‘to partake of food’. In this case, not only the argument *the food* causes this meaning, but also the adjunct *hardly* emphasises the meaning ‘to partake’, that is to say that he did not eat very much¹⁰⁹. If we replace the argument *the food* by *the drink*, the meaning will not longer be ‘to partake of food’, but ‘to partake of drink’; and if we change it for any other one not related to food or drink, this meaning will not be inferred at all.

As neither Sweetser’s analysis nor other studies within Cognitive Linguistics provide an account for this kind of phenomenon, it might be useful to review an approach that focuses on how individual lexical items – when combined with others in phrases and clauses – can generate a larger set of word senses.

As introduced in 1.2.3, Pustejovsky’s (1995) Generative Lexicon is such a model. The Generative Lexicon is an approach to the study of multiple meaning that proposes a strong compositionality framework. In the following section, I take up this model in order to see whether it can solve some of the shortcomings found in Sweetser’s theory in respect of the role that the arguments play in the overall meaning of a sentence.

4.2. PUSTEJOVSKY’S GENERATIVE LEXICON

Pustejovsky’s (1995) Generative Lexicon proposes that, within the characterisation of the semantics of the lexical item – a verb in our case –, it is possible to include the information that the arguments of the verb imply, and therefore, to show how the overall meaning of the sentence is formed.

Pustejovsky postulates a generative framework for the composition of lexical meanings. He proposes a new way of viewing decomposition by looking at the generative or compositional aspects of Lexical Semantics, rather than decomposition into a specified number of primitives. He rejects ‘weak compositionality’ models,

¹⁰⁹ As argued in Ibarretxe-Antuñano (1999d), the meaning ‘to partake’ is not only dependent on the inclusion of the adverb *hardly*. This only supports or gives more emphasis to one of the intrinsic characteristics of the sense of touch, namely <briefness_{yes}>. This view is extended in the discussion in Chapter 7.

where compositionality is achieved by enumeration of senses, and the number of lexical senses (lexical listings) is proportional to the number of interpretations in the language. Instead, he introduces a ‘strong compositionality’ model, where, while still preserving Frege’s principle of compositionality, the number of lexical senses remains roughly constant relative to the space of possible interpretations in the language. In his model, Pustejovsky wants to provide a formal statement of language that is both expressive and flexible enough to capture the generative nature of lexical creativity and sense extension phenomena.

In this model, there are four levels of representation; that is, the semantics of a lexical item α is a structure of four components:

$$(5) \quad \alpha = \langle A, E, Q, I \rangle$$

Before this model is adapted to our data, a brief description of each component is provided.

(i)- ARGUMENT STRUCTURE (A): specification of number and type of logical arguments, and how they are realised syntactically. There are four types of arguments for lexical items:

-‘True arguments’ (ARG_n): syntactically realised parameters of the lexical item.

-‘Default arguments’ (D-ARG): parameters that participate in the logical expressions in the qualia, but not necessarily expressed syntactically.

-‘Shadow arguments’ (S-ARG): parameters that are semantically incorporated into the lexical item. They can be expressed only by operations of subtyping or discourse specification.

-‘True adjuncts’: parameters which modify the logical expression, but are part of the situational interpretation and are not tied to any particular lexical item’s semantic representation.

(ii)- EVENT STRUCTURE (E): definition of the event type of a lexical item and a phrase. Making use of the constructions introduced by van Benthem (1983) and Kamp (1979), Pustejovsky interprets an ‘extended event structure’ as a tuple $\langle E, \leq, <, \circ, \subseteq, * \rangle$, where E is the set of events, \leq is a partial order of *part-of*, $<$ is a strict partial order, \circ is overlap, \subseteq is inclusion and $*$ designates the ‘head’ of an event. He

argues that an event structure with structured subevents can be represented in an event structure tree, which represents the specific events and their types (E_n), together with the ordering restriction over these events (RESTR¹¹⁰).

(iii)- QUALIA STRUCTURE (Q): models of explanation. It provides the binding of the *A* and *E* parameters. The Qualia specifies four essential aspects of a word's meaning:

- 'Constitutive': the relation between an object and its constituent parts.
- 'Formal': that which distinguishes it within a larger domain.
- 'Telic': its purpose and function.
- 'Agentive': factors involved in its origin or 'bringing about'.

In the qualia roles it is very important to bear in mind that on the one hand, every category expresses a qualia structure, giving in this way a uniform semantic representation compositionally from all elements of a phrase; and on the other, that not all lexical items carry a value for each qualia role, allowing the specification or application of the qualia relative to particular semantic classes.

(iv)- LEXICAL INHERITANCE STRUCTURE (I): identification of how a lexical structure is related to other structures in the type lattice, and its contribution to the global organisation of a lexicon.

The argument, event and qualia types must conform to the well-formedness conditions that are defined by the type system and by the lexical inheritance structure when undergoing operations of semantic composition. These four levels are connected by means of generative devices, which provide the compositional interpretation of words in context. There are three main devices described in Pustejovsky (1995:61):

(i)-TYPE COERCION: where a lexical item or phrase is coerced to a semantic interpretation by a governing item in the phrase, without change of its syntactic type.

(ii)-SELECTIVE BINDING: where a lexical item or phrase operates specifically on the substructure of a phrase, without changing the overall type in the composition.

¹¹⁰ For a complete description of each restriction, see Pustejovsky (1995:67ff).

(iii)-CO-COMPOSITION: where multiple elements within a phrase behave as functors, generating new non-lexicalised senses for the words in composition. Here there are also included cases of underspecified semantic forms becoming contextually enriched, such as ‘manner co-composition’, ‘feature transcription’, and ‘light verb specification’.

With the definition of the functional behaviour of lexical items at these four different levels of representation, Pustejovsky tries to characterise the lexicon as an active and integral component in the composition of sentence meaning. Through different expressive mechanisms, this model aims to group different word senses into a single ‘meta-entry’ or, following Pustejovsky and Anick (1988) ‘lexical conceptual paradigms (lcps)’, which will encode regularities of word behaviour dependent on context. These ‘lcps’ will constrain what a possible word meaning can be through the mechanism of well-formed semantic expressions. Pustejovsky uses the lcps in order to account for that inherent ‘something’ in the semantics of nominals that makes them able to project any of the separate senses of the noun in distinct syntactic and semantic environments. He argues that lcps do not represent different senses but aspects of the same meta-entry. For example, in the case of *window* as a physical object and as an aperture, Pustejovsky represents them by means of a dotted type¹¹¹ of the form:

$$\frac{\alpha: \sigma_1 \quad \alpha: \sigma_2}{\text{lcp}(\alpha): \sigma_1 . \sigma_2} \quad \text{where} \quad \text{lcp} = \{\sigma_1 . \sigma_2, \sigma_1, \sigma_2\}$$

that is to say for the case of *window*:

$$\text{window_lcp} = \{\text{physobj} . \text{aperture}, \text{physobj}, \text{aperture}\}$$

Under Pustejovsky’s approach metaphorically extended meanings are not included as part of the language; these cases are explained pragmatically instead. Briscoe and Copestake (1991) try to incorporate this in their approach.

¹¹¹ A ‘dotted type’ is the logical type relation between the polysemous senses of a lexical item. (See Pustejovsky 1995: 93, for a more detailed description).

They argue that whereas other approaches postulate for a cognitive account of conceptual transfer (Lakoff and Johnson 1980) or for a general pragmatic account of the ‘cue-validity’ (Nunberg 1979), these phenomena can be accounted by rule-governed lexical processes, giving lexical licenses or rules which conventionalised and language specific aspects of these general conceptual transfers are expressed and which serve as language-specific filters on the general process.

4.2.1. DISCUSSION

One of the major drawbacks that Pustejovsky sees in previous compositional approaches is that these do not see the lexicon as an active and central component in the linguistic description, but either as active functors or passive arguments. In his Generative Lexicon, Pustejovsky argues that a core set of word senses is used to generate a larger set of word senses when individual lexical items are combined with others in phrases and clauses. For instance, in the case of verbs, the extensions of meaning are achieved by the combination of the verb with its arguments.

In Chapter 2, I presented a typology of both prototypical and non-prototypical meanings in sense perception verbs. In the case of the semantic field of touch, I proposed several extended meanings, some were still physical such as ‘to partake of food or drink’ and ‘to affect, physically’, and some of them were abstract or metaphorical as ‘to reach’ and ‘to affect, non-physically’. In this section, I offer a semantic characterisation of these meanings using Pustejovsky’s framework to see whether this framework is enough to explain how these semantic extensions are obtained.

One of the meanings proposed for the sense of touch is ‘to partake of food or drink’, as illustrated in (6):

(6) John hardly *touched* the food

ARGSTR = [ARG1 = 1 : human]
 [ARG2 = 2 : physobj (TELIC = eat)]
 [D-ARG= 3 : how]
 EVENTSTR = [E₁ = e₁, activity]
 QUALIA = [FORMAL = partake (e₁, 1, 2, 3)
 [AGENTIVE = touch_act (e₁, 1, 2)

The verb *touch* in (6) is associated with three arguments: two TRUE ARGUMENTS (the subject ARG1 and the object ARG2) and a DEFAULT ARGUMENT, each argument is given a boxed number, called ‘tags’ (Pollard and Sag 1994), that indicate how the information is shared between these arguments and the qualia. The verb is analysed as an activity, as shown in the EVENT STRUCTURE. Both the ARGSTR and the EVENTSTR are bound by the QUALIA. The activity is identified as that AGENTIVE act of ‘touching’ involving the subject ARG1 and the object ARG2. The FORMAL role expresses the activity of there being such an object ARG2, whose role and function is expressed by its TELIC quale, and a D-ARG that tells us about the manner in which the activity was performed. As the ARG2 in this case is *the food*, the meaning that I have represented is ‘to partake of food’; however, if we change this ARG2 for another one like *the drink*, the meaning would be ‘to partake of drink’ instead.

It seems that Pustejovsky’s analysis accounts for this example quite neatly, as we can see how every member of the sentence contributes to the overall meaning of the sentence.

Example (7) is more complicated. There are two possible interpretations: one is the prototypical meaning of *touch* as an activity verb, and the other is the extended physical meaning of ‘to affect’. The characterisation of (7) is as follows:

(7) John *touched* my clothes

ARGSTR = [ARG1 = $\boxed{1}$: human]
 [ARG2 = $\boxed{2}$: phyobj]

EVENTSTR = (a) [E₁ = e₁: activity]
 (b) [E₁ = e₁: activity]
 [E₂ = e₂: result]

RESTR = $\langle \alpha$

QUALIA = [FORMAL = affected (e₂, $\boxed{2}$) (Only in (b))]
 [AGENTIVE = touch_act (e₁, $\boxed{1}$, $\boxed{2}$) ($\boxed{2}$ not in (b)).

In this example, the verb *touch* has two TRUE ARGUMENTS: the subject ARG1 and the object ARG2. The EVENTSTR in (7) is more complicated than that

in the previous example, as there are two options. Option (a)¹¹² corresponds to the first interpretation, i.e. prototypical activity meaning. In (a), the verb is taken as an activity in the EVENTSTR, which also results in an AGENTIVE quale that involves the subject ARG1 and the object ARG2. Option (b) corresponds to the second interpretation, where there is not only a contact between the subject and the object, but also an effect on the object, a change of place, position in this case. In (b) then, the verb is analysed as an accomplishment, containing two subevents, an activity (e_1) and a result (e_2). The order in which these subevents occur is restricted by the relation of ‘exhaustive ordered part of’ represented by $<_{\alpha}$, where e_1 and e_2 are temporally ordered such that the first (e_1) precedes (e_2), each is a logical part of the event and there is no other event that is part of it (see Pustejovsky 1995: 69). In this case, the AGENTIVE act of ‘touching’ involves only the subject ARG1. This AGENTIVE role is bound to e_1 (activity). The FORMAL quale expresses the result of that activity, e_2 , and the object ARG2, which has been affected by such an activity upon which the result has been inferred.

Although in (7), there are two possible interpretations inferred, it is possible to account for both using Pustejovsky’s framework. The disambiguation is carried out by a different characterisation of the EVENTSTR (Options (a) and (b)).

A problematic example, however, is (8) where two unpredictable interpretations are simultaneously inferred.

(8) John *touched* Mary

ARGSTR = [ARG1 = $\boxed{1}$: human]
 [ARG2 = $\boxed{2}$: human]

EVENTSTR = (a) [$E_1 = e_1$: state]
 (b) [$E_1 = e_1$: activity]
 (c) [$E_1 = e_1$: activity]
 [$E_2 = e_2$: result]
 RESTR = $<_{\alpha}$

QUALIA = [FORMAL = affected (e_2 , $\boxed{2}$) (Only in (c))]
 [AGENTIVE = touch_act (e_1 , $\boxed{1}$, $\boxed{2}$) ($\boxed{2}$ not in (c)).

¹¹² The possibility of having several different options in the EVENTSTR is my modification of Pustejovsky’s model.

In this example, the verb *touch* has only two TRUE ARGUMENTS: the subject ARG1 and the object ARG2. The EVENTSTR in (8) is more complicated than that in the previous example, as there are three options. In (a), the verb is understood as a state, in which case, the AGENTIVE act involves the subject ARG1 and the object ARG2. This interpretation can be paraphrased as John being next to Mary. Options (b) and (c) are explained in the same way, as (a) and (b) in the previous example (7). In (b), the verb is taken as an activity in the EVENTSTR, which also results into an AGENTIVE quale that involves the subject ARG1 and the object ARG2. This option is the prototypical activity meaning of *touch*, where only contact is implied. And in (c), the verb is analysed as an accomplishment, containing two subevents, an activity (e_1) and a result (e_2), also restricted by the relation of ‘exhaustive ordered part of’ represented by $<_{\alpha}$. Again in (c), John does not only have some physical contact with Mary, but he causes an effect on her.

However, in (8) there is an added difficulty. In this example it is not possible to characterise using Pustejovsky’s model, the difference in meaning when we are referring to the physical or to the abstract/metaphorical touching. This ambiguity is not present if the EVENTSTR is (a), namely when E_1 is a state and it is understood that John is adjacent to Mary; but in those cases when the EVENTSTR is either (b), i.e. John can touch Mary physically or metaphorically, or (c) i.e. John can affect her, physically (making her shiver for instance) or metaphorically (feelings). The semantic characterisation for both arguments and the verb *touch* under this model is the same either if the reading is physical or abstract; however, it is very clear that they are two different interpretations that must be accounted for separately. Unfortunately, this model does not seem to have a solution for either explaining how these two meanings are inferred or solving this ambiguity by means of semantic characterisations. It could be argued that the possible metaphorical readings could be listed somewhere in the QUALIA, but it is not clear how this would work in cases like (c), where the same arguments and event type produce two unpredictable interpretations.

If we look at other metaphorical meanings in this sense, for instance the meaning ‘to reach’ illustrated in (9), the same problem seems to be present.

(9) John *touched* the highest point in his career

For example, ‘to reach’ in (9) can be represented as follows:

ARGSTR = [ARG1 = $\boxed{1}$: human]
 [ARG2 = $\boxed{2}$: obj $\boxed{4}$: phys or non-phys (TELIC: location)]
 [D-ARG= $\boxed{3}$: where]
 EVENTSTR = [E₁ = e₁: activity, $\boxed{4}$: phys or non-phys]
 QUALIA = [FORMAL = reach (e₁, $\boxed{1}$, $\boxed{2}$, $\boxed{3}$)]
 [AGENTIVE = touch_act (e₁, $\boxed{1}$, $\boxed{2}$)]

In this case, there are also two TRUE ARGUMENTS and a DEFAULT ARGUMENT. The verb is analysed as an activity in the EVENTSTR. The activity is identified as an act of ‘touching’ involving the subject ARG1 and the object ARG2. The word *point* fills in ARG2 in this example and we know by the information provided in the TELIC quale, that the function of this ARG2 is to give reference to a location. The problem in this example is twofold. On the one hand, we see that although the FORMAL quale is ‘reach’, it does not seem to be very clear how this meaning is derived from the interaction between the QUALIA and the members of the ARGSTR. The other problem is that in this case, *point* does not refer to a physical point, but to an imaginary one. The point that John has reached is a level in his career. This problem is solved by specifying in the ARG2 that the object can be either physical or non-physical (phys or non-phys). This information is bounded to the EVENTSTR in a way that, whenever the object in ARG2 is physical then, the activity referred to is also physical, and whenever the object selected in ARG2 is non-physical, then the activity in the EVENTSTR is also non-physical. By adding this information to the description of the ARG2, it seems that we can account for the metaphorical meaning of (9).

However, in an example like (10), where the meaning inferred is ‘to deal with’, we do not need to specify whether ARG2 is physical or non-physical, as the ARG2 is a concept, i.e. non-physical entity.

(10) John *touched* on the topic

ARGSTR = [ARG1 = 1 : human]
 [ARG2 = 2 : concept (CONST = abstract/count)]
 [D-ARG = 3 : where]
 EVENTSTR = [E₁ = e₁: activity]
 QUALIA = [FORMAL = dealt with (e₁, 1, 2, 3)]
 [AGENTIVE = touch_act (e₁, 1, 2)]

In this example the FORMAL quale is ‘dealt with’. However, as pointed out in the previous examples how this meaning is obtained is not absolutely clear. It could be argued that the fact that ARG2 is a concept might result in this reading as ‘deal with’. However, the fact that ARG2 is a concept does not seem to explain this meaning. As we can see in (11), ARG2 is also characterised as a concept, but the sentence is not felicitous.

(11) *Mary *touched* the joke

ARGSTR = [ARG1 = 1 : human]
 [ARG2 = 2 : concept (CONST = abstract/count)]
 EVENTSTR = [E₁ = e₁: activity]
 QUALIA = [AGENTIVE = touch_act (e₁, 1, 2)]

To sum up, we see that it is possible to account for some metaphorical meanings under Pustejovsky’s approach, either by adding more information in the ARG2, physical or non-physical as in (9) or by specifying that the ARG2 is a concept as in (10). However, it seems that this model is unable to explain how and why restrictions occur; that is to say why (10) is acceptable, but (11) is infelicitous.

As will be explained in more detail in Chapter 7, the reason why this example is not felicitous lies in the fact that ARG2 is not a ‘touchable’ type of concept, i.e. a joke cannot be touched in any abstract possible way as a topic is in the previous example. From a Cognitive Linguistics point of view, the fact that *the joke* is not licensed with the verb *touch* stems from the way we experience this sense in our lives, in the human embodiment of this sense (Johnson 1987).

In other words, the bodily basis of the tactile sense, which I will characterise in terms of properties in the following chapter, clashes with the way in which we seem to understand and experience a joke. In order for this sentence to be felicitous,

the properties of the ARG2 are required to preserve the properties that characterise the sense of touch.

This requirement, that I call ‘verb property requirement’ (see Chapter 7), seems to be acknowledged by Pustejovsky in the example when he discusses *read* and *book*. In order for the representation of *reading* to be considered well-formed, it is necessary to have a complement not only containing information but also being propositional, i.e. a complement that is ‘readable’. Pustejovsky solves this requirement by making reference to the dotted argument *x.y* in the qualia, apart from the FORMAL definition of the relation between arguments (1995: 96). I will propose, however, that this requirement should be present in all cases, even in those examples where the semantic content of the arguments is more important in the extension of meaning than that of the verb itself (cf. ‘to partake of food or drink’).

4.3. CONCLUSIONS

In this chapter, I have revised a cognitive semantic approach to the study of polysemy and semantic change: Sweetser’s MIND-AS-BODY metaphor. This author claims that the paths of semantic change are unidirectional, from a concrete domain to an abstract domain. In the case of English perception verbs, the mappings take place between the vocabulary of physical perception and the vocabulary of the internal self and sensations. These mappings, which appear to be cross-linguistic, are not random, but well structured by means of metaphor.

Based on the data analysed in Chapter 2, I have concluded that as suggested by Sweetser, the mappings between these two different domains of experience are not particular to English, but to other languages such as Basque and Spanish. It is also argued that the metaphorical scope of sense perception verbs is much larger than that proposed by Sweetser. In fact, meanings do not only extend to more abstract domains, but also within the physical domain.

It has been pointed out that under this theory, such physical extended meanings cannot be accounted for. Another shortcoming of this approach is the fact that it does not give an explanation for the reasons why a particular source domain is mapped onto a particular target domain. This model does not show exactly what ‘used’ part of the source domain is mapped onto the target domain.

These points are further discussed in Chapter 6, where a process called ‘Property Selection’ is introduced as a possible way of solving these problems.

Finally, the last point not addressed in this theory is the analysis of the semantics of the other elements in the sentence and their impact in the overall meaning. That is to say, the question whether the different senses of a lexical item are the result of the different senses of a polysemous verb through the interaction between the semantics of the verb and its arguments; or whether it is the choice of a particular argument what really determines different meanings.

As a possible solution for this last point, I have applied Pustejovsky’s Generative Lexicon to the analysis of some examples drawn from the data analysed in Chapter 2. I have concluded that this model works very neatly for those physical extensions of meaning, but in the case of metaphorical senses, it does not seem to be able to constrain what instances are felicitous and what are not. The discussion of this issue and a possible solution are presented in Chapter 7.

The objective of this thesis is to propose a hypothesis that can account for the reasons why and the way in which the polysemy in perception verbs occurs. The framework that I will propose in the following chapters is based on the advantages that both Sweetser – and Cognitive Linguistics – and Pustejovsky’s frameworks have. The advantages of Sweetser’s approach are the use of metaphor as the structuring cognitive device for abstract extended meanings, the theoretical tenet of embodiment, i.e. the fact that the bodily basis of these senses motivates these semantic extensions. The advantage in Pustejovsky’s model is the idea that meaning is generatively compositional¹¹³, i.e. the interpretation of the verb is influenced by the semantics of its arguments.

¹¹³ I would like to point out that one does not need to comply with a generative view of language, as Pustejovsky does, in order to accept a degree of compositionality in meaning (see Langacker’s work on cognitive grammar and the notions of ‘constructional schema’ (1991b: 15-19). What I see as an advantage of this model is the way in which Pustejovsky shows how some meanings are obtained by means of the semantic content of the words that integrate the sentence, not Pustejovsky’s generative framework.

The main contribution to the study of polysemy in this thesis will be to fill in the gaps left unanswered by both models. The gaps in Sweetser's model are the lack of explanation for physical extended meanings; the lack of a description for the bodily basis of perception verbs, and consequently, the impossibility to show how this bodily basis constrains both the creation of extended meanings, and the devices that structure them, i.e. metaphor. The gap in Pustejovsky's model is the lack of a constraint that could establish what elements can or cannot co-occur with what elements in the same sentence.

In the following chapter, I will start with the description of the bodily basis of perception verbs. As pointed out in this discussion, this description is central to the study of polysemy, because it will provide the tools necessary to constrain not only the devices used to create extended meanings (Chapter 6), but also what elements can take part in the creation of such meanings (Chapter 7).

CHAPTER 5: PERCEPTION, THE SENSES AND OUR LANGUAGE.

One of the main tenets of Cognitive Linguistics is the idea of embodiment, i.e. how meaning is grounded in the nature of our bodies and perception, in our interaction with the physical, social, and cultural environment that surrounds us. Concepts are grounded in our bodily experience and then elaborated by structures of imagination, i.e. metaphor. This implies that if we are able to characterise the domain of experience that constitutes the source domain it will be possible to explain the semantic extensions that occur in the corresponding target domain. In other words, the reason why it is possible to use these verbs of perception to express other meanings – apart from the physical sense perception – must lie in the way we perceive and experience the senses.

In this chapter, I will establish what the bodily basis of perception verbs is. Section 5.1 describes how human perception works. In Section 5.2 the relation of the main properties that describe the process of perception through the five senses is presented. Section 5.3 states the differences between these properties and semantic features in Componential Analysis. Finally, some conclusions are drawn in Section 5.4.

5.1. PERCEPTION AND THE SENSES

According to Sekuler and Blake (1994), perception is a biological process wherein the brain derives descriptions of objects and events in the world, using information gathered by the senses. Thus, the traditional five¹¹⁴ senses – vision, hearing, touch, smell and taste – have been described as “channels for information about the world” (Sekuler and Blake 1994), and as “different modalities for conveying information about the physical world” (Classen 1993: 4). There are two

¹¹⁴ There has not always been agreement on the number of senses. Based on the intrinsic relationship between the senses and the elements – earth, air, fire, water, and the quintessence – Aristotle, in *De Anima* (c. 320 BC), was the first one to group them into five. This classification, however, has been questioned throughout Western history by various philosophers (see Vinge 1975) and, more recently, by sensory scientists (see Wolfe 1988:xi-xii).

key words in these definitions: **information** and **different**. The five senses give us information about the world we live in, but the way this information is perceived, processed, and understood by human beings is different. These differences are based on biological and cultural constraints. Biologically, each sense has its own receptors – eyes, ears, skin, nose, mouth – and its own pathways to the brain. Each sense receptor responds to different stimuli: light, sound waves, mechanical disturbances, volatile substances, and soluble substances. Culturally, human beings rely more on some senses than on others. For Western societies, vision is the most reliable sense. This supremacy of sight over the other senses finds its origin at the Enlightenment, when philosophers such as Locke and Descartes regarded sight as the sense of science. However, in earlier periods of Western history, as well as in other contemporary cultures, senses such as smell, touch, and hearing are considered important in making sense of the world¹¹⁵. For instance, Classen *et al.* (1994: ch. 3) report on the Ongee of the Andaman Islands in the South Pacific, whose lives are ordered by smell. For the Tzotzil of Mexico, reported in Classen (1993: ch. 6) heat (hence touch) constitutes the basic force of the cosmos. Yet for Australian aborigines hearing is more salient than any other sense (Evans and Wilkins 1998).

There are three main elements in perception: the person that carries out the perception or perceiver (PR), the object – animate or inanimate – being perceived (OP) and the act of perception itself (P). It is to a description of these elements that we turn now.

5.1.1. PHYSIOLOGY OF THE SENSES

A complete understanding of how human perception works must include descriptions of the three elements (PR, OP, P) mentioned above. It is necessary to understand which parts of our body and brain are involved in the perceptual process, and how these organs work. The reason for this is that the function and limitations of these systems shape and constrain our perceptual processes, the way in which we experience the world. As we have said before, our experience and understanding of the world motivates our conceptual categories, the meaning of words. Therefore, as

¹¹⁵ See Howes (1991) for a collection of papers devoted to the anthropology of the senses in different cultures. Ackerman (1990) is also an exploration of the origin and evolution of the senses, as

we shall see in Chapter 6, our perceptual system must also constrain and affect the way we conceptualise and use our sense-related language. This is also constrained by the way we – as human beings – perceive perception, that is to say how we think and how we experience the act of perception itself.

A full detailed description of human perceptual systems lies outside the scope of this thesis¹¹⁶. In the following subsections, however, I will include a brief description of the physiology of each sense, together with a brief discussion of our ‘perception of perception’. These will be extended in Section 5.2, when the properties defining these senses are introduced. As shown in the analysis, these two constraints – sense physiology and our perception – do not always coincide. The way we think we perceive with these senses sometimes does not correspond to the way in which the physiological processes take place.

5.1.1.1. Vision

The eyes are the first element in the visual system. Eyes capture light – stimulus for vision – and generate messages about it. The human eye consists of three concentric layers: the fibrous tunic (outermost layer), the vascular tunic (middle layer), and the retina. The function of the outermost layer, the fibrous tunic, is to protect the eyeball. It consists of the sclera (white part) and the cornea (transparent). The function of the middle layer is to nourish the eyeball. It consists of the choroid, a dark pigment that nourishes the retina, and the ciliary body, the structure that contains the aqueous humor that fills the anterior chamber. The ciliary body gives rise to the iris, a circular patch of tissue that gives the eye its characteristic colour. In the middle of the iris lies the pupil, an opening within two sets of muscles. These muscles allow the change of the size of the pupil, which in turn controls the amount of light reaching the back of the eye. Behind the iris, there is an optical element of the eye, the crystalline lens. The lens must be transparent to provide a good vision; an opacity or reduced transparency of the lens – known as cataracts – would cause a deficient visual perception or even blindness.

well as their variation across cultures.

¹¹⁶ For a full description of the perceptual systems and processes, see Gibson (1966), Harper (1972), Held (1988), Maelicke (1990), Sekuler and Blake (1994), Wolfe (1988), among others.

The lens is composed of three components: the elastic capsule, the epithelial layers and the lens itself. The main function of the capsule is to mould the shape of the lens, thus focusing sharply near or distant objects upon the retina. This process is called ‘accommodation’ (Harper 1972: 115; Sekuler and Blake 1993: 38). Finally, between the lens and the next layer, the retina, there is the vitreous chamber.

The retina is the neural tissue at the back of the eye. Some landmarks can be identified in the retina: the macula, in whose centre lies the fovea, the part stimulated by an object in the direct line of sight; the optic disks, where nerve fibres exit the retina carrying information to the brain; and the pigment epithelium.

As we have said before, the physical stimulus for vision is light. The visual system can respond to a very large range of stimulus intensities. Light brings information about the objects in the environment (Gibson 1966). However, in order for light to provide information, there are some requirements to be fulfilled (Sekuler and Blake 1994: 44):

(i) Light must be sufficiently intense to penetrate the eyes, reaching the photosensitive material in the retina.

(ii) The distribution of light must be properly focused.

(iii) The pattern of light falling on the retina must preserve the spatial structure of the object from which it is reflected; otherwise, it will not be useful as a source of information about the structure and layout of objects.

The incoming light must pass through a complex of neural elements before reaching the photoreceptors in the macula, which are actually responsible for converting light into neural signals. There are two types of photoreceptors: cones, which work in daylight; and rods, which work in dim illumination. These photoreceptors transform the so-called retinal image – the pattern of light distribution reaching the retina – into a neural image. This neural image passes onto a network of diverse cells called collector cells. These cells integrate all the information from groups of neighbouring photoreceptors. The output from the network of collector cells provides the input to the retinal ganglion cells. Due to the centre / surround organisation of their receptive fields, their main task is to detect differences in light level or contrast. These differences, as discussed below, are reflected in language.

The axons of the ganglion cells form the optic nerve that provides all the input data for the neural processing of visual information within the brain. The optic nerves from both eyes converge at the optic chiasm. The optic nerve from each eye branches into two segments – one crossed, where fibres cross to the opposite side of the brain; the other uncrossed, where fibres do not change sides. Within the chiasm, crossed fibres from one eye join with uncrossed fibres from the other eye. These new combinations are called optic tracts. Most of these fibres are projected to a cluster of cell bodies called the lateral geniculate nucleus (LGN); and the remaining to areas of the midbrain, such as the superior colliculus. This is designed to guide orienting movements of the eyes and head towards detected objects. This ability to orientate the eyes towards the object is reflected in the language in expressions such as *point of view* and will be represented later in the analysis under the property <location>. The colliculus is also prepared for detecting objects located away from the point of fixation (Sparks 1988). That is why vision, together with hearing, are called the far distance senses: There is no need for the object perceived to be close to the eye¹¹⁷. The LGN has two distinct populations of neurones – magnocellular and parvocellular cells. The output from these cells is sent to the visual cortex in the occipital lobe, the major visual centre. The visual cortex is composed of cortical cells that respond to stimulation of a restricted area of the retina. These cells register information about orientation, direction of motion, binocularity and colour.

In sum, vision provides us with information about the shape, size, orientation, colour, distance and motion of the OP. In Western society, vision is considered as the most reliable sense, as the sense that offers the most accurate information about the world outside.

It is important to notice how the physiology of perception and our perception of perception is sometimes different. As noticed before, vision is believed to be a distant sense. That is to say, we do not need to have contact with what we see. Therefore, despite the fact that human beings perceive vision as an external sense the physical stimulus for vision – light – must penetrate the eyes to be transformed into neural elements. In fact, during the Enlightenment, philosophers saw in this

¹¹⁷ This is represented by the property <closeness_{no}> in Section 5.2.2.

detachment from the eyes and the OP the basis for the ‘objectivity’ of vision, and hence, the basis for the scientific value of this sense. Properties <contact_{no}> and <internal_{no}> in Section 5.2.2 reflect this fact.

Analogies between the physiology of vision and metaphorical expressions in language are very obvious. For instance, the fact that the eyes are the most important element in the visual system is reflected in expressions like *I couldn't believe it until I saw it with my own eyes*, to ascertain the visual taking-in of an authentic situation or phenomenon (Alm-Arvius 1993: 33; Lipinska-Grzegorek 1977: 4). The eyes are not only the first element in visual perception. They are perceived as the way to penetrate the human mind. The eyes are considered as reflecting our real thoughts. That is why there are expressions such as *I couldn't see any hint of remorse in his eyes*.

In the description of the lens, it has been mentioned how it must be transparent in order to see properly. Opacity in the lens is known as cataracts. Similar analogies with these cataractous lens that damage vision are found in language too, in sentences like (1):

- (1) His greed / hate didn't let him *see* the truth.

In this sentence there is an analogy between the defective lens¹¹⁸ and the greed / hate. In both cases they do not let the person see the reality, either physical (the objects around) or metaphorical (the truth).

Another characteristic of the lens reflected in language is the ability to focus near or distant objects. This process of ‘accommodation’ can be seen in expressions like *to be out of focus*, *to get something into focus*, *to come into focus* and so on.

There are also similarities between the physical stimulus for vision – light – and some metaphors in languages. In respect to the first condition mentioned above – intensity in light source –, expressions like (2) – (6) are found in English (Danesi 1990: 223).

- (2) That was a *brilliant* idea

¹¹⁸ It could be argued that to think that the cataracts constitute the experiential basis for (1) is a bit far-fetched, especially if we take into account that this kind of semantic extensions may have arisen before sophisticated knowledge of human physiology (Barcelona p.c.). Perhaps the source for this type of metaphor comes from the experience of putting an opaque object in front of our eyes. This object could be external as well as internal (cataracts or any cause of blindness).

- (3) I take a *dim view* of that whole affair
- (4) What you are saying is not very *clear*
- (5) That is a *transparent* argument
- (6) Can you *elucidate* your idea?

In these examples, a different meaning is inferred depending on the intensity of the visual stimulus. *Dim view* in (3) implies that this person has a poor understanding of the affair in question. This is a metaphorical use of *dim light*, which refers to a poor or weak light. The opposite case is found in (2), where *brilliant* means ‘splendid, intelligent’. Again this is a metaphorical use of the adjective *brilliant* that refers to shine, brightness¹¹⁹. In other words, the intensity of the light that our eyes perceive does seem to have an influence on our metaphors. If the intensity of the light is not enough, we perceive things as negative, weak. If the intensity of the light is strong, we perceive things as positive, good. That is why we can utter expressions such as (2) to (6) above, and solve problems by giving them some ‘light’ as in (7).

- (7) Her speech *threw light* on the matter (Danesi 1990: 223)

5.1.1.2. Hearing

The stimulus for hearing consists of sound waves, which are captured by the ears. Our perception of hearing corresponds to the physiological process of these sound waves coming inside our ears. This is represented by the property <internal_{yes}> in Section 5.2.2. These sound waves are then transformed into neural events by the hair cells and analysed by neurones specialised for frequency and sound location. In hearing, as in vision, it is possible to locate the source and direction of stimulus, where sounds are coming from, even if the object that emits the sound is far away from us, and even if we cannot perceive with our eyes, we can still hear it. Properties <location_{yes}> and <closeness_{no}> in Section 5.2.2 represent these facts.

¹¹⁹ Etymologically, the original sense of this word (< F *brilliant*, pres. part. OFr *briller* ‘sparkle’) was to sparkle as a beryl.

The ear is divided into three parts: the outer ear, the middle ear, and the inner ear. The outer ear consists of the pinnae, the auditory channel and the eardrum. The pinnae act like reflecting surfaces that modify the complexity of sound entering the ear (Batteau 1967). After the sound is collected by each pinna, it is channelled down the auditory canal. At the end, sound pressure comes in contact with the eardrum, an oval membrane that vibrates when sound pressure waves strike it. Both the pinnae and the eardrum are like a directional microphone. The eardrum forms the outer wall of the middle ear. In this small chamber, the vibrations in the eardrum are transferred to the oval window by three small bones called the ossicles. The main function of the middle ear is to “serve as an impedance matching device and as a circuit overload protector” (Sekuler and Blake 1994: 304). The next part is the inner ear, where mechanical vibrations are converted into electrical nerve impulses to be carried to the brain. The inner ear consists of two series of hollow cavities carved into the temporal bone of the skull: the semicircular canals, which are concerned with the maintenance of bodily posture and balance, and the cochlea, which contains specialised receptors – hair cells – that place us in contact with our environment. These pressure changes stimulate the receptor cells in the cochlea. The vibration of the oval window causes pressure changes in the fluid that fills the cochlea. These pressure changes cause movement in the hair cells, thus providing the stimulus for their activity. The cochlea transforms sound energy (pressure waves) into neural information, which is carried out of the inner ear by the auditory nerve. This auditory nerve branches into several different pathways that reconverge within the auditory cortex. The different pathways seem to process different aspects of auditory information for locating and identifying sound sources in the auditory environment (Evans 1974). Vision and smell too perceive information by ‘double’ paths and ‘double’ organs. As was discussed in the previous section, in vision, fibres branching from the optic nerve of each eye are projected onto the LGN. In smell, both cavities in the nose seem to work in alternative cycles. The only difference between hearing on the one hand and vision and smell on the other is that the PR is not aware of this fact in the case of vision and smell, only in hearing.

Our perception of the ear both as a cavity where sounds can get in and also can get out and as a ‘double’ organ where information is received from two distinct

sources is shown in language in expressions such as *in one ear and out of the other*. An ear is not only a place where sounds can get through, they are also containers for those sounds, as expressions such as *earful* attest.

5.1.1.3. Touch

The stimulus for touch consists of mechanical disturbances of the skin when in contact with a different object. The main characteristic of this sense perceived by the PR is in fact the contact that exists between the PR and OP¹²⁰. This characteristic comes under the property <contact_{yes}> in the following section.

These mechanical disturbances, even the smallest ones, are registered by several different kinds of specialised ‘mechanoreceptors’ situated in various layers of the skin. In the following section, the fact that even a minimal disturbance stimulates the sense of touch is represented by the property <briefness_{yes}>. These mechanoreceptors are sensitive to mechanical pressure or deformation of the skin. Afferent fibres from these mechanoreceptors carry neural impulses caused by tactile stimulation into the dorsal side of the spinal cord. Inside the spinal cord, these afferents make synaptic contact with two major classes of neurones: interneurones and those constituting the lemniscal pathway. A circuit composed of interneurones, motor neurones and afferents mediates reflex reactions. Interneurones synapse onto motor neurones, whose axons go out the spinal cord and travel to muscles near the body area where the afferents originated. The other class of spinal cord neurones in the lemniscal pathway carries information to particular regions in the brain stem. Information about pain and temperature is carried to the brain by a different pathway, the spinothalamic tract. Within the brain, touch information is processed in various specialised cortical regions that contain maps of the surface of the body. Touch information is received and processed by the somatosensory cortex. This cortical region is subdivided into two major parts: S-I (first somatosensory area) and S-II (second somatosensory area). Both receive input from the thalamus, but S-II seems to receive information from S-I as well.

¹²⁰ This can be seen in many metaphorical expressions in language; for instance, *keep in touch*, *to loose touch with reality*.

Unlike other senses, touch sensations can arise from stimulation anywhere on the body's surface. The hand is, however, usually the most common organ of stimulation. It is important to notice that tactile perception is always superficial and thus, the PR can in this way obtain information about the temperature, shape, size, and surface of the OP. By touching an object, the PR can tell what the limits of the OP are. These two characteristics are represented by the properties <internal_{no}> and <limits_{yes}> respectively, in Section 5.2.

5.1.1.4. Smell

The stimulus for smell consists of volatile molecules or vapours, which reach the olfactory cavity either through the nostrils or through the mouth. This is represented by the property <internal_{yes}> in the following section. Although these molecules are in contact with our noses, it is interesting to notice that PRs do not perceive the sense of smell as one that requires contact. In fact, the sense of smell has been classified – together with hearing – as a non-contact sense, because it “often signal[s] the presence of something at a distance from the perceiver” (Viberg 1984: 148). This is represented by the property <contact_{no}> in the following section.

These odour molecules are contained in the air that we need to inhale in order to breathe; as a result we smell all the time, without being conscious of it all the time. This is represented by the property <voluntary_{no}> in Section 5.2.

Although odour perception is not as accurate as that of the other senses and rather dull if compared with that of other species such as the dog (Moulton 1976), the human nose is very sensitive. It is capable of detecting odours as faint as ethyl mercaptan in concentrations as minute as 1 part per 50 billion parts of air (Sekuler and Blake 1994: 426). Despite this ability to detect odours, the identification and naming of the odour itself is difficult. This difficulty is termed the ‘tip of the nose’ phenomenon by some researchers (Lawless and Engen 1977). Later in the analysis, these two characteristics are represented by the properties <detection_{yes}> and <identification_{no}>.

Odour sensitivity varies a great deal from odour to odour; it depends on other factors such as age and gender of the PR, the concentration level of odorous molecules, and the distance between the PR and the object that emits the odour

(Sekuler and Blake 1994). The closer the PR is to the source of odour, the stronger the perception of the odour is, and therefore, the easier its detection. This characteristic is represented by the property <closeness_{yes}> in Section 5.2.

The two nostrils work in alternating turns, a phenomenon called ‘nasal cycle’, which seems to correspond to an increase in brain activity in the hemisphere contralateral to the dominant nostril (Werntz *et al.* 1987). The olfactory receptor cells sit on the olfactory epithelium in the nasal cavity. These cells, between 6 and 10 million in the human nose, are different from other sensory cells such as photoreceptors, and hair cells. On the one hand, they all have the paraphernalia of neurones (cell bodies, short dendrites, and long axons); as a consequence, they are able to carry out two different tasks: to transform chemical stimulation into neural impulses and to carry those impulses directly to the brain. On the other hand, olfactory neurones are capable of reproducing; olfactory cells live for about 5 to 8 weeks, and when they die they are replaced by new ones (Graziadei and Monti Graziadei, 1988). Each olfactory cell has minuscule filaments, called cilia, extending from the olfactory knobs. These cilia extend beyond the surface of the epithelium, into the watery mucus that bathes the epithelium. The proteins contained in the cilia – the olfactory binding proteins – comprise the actual molecular receptors that grasp for fragrance molecules or portions of them. Each of the sensory nerves has a long filament, the axon, on the end opposite to the olfactory knob. This axon connects with other nerve cells in the brain. The information about the odour pattern is conveyed from the olfactory bulbs to other regions of the brain, such as the hypothalamus and other limbic system structures. Here it is processed in order to coordinate and manage our abilities to learn, to remember, to think, to respond, and to contemplate. The limbic system plays an important role in emotional reactions (Sekuler and Blake 1994: 444) and this may be a reason that explains why smells (and tastes) vary greatly from person to person. The property <subjective_{yes}> in Section 5.2.2 reflects this possibility.

Smell is nature’s oldest and most primitive sense (see Olfactory Research Fund 1996). When scattered cells that lived in water first inhabited the world, the only sense that was available to them was ‘smell’, on which they depended to detect chemicals. As animals evolved, so did the nervous system, which developed a smell

brain that helped to locate food, identify mates and detect enemies. Our sense of smell still uses similar regions of the brain as in the beginning, as the limbic system, although this has expanded its duties too to become responsible for our emotions, sexuality, memory and creativity.

5.1.1.5. Taste

The stimulus for taste consists of substances that penetrate into the taste buds in the tongue and mouth. This is reflected in the property <internal_{yes}> in Section 5.2.2. In order to taste the mouth has to be in contact with the OP, but tasting can be considered a voluntary act, because it is the PR's decision to actually put the OP that contains these substances into the mouth. These two characteristics are represented by the properties <contact_{yes}> and <voluntary_{yes}> in Section 5.2.2. These substances must be soluble in saliva in order to be tasted. The taste buds are the responsible receptor cells for the reception of chemical substances. Some of them are situated in the papillae, the little bumps in the tongue, in the roof of the mouth, inside the cheeks, and in the throat. The most sensitive part, however, is the tip of the tongue; this can identify tastes in only a couple of seconds. The property <briefness_{yes}> in Section 5.2.2 reflects this fact. The number of taste buds varies across individuals (Miller and Reedy 1990) and they are in a constant process of degeneration and replacement by new ones (Beidler and Smallman 1965). Each bud contains an average of fifty individual taste receptor cells. Each of these cells has a threadlike structure called a microvillus at their end. When these microvilli come into contact with taste solutions, an electrical potential is triggered in the receptor cell. Back inside the papilla, the taste receptor cells make contact with nerve fibres innervating the tongue, as they themselves do not have the axons to send messages to the brain. Taste buds in the tongue and mouth are innervated by no less than three distinct cranial nerves, sometimes even more than one nerve innervates the same taste bud (Keverne 1982); as a consequence, taste information arrives at the brain over several different communication lines. In the brain, there are two sections involved: on the one hand, the insular cortex – located between the temporal and parietal lobes – whose activity triggers the conscious experience of tastes; and on the other, part of the limbic system, which registers some behaviourally relevant information about

taste. As seen in the case of smell, this is a possible explanation for the differences in the aesthetic judgements of the PRs in reference to the classification of tastes, both physically and metaphorically. This is represented by the property <subjective_{yes}> in Section 5.2.2.

5.1.2. SUMMARY

In this section, the physiology of the five senses and the way we perceive them have been described. It has been shown how these two elements constrain and influence the way in which we create and use sense-related expressions. For example, it has been seen how the intensity of light – vision stimulus – has analogies in language expressions such as *dim view* and *brilliant idea*. How the poor identification process in smell is linked to the inherently weakness in the verbal description of odours.

These two constraints, however, do not always coincide; in other words, our perception of the senses is not always in accordance with the physiological description of the senses themselves. For instance, although vision, hearing and smell have ‘double’ organs that perceive individually, it is only in the case of hearing that PRs are aware of it, and as a consequence we have expressions such as *in one ear and out of the other*. The stimuli of the five senses must have some contact with the perception organs in order to trigger the perceptual process. Nevertheless, it is only in the cases of touch and taste that PRs are fully aware of such a requirement.

This section constitutes the physiological and perceptual background for the description of properties in Section 5.2 below.

5.2. PROPERTIES IN SENSE PERCEPTION

In the previous section, the physiology of the human perceptual systems and the perceptual processes themselves have been described. Perception entails a sequence of interrelated events. The first step is the physical energy – stimulus – that triggers the perceptual process. The second step is the sensory transduction, where this physical energy is transformed into neural events by different receptors. These neural impulses are then sent to different parts of the brain, concluding the perceptual process.

This is the general pattern followed by the five types of sensory perception analysed: vision, hearing, touch, smell, and taste. However, the requirements for each sensory modality are not the same; the stimuli, the receptors, the brain areas are different. That is to say, the way in which the perceiver, the object perceived and the act of perception itself interact with each other are not the same.

Based on the descriptions presented in Section 5.1, I propose a typology of the main **properties** that characterise the different sense modalities, and hence, the bodily basis of perception verbs. These properties are organised according to various parameters.

One parameter is the relation between the perceiver (PR), the object perceived (OP) and the act of perception (P).

Another parameter, which subdivides each of the groups above, is the distribution of these properties in each sense. Some of these properties can be applied to all the five senses, whereas others are only relevant to a specific sense. The former are called ‘A level properties’, the latter ‘B level properties’.

Finally, the last parameter is whether these properties are pure (1st order) or composed (2nd order) properties; that is to say whether or not they are the result of the interrelation of several properties.

In the next section, the properties resulting from these parameters are presented, together with a description of how they are applied to each sense.

5.2.1. TYPOLOGY OF 1ST ORDER PROPERTIES

As has been discussed in the previous section, properties are organised according to the relation between the three main elements in perception: the perceiver (PR), the object perceived (OP) and the perception (P). Following this parameter, properties are divided into three groups: (i) those resulting from the relation between the PR and the OP, (ii) those resulting from the relation between the PR and the P, (iii) those resulting from the relation between the OP and the P.

Let us examine what they are and how they correspond to each sense.

(i) Properties resulting from the relation between the PR and OP: these properties are drawn from the physiology of the senses. The properties

belonging to this first group (PR → OP) are <contact>, <closeness>, <internal>, <limits>, and <location>.

- ♦ <contact>: whether the PR must have a physical contact with the OP in order to be perceived.

This property has a negative value in the senses of vision, hear and smell; and a positive value in the senses of touch and taste. Although it is true that in the first three cases, light waves, sound waves and chemical particles in the air must reach us in order to be perceived, we do not perceive these stimuli as having direct physical contact with us, as in the other two cases of touch and taste (Sekuler and Blake 1994: 6).

- ♦ <closeness>: whether the OP must be in the vicinity of the PR to be perceived.

This property has a negative value in the case of vision and hearing; and a positive value in the remaining three senses. On the basis of this property, vision and hearing have been classified as ‘far senses’, because the eyes and the ears can pick up information coming from remote sources. Touch, smell and taste have been considered ‘near senses’, because their stimuli must be in the vicinity of the PR (Sekuler and Blake 1994: 6-7; 27). In the case of touch and taste, <closeness> is an entailment of the property <contact>; the fact that these two senses require direct contact between the PR and the OP already presupposes that the OP is near the PR. In smell, this sense works more effectively if the odorous substance is in the vicinity of the nose¹²¹.

- ♦ <internal>: whether the OP must go inside the PR to be perceived.

This property has a positive value in hearing, smell and taste; and a negative value in vision and touch. In order to perceive smells, it is necessary to inhale air into our nostrils; we take a breath and let the air come inside us, in our lungs. Each breath passes air over our olfactory sites; when we inhale, we smell odours, the odours enter our bodies. In a similar way, if we want to taste food or drink, we must place the OP inside our mouth, or touch it with the tip of our tongue, where most of our taste buds

¹²¹ It is interesting to note here that unlike the other senses the source that emits the odorous substance does not have to be present, i.e. where the PR is. The fact that the volatile chemicals from

are (Gibson 1966: 144). Perhaps the reason why we feel that these senses are internal lies in the fact that the nose, the mouth and the ears have holes or cavities and as a consequence, we perceive the stimuli of these senses as coming inside our body. However, as pointed out in Section 5.1, this is only our perception of how these senses work. In fact, in physiological terms, all senses must be internal. The light waves enter the eye, and the skin vibrations do also trigger the mechanoreceptors that will carry the neural input to the spinal cord.

- ♦ <limits>: whether the PR is aware of the boundaries imposed by the OP when perceived.

This property only applies to the sense of touch. The sense of touch allows us to experience, what Gibson (1950) denominated, ‘space perception’. We can perceive the layout of spaces as long as there are objects in these spaces; that is to say, we perceive the general layout of environmental surfaces and the particular layout of the surfaces of an object being manipulated, but a completely empty space is unperceivable. In this sense, “the surface of an organism is actually a boundary between the organism and its environment” (Gibson 1966: 101). Therefore, when we touch something, we are invading the space of that thing / person we are touching. The spaces occupied by the PR and the OP are put together, converge; however, neither of them can trespass each other’s spaces (Ibarretxe-Antuñano 1999c).

- ♦ <location>: whether the PR is aware of the situation of the OP when perceiving.

This property only applies to vision and hearing. In both senses, it is possible to localise the source of stimulus as well as the direction of the stimulus. In vision, the location of the OP in the environment relative to the PR’s current position is called ‘egocentric direction’ (Sekuler and Blake 1994: 215). This provides us with two-dimensional information: up/down, right/left. As explained in Section 5.1.1.1, the information in the two-dimensional egocentric co-ordinate system is preserved in the two dimensional retinal image. Vision gives us information about another dimension too: depth perception, i.e. how far the OP is from the PR. In hearing, one can also identify the direction from which the sounds are coming. This ability present

an odorous substance can be kept in the air is what, for example, allows animals such as the dog to follow the track left by other animals (Gibson 1966: 1948).

from the day of birth is called ‘sound localisation’ (Butterworth and Castillo 1979; Wertheimer 1961). The spatial location of sounds refers to two directions: ‘azimuth’ (horizontal direction of a sound in relation to the PR’s head), and ‘elevation’ (vertical direction) (Sekuler and Blake 1994: 359).

Taking into account the second parameter specified for the classification of these properties, namely the distribution of these properties in the senses, the properties <contact>, <closeness>, and <internal> are considered A level properties because they are applicable to all the five senses. The properties <limits> and <location> on the other hand, are classified as B level properties, as their distribution in the senses is restricted to only particular ones.

(ii) Properties resulting from the relation between PR and P. In this group, the properties included are <detection>, <identification>, <voluntary>, <directness>, <subjective>, and <emotional>.

- ♦ <detection>: how the PR performs the P: how PR discloses the presence of an object, and distinguishes one object from another¹²².

This property has a positive value in all the senses, as all of them detect their corresponding stimuli (light, sound, mechanical disturbances, volatile substances, and soluble substances) with their corresponding receptors (eyes, ears, body, nose, and taste buds). Let us illustrate this property with an example from the sense of smell. If we are in a room without any particular smell and a person starts preparing some coffee, we immediately smell the new odour; we detect that new smell, which we later recognise as coffee. After a while, we get used to the smell of coffee and no longer smell it consciously. But if somebody enters the room, that person will detect the smell of coffee straight away. This well-documented phenomenon (cf. Ahlstrom *et al.* 1986) is called ‘odour adaptation’, i.e. the decrease of sensitivity to an odour after a prolonged exposure to it. Some people believe this is due to the unique

¹²² In perceptual terms, detection and discrimination are two different hierarchically ordered perceptual processes (first we need to detect the object and then distinguish that object from other objects, see Sekuler and Blake 1994: 141). These two processes are present in the five senses. They therefore, do not add any relevant information for our purpose, namely, to create a typology of properties to differentiate the senses from each other. Thus, detection and discrimination are treated as one property in our analysis.

capability of olfactory cells to die and reproduce themselves. Similar processes of adaptation are also found in taste (Sekuler and Blake 1994: 446).

- ♦ <identification>: how well the PR can discriminate what he is perceiving, the P.

This property is negative in smell and positive in the other senses. When we use the sense of vision, for instance, if we see a dog we immediately recognise that entity as a dog, unless we have sight problems or we have never seen a dog before. This does not happen with smell. Smells are difficult to identify. The reason why we are never a hundred per cent sure about what we are smelling lies in the fact that olfactory fibres individually can detect that some odorous substance is present. However, they are unable to provide unequivocal information about the identity of that substance. Consequently, people can smell an odour, but cannot tell what odour they are smelling (Engen 1960, 1982). Furthermore, smells are difficult to name. In *De Anima* (c. 320 BC) Aristotle already pointed out the fact that the sense of smell lacks an independent classification similar to that of other senses such as taste (*sweet, bitter...*), and in fact, the situation nowadays has not changed. There have been various attempts¹²³ to classify smells, such as Henning's 'Smell Prism' (1916) and Schiffman's 'Multidimensional Scaling' (1974). Unfortunately, as Buck (1949:1024) remarks, "the only widespread popular distinction is that of pleasant and unpleasant smells – good and bad smells [...] this is linguistically more important than any similar distinction, that is, of good and bad, in the case of the other senses". Otherwise, the terms used for defining a smell are taken either from other senses, primarily from taste (cf. *sweet*) and touch (cf. *pungent*, originally 'pricking') or by naming the object that emits the smell, as the *smell of an apple*.

This does not happen in the other senses. For example, as discussed in Section 5.1.1.1, vision can offer us information about the colour of the OP. If we look at dictionaries, many colour names are listed. But as shown in studies such as Berlin and Kay (1969), Ratliff (1976), in everyday language only a dozen colour names are needed. Although the identification of colours varies among people, there is a great deal of agreement on names for only those few basic colours (Boynton and

¹²³ For a complete discussion on the topic of the classification of odours, see Sekuler and Blake (1994: 414-418). Glamble (1921) is a good review and critique on Henning's method.

Olson 1987). Another case is the classification of different tastes. Although there has been and still are different opinions about the basic tastes (see Schiffman and Erickson 1980), it is now commonly agreed that there are four basic distinct categories: sweet, sour, salty, and bitter.

♦ <voluntary>: whether the PR can choose when to perform a P.

This property has a negative value in hearing and smell and a positive value in vision, touch and taste. In these three sense modalities, the PR can choose whether to look at something, or to touch something¹²⁴ or to put something in his mouth. However, in the case of hearing and smell, the PR does not have control over the perception. It is true that the PR can block the perception by putting his fingers on his ears or nose, but usually we perceive by these senses unconsciously. Unless we suffer from any kind of hearing or olfactory disorder, we perceive through these senses all the time. Studies in smell (Badia 1995) indicate that we smell a wide variety of odours throughout every day and night of our lives, but without being aware of them at all. Only when a smell pleases, annoys, warns or brings a memory do we stop to take notice of it.

The values assigned to the senses relative to this property are the default values; that is to say, usually this is the way in which these sense modalities are perceived. However, it is important to bear in mind that this property depends on the role of the PR that performs the perceptual process. In perception, the PR can be an active PR or a passive PR (see Section 2.2. for the linguistic implications of this distinction). In every sense modality, the PR can perform an active perception, in which case the property <voluntary> takes the positive value, or the PR can perceive passively, in which case the value of <voluntary> is negative. For instance, in the case of smell, it has already been mentioned that we smell all the time, even when we are asleep, but always without being conscious of it. This is the default situation for the sense of smell and therefore <voluntary> takes a negative value. However, if we are presented with a new perfume and we want to know what it smells like we are not perceiving its fragrance in a passive way, we are active PRs. In this case, the value of the property <voluntary> is positive.

¹²⁴ This <voluntary> property of the sense of touch has been labelled as 'active touch' or 'haptics' (Gibson 1966).

- ♦ <directness>: whether the P depends on the PR directly, or is mediated by another element.

This property has a negative value in hearing, and a positive value in the rest of the senses. In all the senses but in hearing, the PR perceives the OP directly. If we want to look at something we just have to open our eyes and direct them to what we want to perceive. If we want to touch something we have to put some part of our body, usually our hand, in contact with the OP. If we want to taste something, we have to put it in our mouth. This does not hold in the case of hearing. We cannot hear a sound unless it is produced by a third element. In a way, the PR is dependable upon the element that emits the sound. It is in this sense that we understand hearing as a mediated perception.

Taking into account the second parameter (the distribution of these properties in the senses), the properties <detection>, <identification>, <voluntary>, and <directness> are considered A level properties because they are applicable to all the five senses. There are no B level properties identified in this group.

(iii) Properties resulting from the relation between OP and P. This group comprises the properties <effects>, <briefness>, and <evaluation>. In this group, no A level properties are found. All of them seem to be particular to only some specific senses and not applicable to others.

- ♦ <effects>: whether the P causes any change in the OP.

This property is only applicable to touch. Active touch is one of the most reliable methods that we have to explore our environment. As Sekuler and Blake (1994: 380) put it “when the other senses conflict, touch is usually the ultimate arbiter”. However, when exploring an object via the sense of touch, actions can change the OPs. The extremities are not only exploratory sense organs, but also performatory motor organs (Gibson 1966: 99). We can not only explore things with our hands but also alter them.

- ♦ <briefness>: how long the relation between P and OP should be in order for the perception to be successful.

This property is only applicable to touch and taste. The skin is stimulated by the smallest mechanical disturbance. With only a very brief touch on a surface, it is

possible to tell how firm, smooth this surface is. It is even possible to tell the temperature of the surface (Gibson 1966: 109 calls this ‘touch temperature’). Although sensitivity in the different areas of the tongue varies (Collings 1974), when we put into contact the tip of the tongue with a sugar cube, we only need a couple of seconds to decide that it is sweet. Studies (Miller and Bartoshuk 1991) show that for most people, the highest sensitivity is to bitter tastes. It could be argued that this property should be applicable to vision, as we do not need to look at things too long in order to identify them. For instance, if we are driving our car and a police car passes near us, we need only a few seconds to recognise it as a police car. However, the fact that we identify the car as a police car straight away is not the result of a visual perceptual process, but the result of an inferential process. That is to say, we are able to recognise the car because of the context we are in – driving our car on a road –, because of our familiarity with the visual clues associated with a police car: flashing lights of different colours, white cars with fluorescent lines and so on. In other words, based on the context and our familiarity with the OP, we infer that the car is a police car. The same argument can be applied to hearing. It does not take too much time to recognise familiar sounds, somebody calling out our name, to understand sounds in our own language. This is not based on the perceptual process itself – as it is in touch and taste – but on our familiarity with the OP and the context in which the OP is found.

♦ <evaluation>: whether the P assesses the OP.

This property is only applicable to vision and taste. Vision is the sense upon which Western society relies most. We tend to make judgements based on the information we receive from what we see. The judgements carried out on the basis of taste perception are of a different kind. People can rate various tastes along the dimension of pleasant / unpleasant. These judgements are called ‘taste hedonics’ (Sekuler and Blake 1994: 449).

5.2.2. SUMMARY

In the previous section, a typology of the main properties that characterise the different sense modalities has been presented. These properties are organised in accordance with two parameters: one parameter is the interrelations between the

three elements involved in the perceptual process: PR, OP, and P. Another parameter is the distribution of these properties in the senses. All the properties proposed in this section are considered ‘1st order properties’. The classification of these properties is summarised in Table 5.1.

At this point, it is important to comment very briefly on the terminology used when describing these 1st order properties in Table 5.1. According to the second parameter, 1st order properties are classified into two groups: ‘A level properties’ (applicable to all senses) and ‘B level properties’ (applicable to only some senses). For ‘A level properties’, there are two different values assigned to the property: positive and negative. *yes* and *no* express this respectively. For ‘B level properties’, a *yes* indicates those senses to which the property is applicable. Empty boxes mean that the respective property is not applicable to that sense.

(1)	(2)	Properties	VISION	HEAR	TOUCH	SMELL	TASTE
PR → OP	A	<contact>	no	no	yes	no	yes
		<closeness>	no	no	yes	yes	yes
		<internal>	no	yes	no	yes	yes
		<directness>	yes	no	yes	yes	yes
	B	<limits>			yes		
		<location>	yes	yes			
PR → P	A	<detection>	yes	yes	yes	yes	yes
		<identification>	yes	yes	yes	no	yes
		<voluntary>	yes	no	yes	no	yes
	B	-----					
OP → P	A	-----					
	B	<effects>			yes		
		<evaluation>	yes				yes
		<briefness>			yes		yes

Table 5.1: Organisation of ‘1st order properties’ in the sense modalities.

5.2.3. TYPOLOGY OF 2ND ORDER PROPERTIES

A '2nd order property' is a property that is composed of some 1st order properties. All 2nd order properties are 'B level properties'; that is, they are only applicable to some senses. There are two 2nd order properties <correction of hypothesis¹²⁵> and <subjective>.

- ♦ <correction of hypothesis> (<cor. hyp.>): how correct and accurate the hypotheses formulated about the OP in the P are in comparison with the real object of P.

This property is composed of <directness> and <identification> and only seems to apply to vision, hearing and smell. When we perceive with these three senses, we formulate hypothesis about the nature and characteristics of the OP. Depending on the sense we use these hypotheses correspond more or less to the nature of the real object. The hypotheses about the OP formulated on the basis of the information gathered by the three senses seem to be more correct in the case of vision, followed by hearing¹²⁶ and the by smell. The reasons for this hierarchy in reliability must lie in the values that the two 1st order properties that compose <correction of hypothesis> take in each case. These are reproduced in Table 5.2.

	VISION	HEARING	SMELL
<directness>	yes	no	yes
<identification>	yes	yes	no

Table 5.2: Distribution of 1st order properties in <correction of hypothesis>.

As is seen in Table 5.2, vision has a positive value for both <directness> and <identification>. The fact that there are no mediators in the perception, as well as the fact that the identification of what we see is very accurate, make the hypotheses resulting from vision the ones that correspond best to the real object. Hearing is also very good at identifying what is heard, however its hypotheses are not as correct as vision because the P depends on the source of sound. Smell has a positive value for

¹²⁵ I would like to thank Antonio Barcelona for suggesting this property.

¹²⁶ In fact, this is very clear in court cases; the testimony given by an *eyewitness* is considered to be more reliable than *hearsay* evidence (Dundes 1972: 12; Danesi 1990: 222)

<directness>, but as discussed in the previous section, it is very difficult to identify exactly what is being perceived by this sense accurately. The distribution of the values in these properties and the perceptual processes in these senses are illustrated in the following figures. The smiley represents the PR, the box the OP, and the arrow the P.

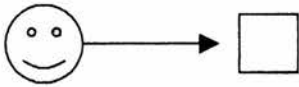


Figure 5.1: Vision



Figure 5.2: Hearing



Figure 5.3: Smell

In Figure 5.1 and 5.3, the direction of the arrow (P) goes from the PR to the OP, whereas in Figure 5.2, the direction is the other way round, from the OP to the PR. The direction of the arrow represents the property <directness>. In Figure 5.1 and 5.2, the box that represents the OP has continuous lines meaning that it is easily identifiable. The discontinuous lines in the box in Figure 5.3 show the difficulty of identification of the OP in the case of smell. A common characteristic of the three figures is that the arrow does not have a contact with the OP. If we recall the typology of 1st order properties, these three senses are all <contact_{no}>. Another property that is shown in these figures is <internal>. In the case of vision, the property is <internal_{no}>. Consequently, the arrow (P) does not come inside the smiley (PR). In hearing and smell the property is <internal_{yes}> and as such, the arrow (P) goes inside the smiley (PR).

Similar figures can be applied to the other two senses: taste and touch.



Figure 5.4: Taste

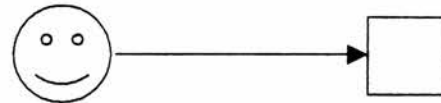


Figure 5.5: Touch

Contrary to vision, hearing and smell, both taste and touch have <contact_{yes}>, as represented by the arrow (P) in Figures 5.4 and 5.5. The difference between these

two senses seems to lie on the fact that whereas taste is <internal_{yes}>, touch is <internal_{no}>.

If we compare the properties and the values attached to them in each of the five senses, we come to the conclusion that the only property that seems to be decisive when distinguishing between the senses in relation to the 2nd order property <correction of hypothesis> is <contact>. This property takes a negative value in vision, hearing and smell, and a positive value in taste and touch. Based on this observation, we can state the following constraint:

CONSTRAINT: <contact_{yes}> incompatible with 2nd order <cor. hyp.>

As we shall see in the following chapter (Section 6.1), this constraint applies to the way in which we use vocabulary from the semantic domain of perception, and to the inferences that we can draw from such perception vocabulary.

♦ <subjective>: how much influence the PR has on the P.

This property is composed of <internal> and <closeness> and only seems to apply to smell and taste. Although not everybody perceives the stimuli in the same way in vision (colour, see Sekuler and Blake 1994: 181), hearing (loudness, see Sekuler and Blake 1994: 337) and touch (Sekuler and Blake 1994: 382), the information gathered by these senses is more consistent than that in smell and taste. To start with, smell and taste are perceived as <internal> senses, that is, the OP comes inside the PR, this makes the OP be perceived as attached to the PR himself. When looking at a round table all PRs will perceive the table as being of a rounded shape, although PRs may not agree on whether its shape is that of a perfect circle or more like a oval. In taste and smell, the PR's perceptions of the stimuli vary a great deal. Smells and tastes are different for people. A nice smell or taste for one person could be bad or simply neutral for another. Smell and taste are both cultural phenomena (Classen *et al.* 1994). Smells and tastes are context dependent, that is, the same substance can be perceived in different ways depending on the smells and tastes in the same environment, a property widely used in the art of cuisine. That is why the property <closeness> is one of the components of <subjectivity>. As was pointed out in Section 5.1, a possible physiological reason for the application of this

property to smell and taste only is the fact that part of the brain region that analyses the input of these two senses is the limbic system, which plays an important role in emotional reactions (Sekuler and Blake 1994:444).

The fact that perception with smell and taste varies a great deal depending on the PR is reflected in the positive value that the two 1st order properties that compose <subjective> have. Table 5.3 represents the distribution of these two 1st order properties in the senses.

	VISION	HEAR	TOUCH	SMELL	TASTE
<internal>	no	yes	no	yes	yes
<closeness>	no	no	yes	yes	yes

Table 5.3: Distribution of 1st order properties in <subjective>.

As seen in Table 5.3, although these two 1st order properties are also positive in other senses, the fact that both of them are positive in smell and taste seem to be the decisive factor for the restrictive application of <subjective> to smell and taste only. The property <internal> is not only positive in smell and taste, but also in hearing. The second property <closeness> is positive in smell and taste, as well as in touch. Therefore, the constraint that restricts the application of this property to smell and taste is the following:

CONSTRAINT: if <subjective>, then <internal> and <closeness> must be _{yes}

It is important to notice that although this property applies to both smell and taste, the kind of subjectivity in each sense is different. This depends on how the OP is perceived by these senses. In smell, the identification of the OP is not very accurate. Whereas in the case of taste the subjectivity refers more to the description of the OP itself, in smell it seems to apply more to the whole act of perception itself. For example, sentences (8) and (9):

(8) His *taste* in clothes is very good

(9) I *smell* something fishy around here

In (8), the OP refers clearly to the clothes, whereas in (9) the OP remains blurred, the PR does not really know what the source of the smell is, he only detects that there is something wrong there (see the representation of the OP in Figures 5.3 and 5.4). This difference in the perception of the OP refers to the property <identification>. This property – as discussed in Section 5.2.1 – takes a negative value in smell and a positive value in taste and seems to be what makes the property <subjectivity> different in these two senses.

5.2.4. SUMMARY

In this section, a typology of the 2nd order properties has been presented. 2nd order properties are those that are composed of some 1st order properties. There are two 2nd order properties: <correction of hypothesis>, composed of <directness> and <identification>; and <subjectivity>, composed of <internal> and <closeness>. All 2nd order properties are B level properties; that is, they are only applicable to some senses. Table 5.4 shows this typology.

The same symbols used in Table 5.1 above are applicable here. A level properties (1st order properties here only) have both negative and positive values represented by *yes* and *no* respectively. B level properties have a *yes* only in those senses to which they can be applied and empty boxes for the rest.

2 nd order	1 st order	VISION	HEAR	TOUCH	SMELL	TASTE
<cor. hyp.>		yes	yes		yes	
	<directness>	yes	no	yes	yes	yes
	<identification>	yes	yes	yes	no	yes
<subjective>					yes	yes
	<internal>	no	yes	no	yes	yes
	<closeness>	no	no	yes	yes	yes

Table 5.4: Organisation of 2nd order properties in the sense modalities.

5.3. PROPERTIES VS. SEMANTIC FEATURES

In the previous section, a typology of the properties that characterise sense perception has been presented. These properties should not be confused with the so-called ‘semantic features (components, markers)’ introduced in the framework of Componential Analysis (Katz and Fodor 1963; Katz and Postal 1964; Weinreich 1966; Bierwisch 1970; Katz 1972). In this approach, the meanings of lexical items are not unitary concepts, undifferentiated wholes. Meanings can be analysed into atomic conceptual elements related to each other in several ways; they are complexes formed by different components of meaning. These atomic concepts are in themselves semantic primitives – they cannot be reduced to smaller units – and are symbolically represented by semantic markers¹²⁷.

These semantic features (markers, components) are theoretical constructs intended to represent a concept that is part of the sense of a lexical item and other constituents in natural languages. As Bierwisch (1970: 181) puts it “they are not defined in terms of physical properties and relations outside the human organism but symbols for the internal mechanism by means of which such phenomena are conceived and conceptualised”.

For example, the meaning of the lexical item *man* is composed of the following semantic features: [animate], [human], [male] and [adult].

Semantic features reflect the systematic semantic relations that exist between a lexical item and the rest of the vocabulary of the language. They exhibit the semantic structure in a dictionary entry and the semantic relations between dictionary entries. In other words, they are used to structure the vocabulary of a language.

A classical example of how these features structure the vocabulary is illustrated in the analysis of the word *bachelor* (see Katz and Postal 1963). This word can have four different meanings (i) a person never married, (ii) a young knight serving under the standard of another knight, (iii) a person who has the lowest

¹²⁷ Katz and Fodor (1963) and Katz and Postal (1964) distinguish between ‘semantic markers’ and ‘semantic distinguishers’. Both are the symbolic devices which represent the atomic concepts that form the meaning of a lexical item, but whereas markers are “the formal elements that a semantic component uses to express general semantic properties”, distinguishers are “the formal elements employed to represent what is idiosyncratic about the meaning of a lexical item” (Katz and Postal 1964: 14).

academic degree, and (iv) a young fur seal without a mate during the breeding time. Semantic features can represent the semantic relations that hold among these four senses of the same lexical item. For instance, meanings (i), (ii) and (iii) are opposed to (iv) on the basis of the feature [human] vs. [animal]¹²⁸.

Semantic features do not only show the relations that exist between the different senses of the same lexical item, but also those between different lexical items. For example, the word *bachelor* and the word *spinster* share the features [human], [unmarried] and [old], but are differentiated by the feature [male]-[female].

Semantic features are not part of the language being described, but part of a meta-language, the theoretical vocabulary set up to describe languages. A feature like [human] or [male] is not an English word, but a construct represented by one. Therefore, these features are not particular to a language, a semantic field; they are universal (see Kempson 1977: 88, for a discussion on this universal character of features).

In sum, semantic features are abstract, universal, theoretical constructs. They are the means by which meanings of lexical items can be decomposed into atomic concepts, for structuring the vocabulary of natural languages.

The properties defined in Section 5.2 are totally different from semantic features. These properties are not abstract, theoretical constructs. As we have seen in the discussion, these properties come from the description of the physiology of the five senses and from our perception of these perceptual acts. They are understood as shorthand ways of referring to the defining properties that describe how we perceive through these senses.

These properties are not semantic primitives, components of meaning grouped together to form the complexes that make up the meaning of words. As will be shown in the next chapter, these properties represent and describe the bodily basis upon which metaphorical and non-metaphorical extended meanings in the field of perception verbs are based.

¹²⁸ The formal representation of an incompatible pair of features such as [human]-[animal], [male]-[female], is represented by the value + or - of one feature (see Kempson 1977 for a discussion of this representation).

These properties are not an exhaustive specification of the meaning of words (as there is much more to perceiving than shown in Table 5.5 below). They are much more akin to meaning postulates than componential analysis – but again they differ in that the relation is not a purely logical one and what is being characterised is not a relation between vocabulary items but physical characteristics obtained independently of language.

These properties are not to be considered universal and applicable to any semantic field as semantic features are. They only apply to the field of sense perception. It will be necessary to define a totally different set of properties for the description of other semantic fields. As a consequence, these properties cannot be used to structure the vocabulary of natural languages, either syntagmatically or paradigmatically.

5.4. CONCLUSIONS

In this chapter, I have characterised the semantic field of sense perception in terms of properties. These properties are to be considered the bodily basis upon which our sense-related vocabulary is based. The description of this bodily basis is crucial for my study. They will provide the devices necessary to explain and constrain not only why some source domains are mapped onto very specific target domains and not others, but also what elements can take part in the creation of extended meanings.

Section 5.1 has described the physiology of the five senses and the way in which human beings understand the perceptual processes. In Section 5.2, a typology of the main prototypical properties that characterise the source domain of sense perception was presented. The independence of description of the source domain is guaranteed by the fact that these properties are based on physiological and psychological studies on the senses. They are not simply the result of a post hoc analysis of the semantic extensions found in the target domain (see Keysar and Bly 1995; Murphy 1996, for a discussion on this issue). These properties are classified following three parameters: (i) the relation between the PR, the OP and the P, (ii) the applicability of the properties to the senses, and (iii) the interrelation among properties. The distribution of these properties in each sense is shown in Table 5.5.

Finally, in Section 5.3, the differences between these properties and the semantic features used in Componential Analysis have been stated. These properties are not considered to be innate atomic conceptual units that, when combined differently, form the meanings of different words. They are rather taken as shorthand ways of referring to the defining properties used to describe how we perceive through the senses.

VISION	HEAR	TOUCH	SMELL	TASTE
<contact _{no} >	<contact _{no} >	<contact _{yes} >	<contact _{no} >	<contact _{yes} >
<closeness _{no} >	<closeness _{no} >	<closeness _{yes} >	<closeness _{yes} >	<closeness _{yes} >
<internal _{no} >	<internal _{yes} >	<internal _{no} >	<internal _{yes} >	<internal _{yes} >
<direct. _{yes} >	<direct. _{no} >	<direct. _{yes} >	<direct. _{yes} >	<direct. _{yes} >
		<limits _{yes} >		
<location _{yes} >	<location _{yes} >			
<detection _{yes} >	<detection _{yes} >	<detection _{yes} >	<detection _{yes} >	<detection _{yes} >
<identific. _{yes} >	<identific. _{yes} >	<identific. _{yes} >	<identific. _{no} >	<identific. _{yes} >
<voluntary _{yes} >	<voluntary _{no} >	<voluntary _{yes} >	<voluntary _{no} >	<voluntary _{yes} >
		<effects _{yes} >		
		<briefness _{yes} >		<briefness _{yes} >
<evaluation _{yes} >				<evaluation _{yes} >
<cor. hyp. _{yes} >	<cor. hyp. _{yes} >		<cor. hyp. _{yes} >	
			<subjectiv. _{yes} >	<subjectiv. _{yes} >

Table 5.5: Organisation of 1st and 2nd order properties in the sense modalities.

In the following chapter, it will be discussed how the properties defined in this chapter constrain and explain how some meanings are conveyed by certain perception verbs and not others. I concentrate on the semantic extensions of only two sense perceptions: smell and touch. Based on the properties that describe these two senses, I propose a solution for two of the problems left unsolved by other approaches: how to account for physical extended meanings and how to constrain what is generally known by cognitive linguists as the ‘used’ part of metaphor. This solution is called ‘Property Selection Processes’.

CHAPTER 6: PROPERTY SELECTION PROCESSES.

In the previous chapter, it has been seen how the physiology and function of human perceptual systems influence and determine the way in which we use our language relative to sense perception. The way in which we experience, perceive and interact with the world that surrounds us must be reflected in our vocabulary, because, as Rudzka-Ostyn puts it, “a word that has taken root in a language cannot acquire just any new sense” (1995: 218). The five different perceptual systems were characterised in terms of properties. These properties are the means by which it is possible to solve the question of why some source domains are mapped onto very specific target domains and not others.

In this chapter two other unsolved puzzles are discussed. Once the source domain is characterised by these properties, the next question is which, how, and how many of these properties are to be present in the target domain in order to constrain metaphor. Section 6.1 illustrates how these properties are applied to language. Here, only two properties <contact> and <correction of hypothesis> are analysed in order to show that conceptual mappings between source and target domains are not a matter of sheer chance but constrained by our experience of perception. In Section 6.2 Property Selection Processes are introduced. These processes are constraints on mappings between the source and the target domain, both in metaphorical and physical extended meanings. Finally, some conclusions are drawn in Section 6.3.

6.1. PERCEPTION AND LANGUAGE

In the previous chapter, it has been described how human perceptual systems and processes function (Section 5.1.). This was followed by a typology of the main properties corresponding to these descriptions (Section 5.2). The question now is whether, as predicted by Cognitive Linguistics, it is true that the properties that

characterise these senses can be traced in the way we use expressions related to these sense modalities.

In this section, I pick up only some examples from the five different senses in order to give a taste of how this assumption works. In the next section, I shall concentrate on two of these senses – smell and touch –, and offer an analysis of the different meanings that olfactory and tactile verbs convey and how each meaning can be explained by using these properties.

6.1.1. THE PROPERTY <CORRECTION OF HYPOTHESIS>

The property <correction of hypothesis> only applies to vision, hearing and smell. It does not apply to touch and taste because of the constraint: <contact_{yes}> which is incompatible with <correction of hypothesis>.

Let us see how this is expressed in language in the following sentences.

- (1) I *saw* that there was going to be trouble
- (2) I *heard* that there was going to be trouble
- (3) I *smelt* that there was going to be trouble
- (4) *I *touched* that there was going to be trouble
- (5) *I *tasted* that there was going to be trouble

As seen in these examples, the proposed constraint¹²⁹ for touch and taste seems to work when we look at sentences such as (4) and (5). Both senses share the property <contact_{yes}>, and it is precisely this characteristic that prevents these sentences from being felicitous, on the one hand it is not possible to touch or taste trouble without having a contact, either physical or metaphorical; on the other hand, the positive value of the property <contact> in these two cases makes the formulation of hypotheses unnecessary. Whereas the first three sentences make sense, the last two are not acceptable. The meaning in (1), (2) and (3), however, is not the same. (1) can be paraphrased as ‘to know’, (2) as ‘to be told’ and (3) as ‘to guess, to suspect’.

¹²⁹ Constraint: <contact_{yes}> incompatible with 2nd order <correction of hypothesis> (see Section 5.2.3).

The degree of correctness between the hypotheses inferred from the Ps and the real object in each sentence varies accordingly. In the case of vision, it is me – the PR – that figures out that there was going to be some trouble; I saw some indications that clearly pointed to me that there were going to be some problems. This reflects the properties <directness_{yes}> and <identification_{yes}> in vision. In (2), I myself did not see *with my own eyes* that there was going to be trouble, another person told me so; and as experience tells us, sometimes what other people say, especially when reporting some event, is not always very accurate. This reflects the property <directness_{no}> in hearing. Finally in (3), I myself perceived that there was going to be trouble, but the indications to that conclusion were not very clear, the evidence for such an assumption is not strong enough for me to be sure of them. This reflects the property <identification_{no}> in smell.

6.1.2. THE PROPERTY <CONTACT>

The property <contact> takes a negative value in vision, hearing and smell; and a positive value in touch and taste. This is illustrated in the following examples:

- (6) I *saw* victory
- (7) ? I *heard* victory
- (8) I *touched* victory
- (9) I *smelt* victory
- (10) I *tasted* victory

The meaning in those examples where we use touch and taste implies some kind of contact with *victory*, the OP. In (8), the meaning is ‘to reach’. This refers to a situation where, after fighting for some time, I obtain my victory, my goal. In this meaning, as we shall see in the next chapter, other properties are present as well, namely <limits> and <briefness>. In (10), the meaning conveyed by the verb is ‘to experience’; I experience what victory was in my own flesh. It is important to notice that what makes the readings in (8) and (10) different from each other is not the fact that they both are <contact_{yes}>, but the property <internal>. In the sense of touch,

this property is <internal_{no}>, and in taste <internal_{yes}>. The different values that this property takes in each case explain why these meanings are different.

As a result of being <contact_{no}>, the readings for the rest of the sentences are not understood in the same way. Sentence (6) implies an intellectual process such as ‘to foresee’. Sentence (7) is not very felicitous. It can be understood as a physical perception of the word *victory* uttered by somebody. Alternatively, in sentences like *I heard that there was a victory*, the meaning is ‘to be told’. Sentence (9) takes the meaning ‘to guess, to sense’.

6.1.3. SUMMARY

In this section, it is shown how two of the properties defined in the previous chapter, <correction of hypothesis> and <contact>, constrain and explain how and why some meanings are conveyed by certain perception verbs and not by others. In the following section, I shall develop this proposal and apply it to the analysis of the extended meanings lexicalised by tactile and olfactory verbs. The choice of olfactory and tactile verbs for the application and support of the theoretical hypotheses put forward in this chapter, as well as in Chapter 7, is arbitrary. That is, I have focused on these verbs and their extended meanings because they have not been investigated as much as other sense verbs, e.g. vision. These hypotheses, however, are applicable to all the semantic extensions that exist in all perception verbs.

6.2. PROPERTY SELECTION PROCESSES IN TOUCH AND SMELL.

In Chapter 2 the main cross-linguistic meanings of the five perception modalities have been analysed. These meanings are divided into two categories: on the one hand, the so-called ‘prototypical’ meanings, i.e. those meanings that refer to physical perception through these senses; on the other, the ‘non-prototypical’ meanings, i.e. extended meanings, physical and non-physical, conveyed by perception verbs. Prototypical meanings are classified into three groups according to the semantic role of the arguments that these verbs take. These groups are experience (animate experiencer subject), activity (animate active subject) and percept

(experienced entity as subject)¹³⁰. Non-prototypical extended meanings in tactile verbs are ‘to partake of food/drink’, ‘to affect’, ‘to reach’, and ‘to deal with’. Non-prototypical meanings in olfactory verbs are ‘to trail something’, ‘to guess’, ‘to suspect’ and ‘to investigate’.

In Chapter 5, a typology of the properties that characterise the senses was presented. The properties in touch and smell are summarised in Table 6.1. These properties are called **prototypical** because they describe how we think that we perceive through these senses, which is, in turn, the bodily and cultural basis for the physical prototypical meanings of these sense verbs.

PROPERTIES IN TOUCH	PROPERTIES IN SMELL
<contact _{yes} >	<contact _{no} >
<closeness _{yes} >	<closeness _{yes} >
<internal _{no} >	<internal _{yes} >
<directness _{yes} >	<directness _{yes} >
<limits _{yes} >	
<detection _{yes} >	<detection _{yes} >
<identification _{yes} >	<identification _{no} >
<voluntary _{yes} >	<voluntary _{no} >
<effects _{yes} >	
<briefness _{yes} >	
	<correction of hypothesis _{yes} >
	<subjectivity _{yes} >

Table 6.1: Prototypical properties in touch and smell

I have already presented the extended meanings of these tactile and olfactory verbs, and characterised the source domain in terms of properties that show us the bodily basis for these mappings between different conceptual domains. The next issue is to determine how much and what part of the source domain is actually transferred onto the target domain, that is to say what constrains the mappings between target and source domains.

¹³⁰ Later in the discussion of smell verbs, the property <voluntary> is used to explain these differences between experience, active and percept verbs.

6.2.1. METAPHORICAL CONSTRAINTS: THE INVARIANCE PRINCIPLE.

It is commonly agreed among metaphor researchers that not everything from the source domain gets mapped onto the target domain. Lakoff and Johnson (1980: 52) call this partial map of the structure of the source domain the ‘used’ part of metaphor (cf. also Johnson 1987: 106).

In the case of tactile and olfactory perception, which is characterised by the set of properties defined in Table 6.1 above, this statement means that not all these properties are ‘used’ in the target domain but only a selection of them.

However, in order to constrain metaphorical mappings it is not enough to say that there is a selection of the source domain. On the contrary it is necessary to show exactly what it is that is partially mapped and what constraints are applied to that selection. Attempts to constrain the mapping process in metaphorical production and comprehension can be found in Lakoff’s (1993) ‘Invariance Principle’, i.e. “metaphorical mappings preserve the cognitive topology of the source domain in a way consistent with the inherent structure of the target domain” (1993: 215).

The basis of the Invariance Principle is presented implicitly but not analysed in Lakoff and Turner (1989). The idea that not everything is transferred from the source domain to the target domain is suggested, when these authors discuss how the maxim of quantity guides us to exclude various components of the source and target domains from the metaphorical mapping.

This basis is formulated as the ‘Invariance Hypothesis’ in Lakoff (1989, 1990). This hypothesis claims that “metaphorical mappings preserve the cognitive topology (that is, the image-schema structure) of the source domain” (1990: 54). In other words, the topological properties of entities in the source domain of a metaphorical mapping are mapped as properties of the corresponding entities in the target domain.

Re-examining this hypothesis, Brugman (1990) points out several problems¹³¹, one of which concerns the question of which domain’s properties are preserved in a metaphorical mapping. That is to say, it is not clear enough from the

¹³¹ See also Turner (1990a, 1991: 172-182, 1996: 108-109), Iwata (1995).

formulation of the Invariance Hypothesis whether the source domain properties that are transferred create the image-schematic structure in the target domain or not.

According to Turner (1990b, 1993), what matters is the image-schematic structure of the target domain. This structure must be preserved, and the image-schematic structure of the source domain that takes part in the mapping must be consistent with that preservation.

Taking into account these problems, Lakoff (1993) reformulates the Invariance Hypothesis and proposes the ‘Invariance Principle’. This principle makes explicit two claims. Not only must both source and target domain properties be taken into account, but also target domain properties must be seen as playing a central role in determining the properties preserved.

The Invariance Principle is useful in order to constrain the nature of metaphorical mappings: that is to say, it is not possible to map from the source domain structure that does not preserve the inherent structure of the target domain. The only problem with this principle is that it does not show exactly what part of the source domain is the one that must be consistent with the structure of the target domain.

As a solution, I propose the processes called **Property Selection**. These processes will show not only how some of the set of properties that characterise the source domain are mapped onto the target domain, but also what properties are mapped. It is precisely by this selection of properties from the source domain in the target domain that metaphorical mappings are constrained. The properties selected in the target domain must be part of the properties identified in the source domain and no others. The number of properties from the source domain preserved in the extended meanings is not an issue, as this is not the same in each extension. What is important is the fact that there is a transfer of only some properties from the source to the target domain.

The fact that all the examples in the following subsections are taken from English does not mean that Property Selection Processes are language specific. In Chapter 2, it was shown how these extended meanings are cross-linguistic, they are also found in the other two languages under investigation – Basque and Spanish.

Therefore, it is assumed that Property Selection Processes are applicable to any language.

In the following subsections, it is shown how these processes work in the semantic fields of tactile and olfactory verbs.

6.2.2. PROPERTY SELECTION PROCESSES IN TOUCH

One of the extended meanings in tactile verbs is ‘to affect, physically’, as illustrated in (11).

(11) Blackfly *touched* the flowers

Example (11) states that a type of insect called ‘blackfly’ physically touched the flowers and since this insect is harmful to them, the flowers were affected, and ultimately spoilt in some way.

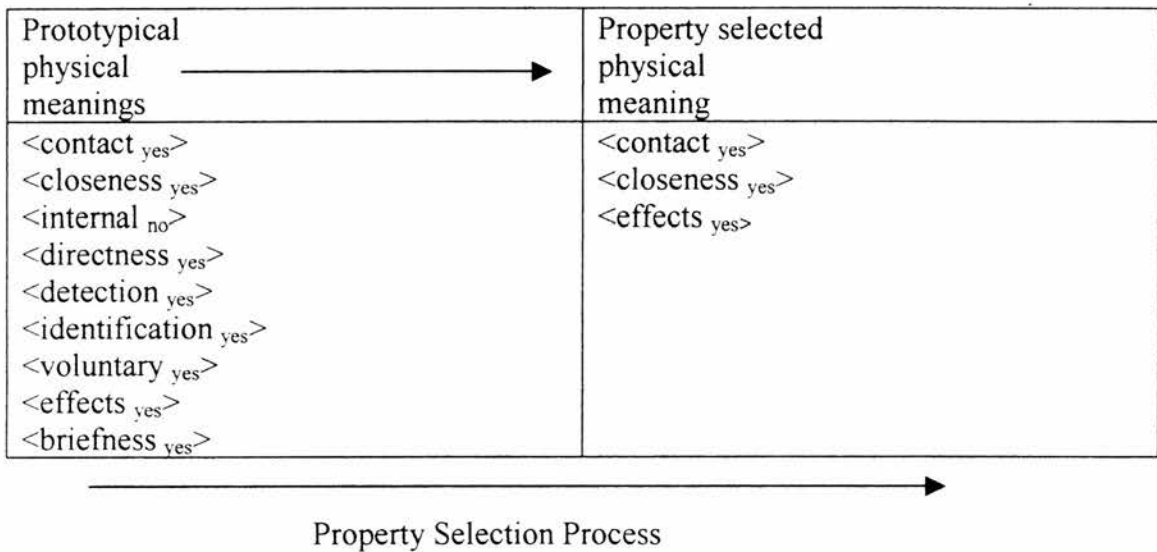


Figure 6.1: Property Selection Processes in (11) ‘to affect, physical’.

In this meaning, it is argued that only three properties¹³² from the set of prototypical properties that characterise the sense of touch are selected, namely

¹³² An issue that needs further research is the question of why there is only a number of properties, two or three, selected out of a large array of physiological motivated properties. Although I cannot give a full account for it yet, a possible reason for this selection may be metonymy. Barcelona (p.c.) suggests that “a substructure of the target (consisting of a number of *closely related* properties, e.g., contact + effect of contact) is selected. Then the source is searched to find the same set of properties in it, and it is these properties only that are mapped in physical extended meanings

<contact_{yes}>, <closeness_{yes}> and <effects_{yes}>. This selection of only some properties from the source domain is what is called ‘Property Selection’. The Property Selection Process in (11) is represented in Figure 6.1.

This meaning selects the property <contact_{yes}> because the fly is on the flowers, the fly touches the flowers and obviously, this means that there is some contact between this insect and the flowers. If there is some contact between these two entities, then it is implied that both entities are close to each other, hence the property <closeness_{yes}>¹³³. The property <effects_{yes}> is selected because there has been some change in the original state of the flowers as a consequence of the contact between the blackfly and the flowers.

In (11), the meaning remains physical, although it is not the same as the prototypical meaning in tactile verbs. There has been a shift from the prototypical physical meaning of touch to a different physical domain ‘to affect, physically’. This type of physical extension, as argued in Chapter 4, remained unexplained in Sweetser’s theory. However, Property Selection Processes solve this problem. These processes show how the mapping between the source domain (prototypical physical touch) and the target domain (affect physically) is established, i.e. by the selection of some properties from the source domain in the target domain.

The meaning ‘to affect’ can also be interpreted metaphorically as in (12) below.

(12) John *touched* me very deeply

In this case, a person called John said or did something that had an effect on me. The situation is exactly the same as in (11) and the same properties (<contact_{yes}>, <closeness_{yes}> and <effects_{yes}>) are selected. However, there is a significant difference between (11) and (12): whereas in the former the meaning is physical, in the latter the meaning is metaphorical. The meaning in (12) has taken another step on top of Property Selection, that of metaphor. These two steps are represented in Figure 6.2.

(metonymy), and in metaphorical senses, if the other properties of the source are incompatible with the target’. Whether or not metonymy can explain this selection of properties is an area that I would like to investigate in the future.

In (12), apart from the selection of properties from the source domain by means of Property Selection Processes, there is a metaphorical mapping from the domain of touch onto the domain of emotion. The agent that touches is the one that causes the emotion and the contact he has is the action that causes the emotion, while the effect in this case, instead of being physical, is the emotion caused by this action.

It is important to bear in mind that the extended metaphorical meaning ‘to affect, non-physically’ comes from the first prototypical meaning ‘to perceive by touch’ and not from the extended physical meaning ‘to affect, physically’. Otherwise it will be implied that every metaphorical meaning needs to have an extended physical meaning counterpart. This is not true. The other metaphorical extensions in this sense (‘to deal with’ and ‘to reach’) do not have an extended physical meaning counterpart. Nevertheless, they can be accounted for by these property selection processes. The only difference lies in the properties selected for these meanings.

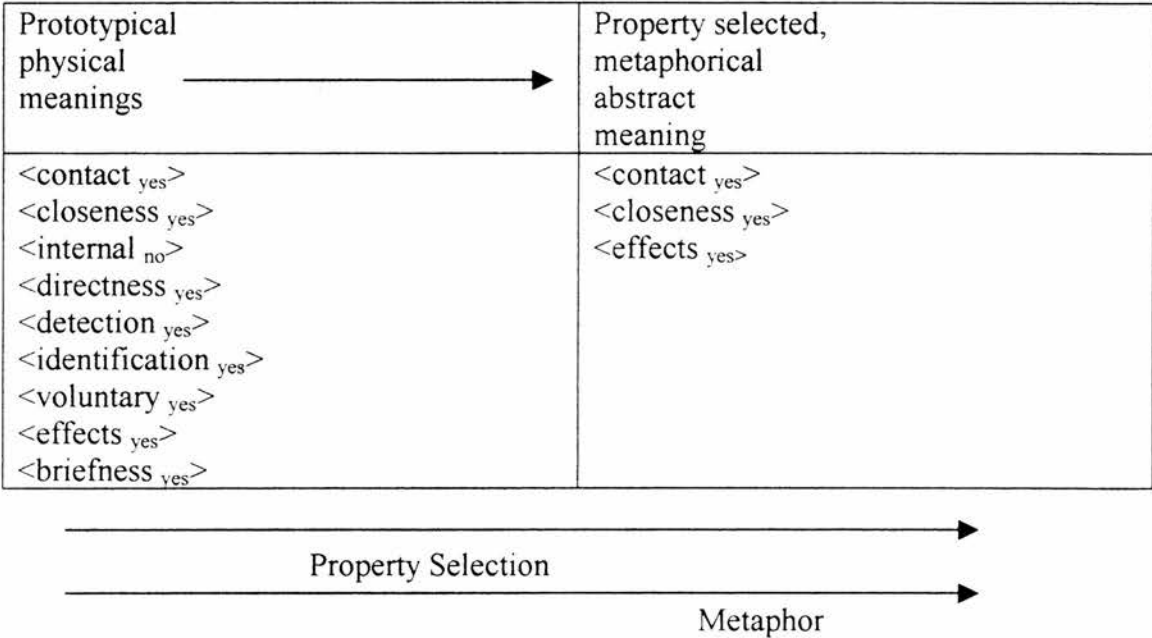


Figure 6.2: Property selection and metaphorical processes in (12) ‘to affect, non-physically’.

¹³³ As argued in Ibarretxe-Antuñano (1999c), in the case of touch the property <closeness_{yes}> should be understood as an entailment of the property <contact_{yes}>.

The properties that can explain the extended meaning ‘to deal with’ as in (13) are <contact_{yes}> and <closeness_{yes}>. In this example, the subject does not want to have any contact with ‘that business’, hence these two properties.

(13) I wouldn’t *touch* that business

The property <briefness_{yes}> can also be present in this meaning when it specifically refers to dealing with something superficially as in (14). This meaning is obtained not only by the meaning of the verb but also by the meaning conveyed in the adverb *barely* and the preposition *on* (see discussion in 2.3.3. above¹³⁴).

(14) He *barely touched* on the incident in his speech

The meaning ‘to reach’ in (15) selects the properties <contact_{yes}>, <closeness_{yes}> and <limits_{yes}>.

(15) He *touched* the high point in his career

The first property is selected because when the subject metaphorically reaches that status in his career, there is a metaphorical contact with that high point. This moment in this person’s career is an end-point, he cannot go any further, this is represented by the property <limits_{yes}>.

Finally, the other physical extended meaning in tactile verbs ‘to partake of food / drink’ illustrated in (16) selects the properties <contact_{yes}>, <closeness_{yes}>, because there is a physical contact between John and the food, and therefore, it implies that these two entities are near one another. It also selects the property <briefness_{yes}>, because John has not eaten much¹³⁵.

(16) John hardly *touched* the food

¹³⁴ Chapter 7 is devoted to the explanation of how the semantic content of different co-occurring lexical items takes part in the creation of the meaning of the sentence.

¹³⁵ As in the case of (14), it is argued that this property is also implied by the use of the adverb *hardly*. The issue of how other words in the sentence help identify which properties are selected is discussed in Chapter 7.

6.2.3. PROPERTY SELECTION PROCESSES IN SMELL

Two of the extended meanings of olfactory verbs are ‘to trail something’ and ‘to investigate’ illustrated below in (17) and (18). The properties selected in these meanings are <detection_{yes}> and <voluntary_{yes}>.

(17) The dog was *sniffing* the ground looking for the hare

(18) The police have been *sniffing* around here again

These meanings select the property <detection_{yes}> because the dog in (17) and the police in (18) are trying to detect those hints that would lead them to find what they are looking for. The property <voluntary_{yes}> is selected because this search is carried out consciously, both the dog and the police are active subjects of the action of smell. It is important to recall that the default value of this property in the sense of smell as explained in Section 5.2.1 (ii) is negative. This value is reversed in this meaning because the act of smell is no longer unconscious, but premeditated by the active subject. In Chapter 2, I discussed the differences between agential and non-agential subjects. Perception verbs were classified according to the semantic role of their subjects into three groups: ‘experience’ (the subject does not consciously control the stimuli; it refers to a state or inchoative achievement), ‘activity’ (unbounded process consciously controlled by a human agent), and ‘percept’ (subjects are the stimuli of the perception) (See Section 2.2). The property <voluntary> can be applied to these three groups. Experience and percept would have a negative value attached to this property, <voluntary_{no}>; activity like examples (17) and (18) in this discussion a positive value instead, <voluntary_{yes}>. The only difference in these two sentences is that in (17) the action of smell is a physical one, where the dog is actually using its nose in order to follow the trail left by the hare, whereas in (18), the police are not smelling physically, but metaphorically.

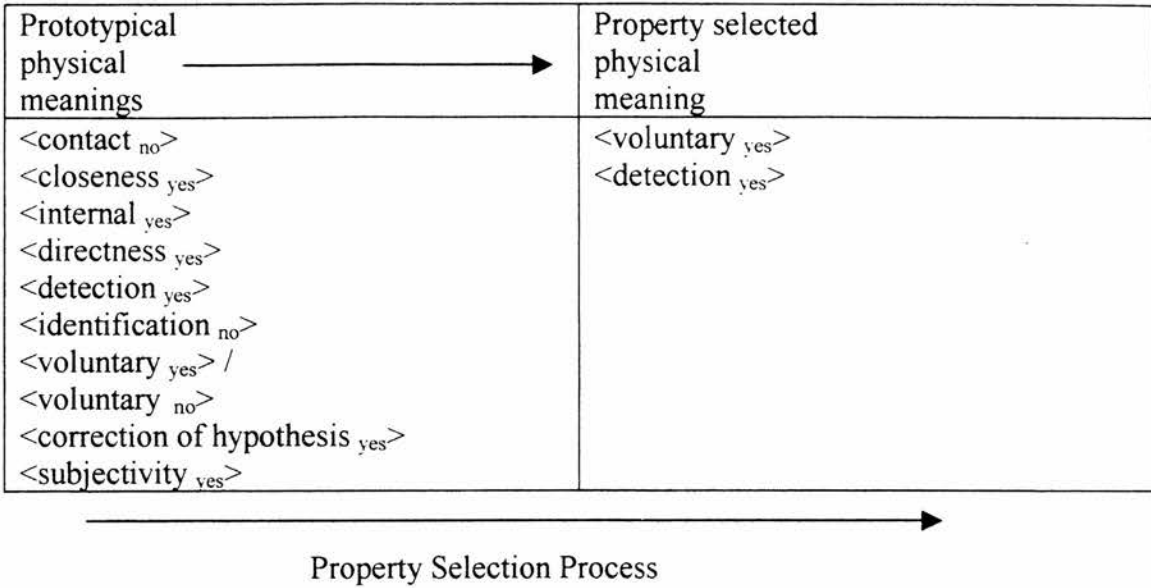


Figure 6.3: Property Selection Processes in (17) ‘to trail something’.

As in ‘to affect, physically’ in Section 6.2.2, in the case of the extended meaning in (17), only Property Selection Processes take part in the extension of this meaning. This selection of properties from the source domain onto the target domain not only shows what part of the source domain is transferred in this mapping, but it also explains the extension of meaning from the prototypical physical meaning ‘to smell physically’ to the extended physical meaning ‘to trail something’.

Property Selection Processes in (17) are represented in Figure 6.3 above.

However, in (18) ‘to investigate’ (cf. example (12) ‘to affect, non-physically’), not only Property Selection, but also metaphorical processes take place. That is why the meaning is no longer concrete but abstract. Both processes are represented in Figure 6.4.

As was pointed out in the discussion of ‘to affect’ in the previous section, it is important to take into account the fact that the extended metaphorical meaning ‘to investigate’ comes from the first prototypical meaning ‘to perceive by smell’ and not from the extended physical meaning ‘to trail something’. Otherwise it will be implied that every metaphorical meaning needs to have a physical counterpart. This assumption is wrong. Metaphorical extended meanings such as ‘to suspect’ and ‘to guess’ do not have an extended physical meaning counterpart. The only difference among these meanings lies in properties selected for these meanings.

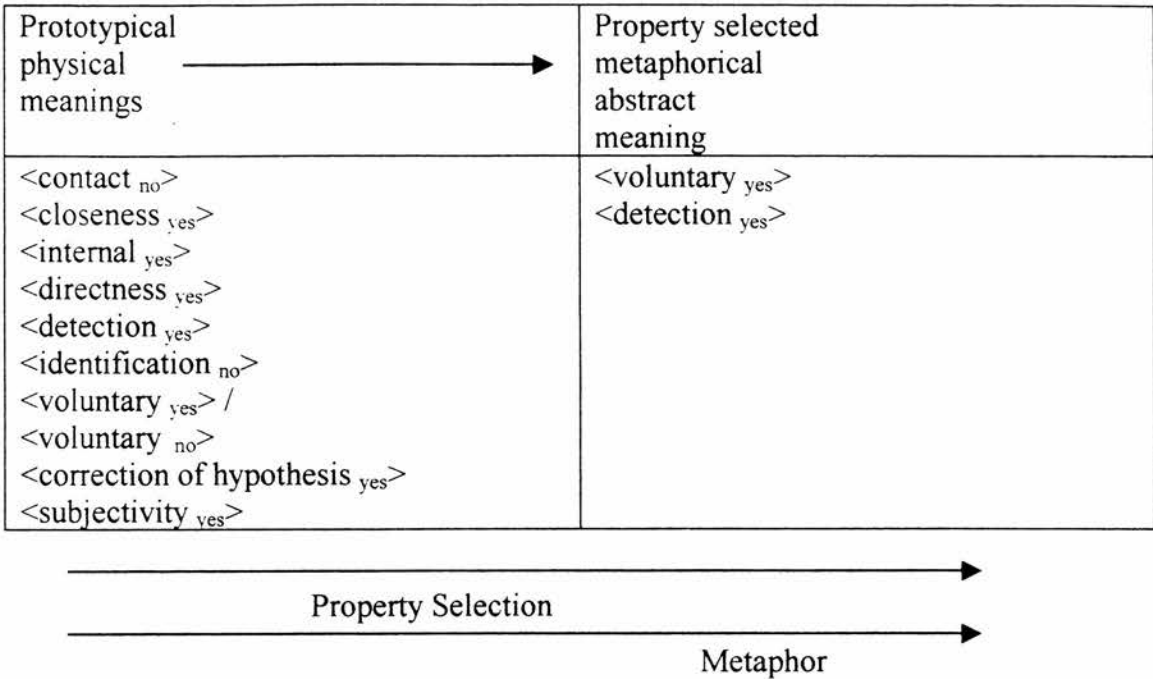


Figure 6.4: Property selection and metaphorical processes in (18) ‘to investigate’.

The properties that explain the extended meanings ‘to guess’ and ‘to suspect’ are <voluntary_{no}> and <detection_{yes}>. We do not consciously look for hints that would lead us to form a suspicion, as it was the case in ‘to investigate’, we detect that something happens, but we are passive perceivers of those hints that lead us to suspect. The property <identification_{no}> is also selected, because when we suspect something, all we know is that something is going on but we cannot tell for sure whether what we suspect is true or not. In these meanings, the 2nd order property <correction of hypothesis_{yes}> is also selected. As explained in Section 6.1.1, in the case of smell, the degree of reliability is less than in the other two senses, vision and hearing, where this property also applied. Consequently, the reliability of suspected events is less strong than the reliability of witnessed or heard events.

6.3. CONCLUSIONS

This chapter has explored the question of how linguistic expressions related to the sense modalities are created and constrained by the way human beings perceive and understand the five senses.

Based on two of the properties for the five sense modalities defined in Chapter 5, namely <correction of hypothesis> and <contact>, Section 6.1 has shown how these two properties constrain some of the possible semantic extensions in perception verbs.

Section 6.2 has focused on tactile and olfactory semantic extensions. This section has concentrated on metaphorical constraints. It has revised the ‘Invariance Principle’ (Lakoff 1993) and discussed the shortcomings of such a principle. As a solution, the processes called ‘Property Selection’ have been introduced. These processes are defined as “the selection of some of the properties from the set of prototypical properties that characterise the source domain in the target domain”. These processes show exactly what part of the source domain is used, not only in metaphorical meaning extensions, but also in physical extended meanings. They can be considered as a formalisation of what Lakoff and Johnson (1980) called the ‘used’ part of metaphor.

Figure 6.5 represents how these processes are applied to physical extended meanings. Figure 6.6 shows how these processes are applied to metaphorical extended meanings.

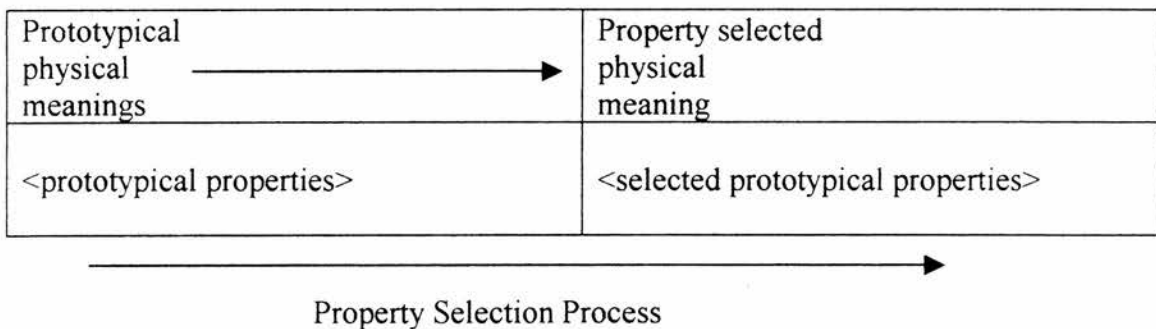


Figure 6.5: Property Selection Processes in extended physical meanings.

In the case of extended physical meanings, there is only one step taken. Through Property Selection Processes (PSPs), there is a selection of some properties from the source domain into the target domain, giving as a result the property selected physical meaning. In the case of metaphorical extensions, there are two steps taken. On the one hand, as in physical extended extensions, PSPs carry out the selection of some of the prototypical properties from one domain onto the other. On the other hand, metaphorical processes are also applied in order to convert the physical meaning to an abstract meaning, with the final result of a property selected, metaphorical abstract meaning.

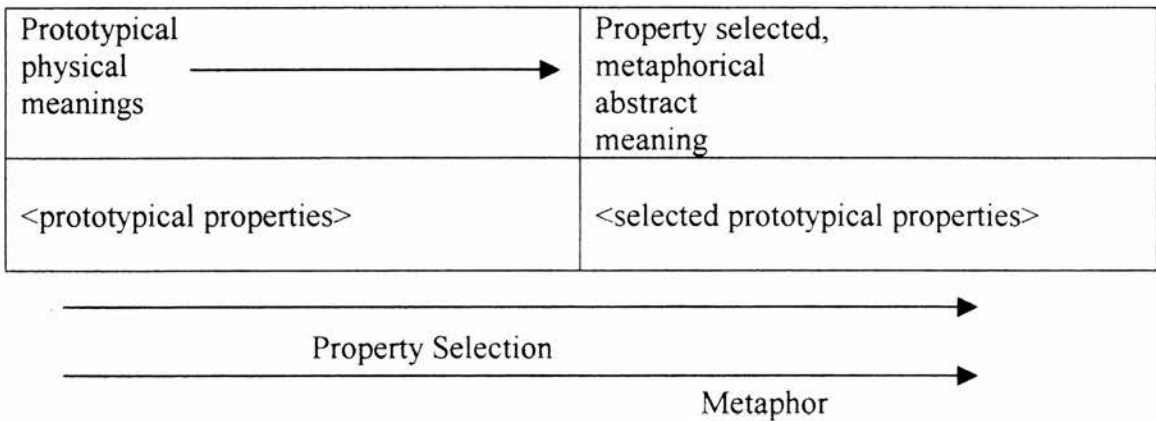


Figure 6.6: Property selection and metaphorical processes in metaphorical extended meanings.

These processes have been applied to the semantic fields of tactile and olfactory verbs. The properties selected in the extended meanings of these two senses are summarised in Table 6.2.

TOUCH	<selected properties>
'to partake of food'	<contact _{yes} >, <closeness _{yes} >, <briefness _{yes} >
'to affect'	<contact _{yes} >, <closeness _{yes} >, <effects _{yes} >
'to deal with'	<contact _{yes} >, <closeness _{yes} >
'to reach'	<contact _{yes} >, <closeness _{yes} >, <limits _{yes} >
SMELL	
'to trail something'	<detection _{yes} >, <voluntary _{yes} >
'to investigate'	<detection _{yes} >, <voluntary _{yes} >
'to guess'	<detection _{yes} >, <identification _{no} >, <voluntary _{no} >, <cor. hyp. _{yes} >
'to suspect'	<detection _{yes} >, <identification _{no} >, <voluntary _{no} >, <cor. hyp. _{yes} >

Table 6.2: Selected properties in touch and smell.

In this Chapter, two of the main research questions in this thesis have been discussed: how to account for extended physical meanings and how to constrain metaphor. Chapter 7 takes up the issue of polysemy and discusses it in relation with the extended meanings of tactile and olfactory verbs as well. It will be argued that the polysemous senses in these verbs are obtained by the interaction of these verbs with the different elements they co-occur with. The role that these elements and these verbs play in the overall meaning of the sentence is not the same, but varies in every semantic extension. This will be called 'Graduable Polysemy'. It will also be argued that although semantic extensions are cross-linguistic, the way in which they are obtained is language specific.

CHAPTER 7: CONSTRAINTS ON POLYSEMY

A word is understood as polysemous if all its multiple meanings are systematically related. The relation between the different polysemous senses of a word is not whimsical and random, but motivated. This motivation finds its grounds in our understanding and bodily experience of the world in which we live.

In Chapter 5, I have presented what the bodily basis is for the semantic extensions in the field of sense perception. This bodily basis is characterised in terms of ‘prototypical properties’. These properties characterise the source domain of sense perception. Based on this typology of properties, in Chapter 6, it has been shown how extended meanings derived from the source domain of physical perception, both physical and metaphorical, are constrained by the selection of only part of the properties in the source domain. Focusing on the polysemous meanings of two sense perception verbs, *touch* and *smell*, the Property Selection processes have been able to describe exactly what it is that relates these extended meanings to each other and to their common source domain.

By now, it is clear that the relation between these senses is motivated. However, there is still a question put forward in Chapter 4 that needs to be tackled. All these different extended meanings are considered polysemous senses of these perception verbs, but as already argued in Section 4.1.2, it seems that many of these meanings are only possible if the perception verb is used in conjunction with a specific subject, complement, and / or adjunct.

For instance, in sentence (1) it is possible to infer the meaning ‘to partake of food’, not only because of the verb *touch*, but also because the direct complement is *the food*, whose restricted role would be to be eaten, and because of the adjunct *hardly*, that denotes that the subject John did not touch the food much.

(1) John hardly *touch*ed the food

In this Chapter, I take up this issue of polysemy and discuss it in relation with the extended meanings of tactile and olfactory verbs. In Section 7.1, I set out the problems that have arisen from previous studies on polysemy. In Subsection 7.1.1,

taking as a starting point Brugman's analysis of the preposition *over*, I extend the discussion of the main problems stemming from such cognitive analyses, already introduced in Chapter 4. I show how polysemous senses are obtained by the interaction between the semantics of the rest of the elements in the sentence. Section 7.1.2 focuses on cross-linguistic polysemy, that is to say how the same meanings are expressed in English, Basque and Spanish. In Section 7.2, I discuss these problems in relation to tactile and olfactory verbs and propose an alternative account for these problems. In Section 7.3, I explore the implications of this alternative account and its repercussions for the universality of polysemy. Finally, in Section 7.4, I draw some conclusions.

7.1. INTRODUCTION

7.1.1. BRUGMAN'S ANALYSIS OF OVER.

Well-known studies in Cognitive Linguistics have assumed that the polysemous senses are carried by single lexical items, without taking into account the semantics of the other elements of the sentence where those lexical items occur. Brugman's analysis of the preposition *over* is an example of such an assumption, i.e. the spatial relational meaning is contained only in the preposition (*over*) itself (Brugman 1981; Lakoff 1987: case study 2).

In her study, Brugman describes all the senses of *over* and the relations among them. She finds that the central meaning of this preposition is one that combines elements of both *above* and *across*. Other senses such as the 'above' sense, the 'covering' sense, and so on are also identified; but for this discussion, I concentrate on the 'above-across' sense and some of its variants. The prototypical 'above-across' meaning is exemplified in (2).

- (2) The plane flew *over*

In (2) the plane is understood as a trajector (TR) that is oriented relative to an unspecified landmark¹³⁶ (LM). Both TR and LM are generalisations of the concepts figure and ground (Langacker 1987). This sentence is represented in Figure 7.1.

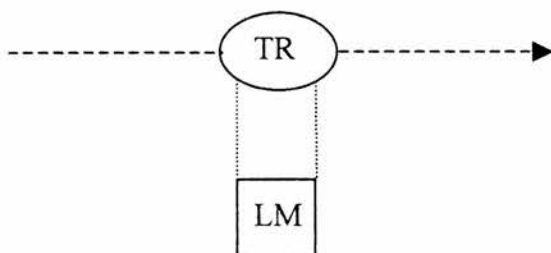


Figure 7.1: Schema 1.NC.

The path is above the LM and goes all the way across the LM from the boundary on one side to the boundary on the other. A dotted line represents the boundaries of the LM. There is no contact between the LM and the TR in this case.

A special case of (2) is sentence (3).

(3) The bird flew *over* the yard

The same schema 1 applies to this sentence, but in this case more information specifying the nature of the LM is added. This is represented in Figure 7.2.

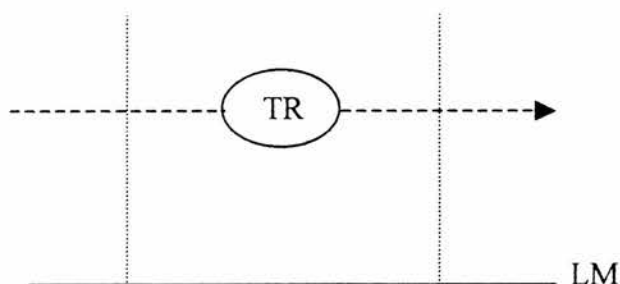


Figure 7.2: Schema 1.X.NC

In (2), the yard is the LM and the bird is the TR. This LM is ‘extended’, i.e. when “the landmark extends over a distance or area” (Lakoff 1987: 420). This information is abbreviated with an ‘X’ in the schema. As it was the case in (2), there

¹³⁶ The ‘trajector’ is the figure or the most prominent element in any relational structure. The ‘landmark’ is the other entity in the relation.

is no contact between the TR and the LM either in this sentence. This is abbreviated with an ‘NC’ in the schema.

Sentence (4) is another variation of sentence (2), represented in Figure 7.3.

- (4) Sam climbed *over* the wall

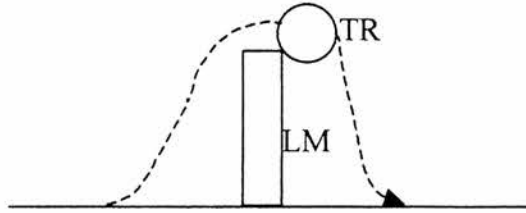


Figure 7.3: Schema 1.V.C

In this sentence, the LM is the wall and the TR is Sam. There are new pieces of information in (4) different from the prototypical senses exemplified in (2). The LM is ‘vertical’; that is to say, the wall is in an upward position. A ‘V’ represents this. Unlike in (2) and (3), where TR and LM did not have contact, in this case the TR Sam touches the LM the wall in the process of climbing. There is contact between the TR and the LM. A ‘C’ represents this.

Finally another variation of sentence (2) is example (5) illustrated in Figure 7.4.

- (5) Sausalito is *over* the bridge

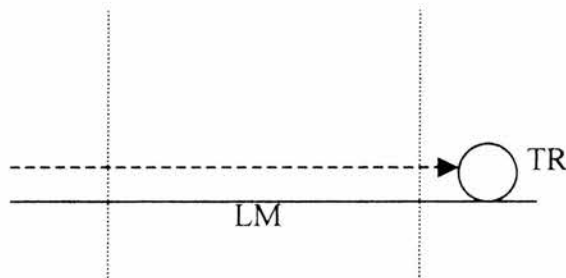


Figure 7.4: Schema 1.X.C.E

In (5), the LM is the bridge and the TR is Sausalito. The LM is extended, there is contact between the TR and the LM, and there is also a focus on the end point of the path, abbreviated by an ‘E’. *Over* has the sense of ‘on the other side of’.

These are just four different examples taken from Brugman’s analysis of the preposition *over*. According to this author, the central sense of the preposition *over*¹³⁷, ‘above-across’ has different variants depending on the contact or no contact between the LM and TR, on the position and extension of the LM and on the endpoint focus. However, not all these extra bits of information are contained in the preposition itself, but on the other elements of the sentence. For instance, the fact that in some cases *over* implies contact is not inferred from the preposition but from the verb used. In (4), the information provided by the verb, *climbed*, automatically entails that there is a contact between the subject *Sam* – the TR –, and *the wall* – the LM –, because it is impossible to climb a wall without touching it. In a similar way, the no-contact characteristic of *over* in (2) and (3) is also implied in the verb *flew*. In most cases, when we say that something is flying, we visualise the flying object (bird, plane...) as not touching any surface (see Figure 7.2). In (4), the additional information that the LM is vertical, is not only provided by the LM – *the wall* – itself, but also implied by the verb *climbed*, which implies an upward movement by default. Even in the case of end-point focus, where it is claimed that this meaning is not added by anything in the sentence, but “the result of a general process that applies in many, but not all English prepositions” (Lakoff 1987: 424), the other members of the sentence contribute to this meaning. Without the static verb *to be*, implying that there is no movement, and *the bridge* (a structure with a beginning and an end), the end-point focus could not be inferred.

All the meanings analysed in this section belong to the central meaning ‘above-across’; the same comments can be made about the other meanings assigned to *over*. For instance, *over* in a sentence like (6) belongs to the so-called ‘excess schema’. Although it is true that without the preposition *over*, it could not be understood that the river was carrying much more water than its banks could allow, it

¹³⁷ See Boers (1996) and Ibarretxe-Antuñano and Serratrice (m.s), for a discussion on the central sense of *over*.

is equally true that without the verb *to flow* and the NP *the river*, this meaning cannot be inferred.

(6) The river *overflowed*

The same ‘excess’ meaning can be inferred from other sentences as well. For example, sentence (7).

(7) ? The table *overflowed*

In (7), the word *river* is substituted by the word *table*. At first sight, this sentence may sound a little bit odd. In the case of *river*, it is assumed that a river carries water, and metonymically understood that the excess of water in the river was what caused the flood. In (7), this process is not so obvious and that is why this sentence can be considered awkward as it stands. There are two ways in which this sentence can be turned into a felicitous sentence.

On the one hand, if we take into consideration the context in which this sentence has been uttered. Imagine, for example, that we are at a reception where there is plenty of food and drink. We did not expect so much because we were told that we were going to be given just a light snack. When we report to somebody else how the reception was, we say (7). In this case, the hearer would not have problems in understanding what we mean by saying *the table overflowed*. On the other hand, we can add more information to the sentence itself, for example, a prepositional phrase like *with food* as in (8).

(8) The table *overflowed* with food

The first solution is of a pragmatic character. We rely on the external contextual information to solve the failure in the understanding process. The second solution is of a semantic character. We have solved the problem by adding a new overt element to the sentence. The semantic content of this new element has contributed to the understanding of the sentence itself.

In this Chapter, I will not deal with pragmatic contextual information, but will focus on the role that the semantic content of the different overt elements that co-occur in a sentence play in the overall meaning of the sentence.

Based on these examples, it can be argued that the polysemy in the preposition *over* is not only obtained by the semantic content of this preposition, but also in conjunction with the semantic content of the words that accompany this preposition in the sentence where it occurs. Sinha and Kuteva (1995) have reached a similar conclusion when analysing spatial relational meaning in locative particles. As is the case with *over*, the meaning of locative particles is strongly dependent on the meanings of items co-present in the same syntagm¹³⁸. These authors claim that “the spatial relational meaning is not mapped exclusively to the locative particle, but is distributed over the other elements in the syntagm as well” (1995: 170)¹³⁹.

In this subsection, all the examples are drawn from one language, English. It has been shown how polysemy is not always localised on one single word, but that the other elements of the sentence also contribute to build up that meaning. This fact becomes even more obvious if we examine cross-linguistic polysemy; that is to say, if we examine how different languages that share the same mappings between different domains – the same polysemous senses – express such meanings. Cross-linguistic polysemy is introduced in the next subsection.

7.1.2. CROSS-LINGUISTIC POLYSEMY

In the previous section, it has been argued that polysemous senses are not the result of the meaning of a single lexical item alone, but the result of the interaction of such a lexical item with the other elements in the sentence.

This is of special importance when we examine cross-linguistic polysemy. Different languages express the same concept in different ways, with different elements. For example, if we look at motion verbs in English, like *to go up*, *to go down* and so on, we notice that in order to express the concept of upwards motion, it is necessary to use the verb *go* in conjunction to the preposition *up*. Other languages, however, use a different strategy to convey this meaning.

¹³⁸ Miller and Johnson-Laird (1976) also notice this contextual dependence of locative particles. (For a different argument see Landau and Jackendoff 1993).

¹³⁹ This proposal called ‘Distributed Spatial Semantics’ is supported by data coming from language acquisition studies such as Sinha *et al.* (1994), Thorseng (1997). See also Sinha and Thorseng (1995) for a coding system for spatial relational reference.

In the context of some people waiting for the lift, English speakers could say the following sentences.

(9) -*Going up?*

-Yes, I'm going to the third floor

Spanish speakers and Basque speakers in the same situation would say (10) and (11) instead.

(10) -¿*Subes?*

go.up.2SG:PRES

'Going up?'

-Sí, voy al tercer piso

yes go.1SG:PRES to.the third floor

'Yes, I'm going to the third floor'

(11) -*Gora?*

up.ALL

'Going up?'

-Bai, hirugarren pisura noa

yes third floor.ALL go.1SG:PRES

'Yes, I'm going to the third floor'

In (10), the Spanish speaker expresses the same concept of upward movement by only using the verb *subir* 'to go up'. In (11), the Basque speaker uses the adverb *gora*¹⁴⁰ 'upward' in the same case.

The differences in the use of motion verbs cross-linguistically have been the object of a great deal of research. Stylistic studies such as Vinay and Darbelnet (1975 [1995]) already pointed out these divergences between English and French. More

¹⁴⁰ *Gora* is formed by the adjective *goi* 'high' and the allative case marker *-ra*. Sentence (9) can be alternatively expressed by a single verb like in Spanish with the verb *igo* 'to go up' and by the adverb *gora* accompanied by the verb *joan* 'to go'.

recently and in the Cognitive Linguistics framework, Talmy's 'event-frames' theory (1985, 1991, 1996) proposes a more unified way of accounting for these typological differences.

Talmy assumes that it is possible to isolate elements separately within the domain of meaning and within the domain of surface expression (verb, adposition...) and satellites ("certain immediate constituents of a verb root other than inflections, auxiliaries, or nominal arguments" (1985: 102)). The association between semantic elements and surface elements is not a one-to-one relationship. A combination of semantic elements can be expressed by a single surface element or vice versa. Or semantic elements of different types can be expressed by the same type of surface element, as well as the same type by several different ones (1985: 57). This varies across languages. Talmy classifies languages into two typological groups: (i) 'verb-framed' languages, those that "characteristically mapped the core schema¹⁴¹ into the verb" and (ii) 'satellite-framed' languages, those that "map the core schema onto the satellite" (Talmy 1991: 486). The examples discussed above belong to what Talmy calls the 'motion event'. A motion event is "a situation containing movement or the maintenance of a stationary location" (1985: 60). A motion event consists of several semantic components: the 'Figure' (F) – the moving or conceptually movable object whose path or site is at issue –, the 'Ground' (G) – a reference-frame, or a reference – point stationary within a reference-frame, with respect to which the figure's path or site is characterised –, the 'Path' (P) – the course followed or site occupied by the F object with respect to the G object –, and the 'Motion' (M) – the presence *per se* in the event of motion or location (Talmy 1985: 61).

According to Talmy's approach¹⁴², English is a satellite-framed language, because a satellite to the verb, the preposition *up*, conveys the core information of the

¹⁴¹ The 'core schema' is "the schematic core of a framing event". A 'frame event' is in turn, the event that "has the character of delineating a certain type of schematic structure in any particular set of organised conceptual domains" (Talmy 1991: 482).

¹⁴² Although Basque is not included among the languages analysed by Talmy, it seems that it might be included among the satellite-framed languages. However, more research into this aspect is needed in order to support this statement.

path of movement, whereas Spanish is a verb-framed language because it is the verb itself, *subir* ‘to ascend’, that conveys that information¹⁴³.

The same structures in (9), (10), and (11) can convey metaphorical meanings. Sentences (12), (13) and (14) are examples of Lakoff and Johnson’s orientational¹⁴⁴ metaphor MORE IS UP. According to these authors, the physical basis of this metaphor is our experience of the fact that when we add more of a substance or of physical objects to a container, the level goes up.

(12) The number of books printed each year keeps *going up* (Lakoff and Johnson (1980: 15)).

(13) El número de libros publicados cada año
sigue *subiendo*
the number of books published each year
keeps going up
‘The number of books printed each year keeps going up’

(14) Urtero argitaratako liburuen kopuruak *goraka*
jarraitzen du
year each published.ADN book.GEN number.ERG up
keep.HAB aux
‘The number of books published each year keeps going up’

As seen in the examples, this metaphorical mapping is not only found in English, but also in Spanish (13) and Basque (14). What is different between these languages is the overt syntactical representation of such metaphorical meaning. As is the case in the physical examples above, in English it is necessary to use the verb *go* followed by the preposition *up*, in Spanish the verb *subir* covers this meaning and in Basque, the adverb *goraka*¹⁴⁵.

¹⁴³ See Aske (1989) and Slobin (1996) for a more detailed discussion of the ‘motion event’ in English and Spanish.

¹⁴⁴ An ‘orientational’ metaphor “organises a whole system of concepts with respect to one another” (Lakoff and Johnson 1980:14). These metaphors are usually related with spatial orientation: up-down, in-out, front-back, on-off, deep-shallow, central-peripheral.

¹⁴⁵ *Goraka* is formed by *gora* ‘upwards’ and the suffix *-ka*. This suffix denotes a repetitive action.

7.1.3. SUMMARY

In this section, two main ideas are put forward; on the one hand, that polysemous senses are the result of the interaction of the meaning of the different parts of a sentence; and on the other, that although the same meanings are expressed in different languages, the way in which these different languages convey such meanings can be different.

In the following section, I take up these ideas and apply them to the different semantic extensions of tactile and olfactory verbs. It will be argued that the compositionality of meaning is not the same in all cases, but hierarchically organised according to which element of the sentence – that is, the semantic content of which element – exercises a major influence in the overall meaning. Although the same semantic structures are possible in the three languages under investigation, the way in which these languages express such meanings is different.

7.2. TACTILE AND OLFACTORY POLYSEMY: AN ALTERNATIVE APPROACH.

As was shown in Chapter 2, tactile and olfactory verbs can convey a wide range of physical and metaphorical extended meanings. These verbs are polysemous, but the issue here is to address the question of what causes this polysemy and how we can account for it. In Section 7.1, it is argued that previous cognitive analyses of polysemy in prepositions do not take into account the semantics of the other elements in the syntagm in which the preposition appears. It is shown that without these other elements it is not possible to infer such meanings.

As a possible solution to this problem, Pustejovsky's compositional approach to polysemy was introduced in Chapter 4. The main thesis of Pustejovsky's Generative Lexicon is that a core set of word senses is used to generate a larger set of word senses when individual lexical items are combined with others into phrases and clauses. After applying this model to some of the semantic extensions in tactile verbs, it was concluded that although Pustejovsky's model seems to account for some of the main central physical meanings of this semantic field, it fails to constrain

how and why metaphorical expressions take place, because it allows the formation of infelicitous sentences (see Section 4.2.).

In sum, we need an approach that takes into account the role that the semantics of the different elements in a sentence plays in the overall meaning of that sentence, but at the same time constrains what elements can be put together in order to obtain such meaning. It is to this alternative approach that we turn now.

7.2.1. GRADUABLE POLYSEMY

In Section 7.1, it has been argued that all the elements in a sentence take part in the overall meaning of the sentence itself. The same statement can be made about the semantic extensions of tactile¹⁴⁶ and olfactory verbs. Below there are some examples of such extensions in English.

(15) John hardly touched the food

(16) The dog was sniffing around looking for the hare

As has already been discussed in this thesis several times, the meaning of (15) is inferred not only because of the verb *touch*, but also because of the direct complement *the food* and the adjunct *hardly*. It would be impossible to infer a meaning like ‘to partake of food’ without having a complement that denotes some kind of edible object. Therefore, it is possible to predict that whenever the complement of the verb *to touch* refers to an edible object, then the meaning is ‘to partake of food’.

The meaning in (16) is ‘to trail something’. This meaning is inferred not just because of the verb *to sniff*, but also because the subject of the sentence is *the dog*, an animal known for its accurate and sharp sense of smell; the preposition *around* that gives us the information that there is not a certain point where the dog is smelling, but a vague area, and the fact that the action of sniffing has a purpose, i.e. to look for the hare. We also know that animals, as well as people, leave a distinctive trail that can be easily followed by dogs.

¹⁴⁶ See Ibarretxe-Antuñano (1999d) for an initial approach to polysemy in tactile verbs.

If we substitute *around* for other prepositions such as *out* and *at*, the meaning of the sentence changes completely.

(17) The dog *sniffed* out the hare

In (17), the preposition *out* changes the meaning of the sentence completely. (17) does not mean that the dog is following the trail left behind by the hare, but that the dog has already discovered where the hare was. Although I am not going to focus on this issue in this thesis, it is worth noticing that in order to obtain this meaning, it has been necessary to change the verb phrase in (17). ‘To trail something’ is an activity and as such, it requires the aspect of the VP to be progressive. ‘To discover’, however, is an achievement and requires a non-progressive duration of action instead (**The dog was sniffing out the hare*).

The same conclusions can be reached if we use the preposition *at* as in (18).

(18) The dog was *sniffing* at the hare

In (18), the preposition *at* cancels the sense of vagueness inferred by *around*. In this case, *at* points towards a very specific area of action, what the dog is sniffing is a very definite entity, the hare. At the same time, it is important to point out that the meaning of the sentence shifts from the extended physical of ‘to follow a trail’ to the prototypical physical meaning of ‘to smell (activity)’.

This change is even more dramatic if, instead of the physical extended meaning ‘to follow a trail’, we change the preposition in the metaphorical extended meaning ‘to investigate’ illustrated in (19).

(19) The police have been *sniffing* around this place

In this example, the subject *the police* helps to obtain the meaning ‘to investigate’, as it is commonly assumed that one of the main activities of the police is obviously to investigate cases, looking for evidence, and so on. The preposition *around* tells us that the police have been investigating in this area. They have not gone to a specific place in particular, but covered a whole area.

However, if we change *around* for *at* as in (20), the reading we obtain is very different.

(20) The police have been *sniffing* at this place

The preposition *at*, as in sentence (18), narrows down the area of activity of the police. Now it is not a whole area where they have been investigating but a very specific spot. But what is more, the meaning of (20) changes from being an extended metaphorical meaning – ‘to investigate’ –, to the prototypical physical meaning of ‘to smell (activity)’.

In all these examples, it would be impossible to infer such meanings without the specific use of these elements. The situation is somehow different in the following examples.

- (21) Who *touched* my clothes?
- (22) An appeal that *touches* us all
- (23) He *touched* the highest point in his career
- (24) Mary can *smell* danger from miles away

In (21), the extended meaning is ‘to affect’. Somebody has changed the state in which the clothes were and we want to know who that person is. In order to infer this meaning we need an entity that is able to carry the action of touching, as well as an entity that can be touched by the subject. Unlike in (19) and (20), the choice of both subject and complement is very wide; there are many entities that can carry out both tasks. The obtaining of this meaning does not depend upon such a restrictive choice of arguments.

The same statement can be made about the other two sentences. The meaning in (22) is also ‘to affect’, but metaphorically. *An appeal* is an entity that can have an effect on us, it is not a concrete entity and therefore the meaning inferred cannot be physical, but metaphorical. Therefore, the choice of this kind of abstract subject does have a consequence in the meaning in this sentence. But, as in (21), there are many abstract entities that can fill this position (*a situation, a reaction*) resulting in the same extended meaning of ‘affect’, so the choice of subject is not as restrictive as before.

In (23), the meaning is ‘to reach’. In this case, the fact that an end-point is implied is not only conveyed by the nature of the tactile verb itself, but also by the

complement *the highest point* that denotes a limit to that metaphorical action of touching. And since *the highest point* is without dimension, we get the achievement reading of ‘to reach’. As in the other examples, there are many other entities like *bottom*, *eternity* that can be placed in this position.

Finally, the meaning in (24) is ‘to guess, to sense something’. This is also a metaphorical extension, the object *trouble* is an abstract entity, and therefore cannot be physically smelt as a flower can. Here again, there is a great deal of other entities that can be placed in this position (*business*, *money*), and therefore, the choice of complement is very wide.

In these four examples, the semantics of the other elements of the sentence plays a role in the overall meaning, but the importance of these elements is not as big as in the previous examples, (19) and (20). In order to obtain the meanings ‘to affect’, ‘to reach’, and ‘to guess’, it is necessary to have subjects that are able to touch and smell, and complements that can be touched and smelt. The achievement of that meaning, however, is not as dependent on these arguments as in (19) and (20). In (21), (22), (23), and (24) the intrinsic meaning of the verb itself plays a much more important role, than that of its arguments.

Finally, we have sentence (25) with the meaning ‘to affect’.

(25) John *touched* Mary

As argued in Section 4.2.1, this sentence is highly ambiguous; there are simultaneous interpretations of this sentence. (25) can infer a physical contact between *John* and *Mary*, i.e. the prototypical meaning of *touch*; the meaning ‘to affect, physically’ as in a situation where John is not expected by Mary and when he touches her, he makes her shiver; and the meaning ‘to affect, metaphorically’, in which case an emotional reaction from Mary is implied. Without any more information about the context in which this sentence is uttered, one cannot decide whether (25) should be interpreted physically or metaphorically.

Unlike the other examples, (25) cannot be predicted by the semantic properties of the arguments that the verb takes. *John* and *Mary* are too vague to constrain the semantic extension that takes place in this example. In the case of the meaning ‘to partake of food’, the complement *the food* constrains the semantic

extension of the verb, because there are not too many things that can be done with food, apart from eating, cooking... With *John* and *Mary* the case is different, the possibilities for these two entities are infinite. And yet, the meanings that we have are the prototypical meaning, and ‘to affect’, both physically and metaphorically.

In sum, based on these sets of examples, we can divide these polysemous senses into two groups. On the one hand, examples like (25), where it is not possible to predict what the interpretation is by means of the choice of arguments – these are called ‘**unpredictable**’ cases of polysemy; and on the other, those cases where the choice of arguments leads to a specific predicted extension of meaning. This latter group is further classified depending on the degree of influence of the semantics of the arguments involved. Where meanings such as ‘to partake of food’ and ‘to trail something’ are mainly determined by the arguments and other elements in the sentence, in other meanings like ‘to affect’, ‘to reach’, and ‘to guess’, it is the verb that mainly governs the choice of arguments and meaning. The former cases are called ‘**argument-driven extensions**’ and the latter, ‘**verb-driven extensions**’. The fact that the weight of the semantics of the different elements in the overall meaning of a sentence is not the same in all extended meanings, but hierarchically organised according to the degree of influence of the lexical items involved, is what I call ‘**gradable polysemy**’.

In this section, I have shown that extended meanings are obtained by the interaction of the semantic content of both the perception verb and its complements. The role of the semantics of both the perception verb and its complements is not the same in all extended meanings; in some cases, the verb is more important and in some other cases, the complements are. If the semantic content of the complements of these perception verbs is so crucial in some of the extended meanings found in this semantic field, the next question that arises is whether or not these complements are required to have a very specific semantic content in order to obtain that specific extended meaning. Whether or not the choice of these complements is constrained by the characteristics of this semantic field of perception. It is to this issue that I turn now.

7.2.2. VERB-PROPERTY REQUIREMENT

In the previous section, the concept of graduable polysemy has been introduced. According to the degree of influence in the overall meaning of the sentence that the semantic content of the perception verb and the other elements of the sentence had, semantic extensions were classified as (i) unpredictable polysemy, (ii) verb-driven extensions, and (iii) argument-driven extensions.

In this thesis, it has been argued that different conceptual domains are not linked as a result of chance. In Chapter 6, it is shown that the different semantic extensions that take place in perception verbs are constrained by and based on the physiology of these senses, as well as on our perception of these senses themselves. In other words, there is a bodily-based motivation for extending the meaning of one conceptual domain into another different one.

If this constraint is correct, then it follows that all those elements that contribute to the extension of meaning must also be constrained in a similar way. I have argued in Section 7.2.1 that polysemous meanings are not just contained in a particular tactile or olfactory verb in every extension of meaning. In predictable cases of polysemy, the other co-occurring elements contribute with their own semantic content to the configuration of the polysemous sense. Therefore, these elements that play a more or less crucial role in the creation of the polysemous meanings are required to follow the same bodily-based motivation. A motivation, that as shown in Chapter 5, is characterised in terms of properties.

This requirement will constrain the choice of elements in two different ways. On the one hand, it will explain why certain elements cannot co-occur with certain verbs in particular, why sentences like (26) and (27) below are ruled out. On the other hand, it will show how some properties that characterise these perceptual processes are highlighted by the semantic content of these elements themselves. I call this requirement on the choice of co-occurring elements in extended meanings the ‘**verb-property requirement**’.

Firstly, let us focus on the first issue: why these sentences below are not accepted.

- (26) *John *touched* the joke

(27) *John *smelt* the highest point in his career

Without any more contextual information¹⁴⁷, both (26) and (27) are not felicitous. In (26), the reason why this is so lies in the fact that *the joke* does not seem to be taken as a ‘touchable’ type of concept. In other words, a joke cannot be touched in any physical way as objects like *the table*, *the clothes* can; but it can neither be touched in any abstract possible way as other concepts like *the topic*, *the highest point* can. The same statement can be made about (27). Whereas concepts such as *the joke*, *danger* and so on seem to be licensed in this situation, *the highest point* is rejected, it does not seem to be a ‘smellable’ type of concept, either physically (a point does not give off any smell) or metaphorically.

To say that these complements are not ‘touchable’ or ‘smellable’ types of concepts means that these complements do not seem to share the same properties that these two perceptual processes have. The properties that characterise these complements, their semantic content, seem to clash with some of the properties that characterised these verbs:

For instance, the complement *the highest point* in (27) clashes with some of the properties of the verb *smell*. A characteristic of this sense is the property <identification_{no}>. This property refers to the fact that it is very difficult to identify what the stimuli for smell are. With the sense of smell, it is possible to detect the stimuli, but when it comes to identifying what the smell is, the sense of smell is not as accurate as the other senses (see also Section 6.1.1.). The complement in this sentence implies a very specific entity: it is a point situated at the very top of something; and therefore, it clashes with one of the properties required by the sense of smell. In other words, this complement is not ‘smellable’, and therefore, it violates the ‘verb-property requirement’.

A similar explanation can be given for (26). *The joke*, as it stands in this example (see footnote 147), clashes with the perceptual requirements of the tactile verb. In this sense, <contact_{yes}> is one of its properties, i.e. the PR must have a

¹⁴⁷ As pointed out in Ibarretxe-Antuñano (1999d: 210), (26) could be accepted if used negatively and in a very specific context. For instance, if we say *Don't touch that joke when you make your speech before the committee*. However, if this example is analysed internally, i.e. without any context, then it is no longer possible.

physical contact with the OP in order to be perceived¹⁴⁸. However, it does not seem to be possible to establish any kind of physical or metaphorical contact between the P, John, and the OP, the joke. The joke is too vague¹⁴⁹ as an entity to be able to be touched, and therefore, it clashes with the property <contact_{yes}>.

Therefore, it is argued that these sentences are infelicitous because the properties that characterise each of these senses clash with the possible properties that these concepts have. In other words, they do not abide by the ‘verb-property requirement’, because the properties of the different elements that are put together in a sentence violate the properties that constitute the bodily basis of these sense perception verbs.

The second part of the ‘verb-property requirement’ deals with the way in which some properties that characterised these perceptual processes are highlighted by the semantic content of these elements.

Sentence (28) is an example of the argument-driven semantic extension ‘to partake of food’ in tactile verbs.

(28) John hardly touched the food

As was explained in Section 7.2.1, this meaning is inferred not only because of the verb *touch*, but also because of the direct complement *the food* and the adjunct *hardly*. What led this extended meaning to be classified as argument driven is the fact that without either of these two elements it would not be possible to obtain this meaning in particular. Now we need to recall the properties selected in this meaning in Chapter 6; these properties are <contact_{yes}>, <closeness_{yes}> and <briefness_{yes}>. In this example, the property <briefness_{yes}> is being highlighted by the adjunct *hardly*, which refers to a ‘small quantity of something’. In fact, if we remove this adverb from the sentence, the extended meaning of ‘partake’ disappears completely,

¹⁴⁸ It is important to bear in mind that the physical property <contact_{yes}> is no longer understood as ‘physical’ in abstract meanings because in these cases there is no physical contact required. For instance, it is possible to say sentences like *Her attitude touched me* even though you have only read about it, and even if she is far away from you (Barcelona p.c.). What exists and must be present in the metaphorical cases is an abstract counterpart of <contact>.

¹⁴⁹ It is important to recall here the way in which the OP was represented in Figures 5.3 and 5.5 in Section 5.2.3. The OP in smell was a discontinuous line square, and the OP in touch was a continuous line instead. These lines represented the way in which perception was carried out through these senses, as well as the nature of those OPs. Whereas in smell, the boundaries of the OP are vague, not well defined, in touch, the boundaries of the OP are

and the sentence *John touched the food* comes to infer the prototypical physical meaning of touch as an activity verb¹⁵⁰.

In verb-driven semantic extensions, it is also possible to observe how some of the properties selected are distributed or highlighted by the different elements that co-occur in the sentence. For example, in (29) *at Tenerife* highlights one of the properties that is selected in the extended meaning ‘to reach’, the property <limits_{yes}>, that refers to the fact that the ship has reached her end-point, the ship has arrived at her destination, i.e. Tenerife.

(29) The ship *touched* at Tenerife

An interesting example is the extended meaning ‘to deal with’. As argued in Chapter 6, this meaning selects the properties <contact_{yes}> and <closeness_{yes}> in a sentence like *I wouldn't touch that business*. However, when this meaning specifically refers to dealing with something superficially as in (30), the property <briefness_{yes}> is also selected.

(30) He barely *touched* on the incident in his speech

As is the case in the other examples discussed above, in (30) the property <briefness_{yes}> is highlighted by the adverb *barely*. This is corroborated if we look at examples like (31), where instead of an adverb like *barely* we include an adverbial expression like *many times, for a long time*.

(31) I have already *touched* that topic many times in the meeting

In this case, the meaning is no longer ‘to deal with something superficially’, we have dealt with that topic so many times that we are now very familiar with it.

7.2.3. SUMMARY

Starting from the basic idea that polysemy is not to be localised on a single lexical item – the perception verb in this thesis –, in this section I have proposed two major constraints on polysemy: ‘gradable polysemy’ and ‘verb-property requirement’.

¹⁵⁰ It is important to point out that the property <briefness_{yes}> is still present in this prototypical physical meaning; it forms part of the set of prototypical properties that characterise this sense perception (see Chapter 5).

Graduable polysemy states that the weight of the semantic content of the different elements in the overall meaning of a sentence is not the same in all extended meanings, but hierarchically organised in three different degrees: ‘unpredictable polysemy’, ‘verb-driven extensions’, and ‘argument-driven extensions’.

Verb-property requirement states that the properties that characterise the different elements that interact with the verb must not violate the prototypical properties that constitute the bodily basis upon which the polysemy of this semantic field is based.

Polysemy, then, is constrained not only by the weight of the semantic content of each participating element in these extended meanings; but also by the specific choice of only those elements whose semantic content does not clash with the nature (properties) of the semantic field of perception.

7.3. HOW UNIVERSAL IS POLYSEMY?

Throughout this thesis, I have been analysing and describing the polysemy that takes place in perception verbs. In Chapter 2, I gave a description of the different polysemous meanings that are found in this semantic field. Based on the linguistic framework of Cognitive Linguistics, and on Sweetser’s previous work on these verbs, I argued that these semantic extensions were not the result of chance, but that they were grounded in our experience of the senses themselves, on the way we perceive we use our five senses. Each sense is different from each other, and each sense is perceived in a different way from each other. These differences in the way we conceptualise each sense are shown and constrained by the way in which we create our language. Stemming from the typology of properties defined in Chapter 5 for the characterisation of this bodily basis for the different meanings in perception verbs, I introduced the processes called ‘Property Selection’ in Chapter 6. These processes are constraints on mappings between the source and the target domain, both in metaphorical and physical extended meanings.

In preceding chapters, I have discussed another important issue: the question of whether these mappings across different conceptual domains are universal or specific to one language.

According to cognitive linguistic theory, these mappings ought to be shared by different languages. If the semantic extensions that take place in a particular semantic field are based on, constrained and explained by our understanding and experience of the world in which we, as humans, live, it then follows that the different conceptualisations that we have, as well as the mappings between different conceptual domains of experience, have to be the same.

Based on the results from the synchronic analysis of perception verbs in Chapter 2, this statement seems to be true. In this Chapter, I not only analysed the meanings in English perception verbs, but also those in Basque and Spanish perception verbs. Although some of the extended meanings were particular to one of the languages, these three languages shared the majority of these meanings, despite the etymologically different origin of these verbs (see Chapter 3) and the differences between these languages.

In sum, these results seem to support the universal character of these mappings between the physical domain of perception and that of internal self and sensations (Sweetser 1990).

In this chapter, I have continued the discussion on polysemy from a different perspective. Here, I was not so much concerned about the conceptual mappings between different domains, but about the way in which these mappings are overtly expressed in a language. That is to say, how these polysemous senses are obtained in each language, how the meaning of the different elements that co-occur with the perception verb in the same sentence constrains and contributes to the creation of the extended meaning.

I started the chapter by reviewing Brugman's analysis of the English preposition *over*. I showed how some of the meanings attributed to this preposition were obtained through the interaction of the semantic content of this preposition and the other elements in the sentence (verb, noun, etc.). This same conclusion was supported by the analysis of tactile and olfactory verbs in Section 7.2. Based on these data, I introduced the concept of 'gradable polysemy'. Graduable polysemy stated that the interaction between the semantic content of the different elements in a sentence – in this case, the tactile and olfactory verb and its arguments – is subject to three different degrees of compositionality.

In Section 7.2, graduable polysemy was only applied to the semantic extensions of English tactile and olfactory verbs. However, as has already been pointed out in Section 7.1.2, the way languages have to express the same concepts is not always the same. What in one language can be expressed by one word (cf. Spanish *subir*), in others may need the interaction of the meaning of two different words (cf. English *go up*). That is to say, what in some languages are ‘unpredictable’ cases of polysemy in others may be ‘predictable’ cases; what in some languages are ‘argument-driven extensions’, in others can be ‘verb-driven extensions’.

In other words, graduable polysemy does not seem to be universal¹⁵¹, but specific to each language.

Before we tackle the theoretical implications of this statement, let us illustrate this point with the last example from the previous section, reproduced here as (32).

(32) John *touched* Mary

In English, this is an example of unpredictable polysemy because the different polysemous senses of this sentence cannot be predicted by the meaning of the arguments the verb takes. The question now is whether in the other two languages under investigation, the same unpredictable polysemy is found as well.

The same sentence can be translated into Basque (33) and Spanish (34).

(33) Jonek Miren *ukitu* *zuen*
 john.ERG mary.ABS touch AUX
 ‘John touched Mary’

(34) Juan *tocó* a María
 john touched to mary
 ‘John touched Mary’

In both languages, the only possible interpretation of (33) and (34) is the physical reading. In these sentences, it is understood that John physically touched

¹⁵¹ It is important to bear in mind that this universality is restricted to those languages that share a common cultural background. English, Basque and Spanish – although linguistically different languages – share the same Western culture. It would be necessary to study this semantic field of

Mary. In no way can they have the metaphorical ambiguity that exists in English. This is not to say that it is impossible to express the metaphorical ‘to affect’ reading in these two languages with tactile verbs. See, for instance examples (35) in Basque and (36) in Spanish.

- (35) Edertasunak *ukitu* du azkenean Iñakiren bihotz
gogorra
beauty.ERG touch AUX end.INE iñaki.GEN heart
strong.ABS
‘In the end, beauty changed Iñaki’s hard feelings’

- (36) Juan le *tocó* el corazón a María
john 3SG.DAT touched the heart to mary
‘John touched Mary’s heart’

In Basque as well as in Spanish the mapping between the physical domain of touch and that of ‘to affect’ is allowed as well; but in order to reach this meaning it is necessary to add a complement to the verb that denotes feelings. The direct object in (35) and (36), the heart, is understood not as a physical object; under the cognitive approach, heart is a metaphorical realisation of the image schema of a container, where HEART IS A CONTAINER FOR FEELINGS (Lakoff and Johnson 1980). In fact, as Moliner (1983) points out, in Spanish the verb *tocar* needs expressions such as *el corazón* ‘the heart’, *el amor propio* ‘one’s own pride’, *la dignidad* ‘dignity’ in order to imply this interpretation.

In Basque, there is another possibility. Instead of using the verb *ukitu*, the meaning ‘to affect (metaphorically)’ can be expressed by the verb *hunkitu*, as in (37).

- (37) Jonek Miren *hunkitu* zuen
jon.ERG mary.ABS touch AUX
‘John touched Mary’

sense perception in other languages free from this Western cultural background in order to prove or disprove the universal character of these mappings.

In Basque, the verbs *ukitu* and *hunkitu* are etymologically related (see Michelena 1990 [1985], and Chapter 3). In general, however, *ukitu* is more widely used for the physical contact and *hunkitu* is usually restricted to the abstract interpretation. Nevertheless, both verbs can also be used in the other way, provided that an adjunct or argument specifies that a hand is being used for the touching, as in (38), or that the subject is non-physical, as in (39).

- (38) Eskuaz *hunkitu* diot
 hand.INSTR touch AUX
 ‘He touched him with his hand’ (Aulestia 1989)

- (39) Zure hitzek sakon *ukitu* naute
 your words.ERG deeply touch AUX
 ‘Your words touched me very deeply’

One of the semantic extensions proposed by Sweetser (1990; see also Chapter 4) in the sense of smell is use of bad smell in English to refer to bad character or dislikeable characteristics (1990: 37). In a sentence like (40) below, the meaning can be taken as ambiguous, without any context it is not possible to tell whether we are referring to a physical ‘bad smell’ or a metaphorical ‘bad smell’.

- (40) What John is doing *stinks*

In this sentence, *what John is doing*, is too vague without a context to be able to tell whether the meaning is metaphorical or not. If we change the subject for an entity like *business* in (41), then the ambiguity disappears because of the characteristics that an entity like *business* has, a business cannot actually give off a physical smell. Therefore, (41) must be understood metaphorically.

- (41) This business *stinks*

According to the classification of graduable polysemy proposed in the previous section, (40) is an example of ‘unpredictable polysemy’ and (41) of ‘verb-driven extension’.

However, in this section our major concern is not to classify this meaning according to the hierarchical graduable polysemy, but to see whether this classification for the English sentences corresponds to the same classification in its Basque and Spanish counterparts.

In Basque, as pointed out in Chapter 2, there are no percept olfactory verbs. This meaning is expressed by the periphrasis *usain erion* ‘to give off smell’ as in (42) and (43).

- (42) Jon egiten ari denari *usain txarra dario*
 john.ABS do.HAB be busy AUX.REL.DAT smell bad.ABS gives
 ‘What John is doing stinks’

- (43) Negozio honi *usain txarra dario*
 business that.DAT smell bad.ABS gives
 ‘That business stinks’

As is the case in English, (42) can be interpreted both physically – what John is doing is producing a foul smell –, and metaphorically – what John is doing is not good, legal. In (43), on the other hand, the meaning is metaphorical due to the subject *negozio honi* ‘that business’. However, it is important to notice that the negative content in these two sentences – the fact that it is a bad smell –, is inferred by the adjective *txar* ‘bad’, not by the verb itself as it was the case in English.

In Spanish, sentence (44) can be translated in two different ways.

- (44) Lo que está haciendo Juan *huele mal*
 it.ACC that is doing John smells badly
 ‘What John is doing stinks’

- (45) Lo que está haciendo Juan me *huele mal*
 it.ACC that is doing John I.DAT smells badly
 ‘What John is doing stinks’

Sentence (44) corresponds to the physical meaning of *stink*. John is doing something and it is giving off this bad smell. We know that it has a bad smell

because of the adverb *mal* ‘badly’; unlike in English, this negative quality of smell is not contained in the verb itself, but in the adverb or adverbial expression that is added to the verb¹⁵². Sentence (45), on the other hand, corresponds to the metaphorical meaning of *stink*. The only difference between these two sentences in Spanish is the use of the dative personal pronoun, *me*. Therefore, it seems that this pronoun triggers the shift from a physical domain to a metaphorical domain.

The dative pronoun *me* suggests a major involvement of the speaker into the action he is reporting. Whereas in (44) the speaker simply says that what John is doing does not have a good smell, in (45) the speaker is not only reporting that, but also judging John's activity. In (44), the verb *smell* is understood as a percept verb – emission of smell. In (45), the verb *smell* changes from being a percept verb to an experiencer verb – perception of smell carried out unconsciously by the subject¹⁵³. This change is carried out by the pronoun *me*.

Interestingly enough, an unambiguous sentence like (41), where the subject *this business* seems to be crucial in the metaphorical interpretation, can be translated with or without the dative pronoun in Spanish as in (46). In both cases, the meaning remains metaphorical.

- (46) Este negocio (me) *huele* mal
 this business I.DAT smells badly
 ‘This business stinks’

These examples show that, although the same semantic mappings between different domains take place cross-linguistically, the strategies that each language follows to express such meanings are different.

¹⁵² The Spanish verb *apestar* is the closest equivalent to English *stink* (see Ibarretxe-Antuñano 1997). *Apestar* can refer to both physical and metaphorical meanings. This verb is not used in this example, however, because it is not etymologically related to olfactory verbs, it comes from the word *peste* ‘plague’ (< Lat. *pestis* ‘destruction, plague’). Its semantic development, nevertheless, has followed a similar path. As noticed in Chapter 5, smells are usually named after the entity that gives off the smell, i.e. the plague. After the verbalisation of this noun, the verb *apestar* has shifted from the physical meaning of giving off a bad smell to indicate that something has bad characteristics.

¹⁵³ Recall the distribution of properties in the semantic extensions of smell in Section 6.2.3, (45) exemplifies the meaning ‘to suspect’, characterised by the properties <voluntary_{no}>, <detection_{yes}>.

What in one language can be overtly expressed by a single lexical item – a verb –, in another language may require the meaning resulting from several lexical items – a verb and arguments.

This statement has important implications for our theory of polysemy and its universal character.

First of all, it is important to make a distinction between conceptual mappings on the one hand, and overt realisations of those conceptual mappings on the other, between the links established between different domains of experience and the different strategies that languages follow to overtly express those links. In other words, one thing appeals to our conceptualisation of the world, shared by all humans with the same cultural background; the other, to the linguistic means that each language in particular has.

In previous analyses of so called polysemous lexical items, there was no distinction between these two concepts. If a lexical item was to be taken as polysemous in itself, that is to say if polysemous senses were localised in one lexical item without taking into account the semantic content of the other words that co-occur with this lexical item, then both conceptual structure and overt expression of such conceptual structure were the same. If the conceptual structure were cross-linguistic, and conceptual structure and the overt expression of such conceptual structure were the same, then, transitively, it could be argued that both were cross-linguistic.

However, I have shown that this is not the case. Lexical items are not generally polysemous in themselves, unless they are cases of ‘unpredictable polysemy’. They need the help of the semantic content of other lexical items in order to obtain those polysemous senses, and as shown in this section, which lexical items are required to trigger and build the different extended polysemous readings are not the same in every language¹⁵⁴.

It is for these reasons that I will consider that the verbs themselves are not polysemous, but that the conceptual domain of sense perception is polysemous. The

¹⁵⁴ It is important to bear in mind that although these lexical items are not the same cross-linguistically, they cannot just have any semantic content. The choice of what lexical items co-occur

different mappings presented in Chapter 2 are not to be taken as semantic extensions of the perception verbs themselves, but polysemous senses of the conceptual domain of sense perception. I will call the group of these extended meanings ‘**conceptual polysemy**’.

In sum, I argue that when we analyse the meanings that take place in a semantic field, we need to distinguish and address two different sides.

On the one hand, we need to establish its ‘conceptual polysemy’, i.e. the conceptual mappings that take place between different domains of experience. This conceptual polysemy is constrained by the different properties that characterise the bodily basis of the semantic field under analysis; in our case, the bodily basis of sense perception defined in Chapter 5. Because this bodily basis is shared by and common to all humans with the same cultural background, conceptual polysemy is cross-linguistic.

On the other hand, it is necessary to establish which elements are involved in the creation of such conceptual polysemy, and to what extent their semantic content participates in the creation of such extended meanings. The choice of what elements are required is constrained by the verb-property requirement. This requirement only allows those elements whose semantic content does not clash with the bodily basis of the semantic field under investigation (see Section 7.2.2). Graduable polysemy establishes and classifies the importance of the semantic content of these elements in the creation of such conceptual polysemy in three different degrees of compositionality (see Section 7.2.1). The results obtained in this part of the analysis are to be considered language specific.

I would like to finish this section with a brief mention of how this dichotomy may affect the processes that we use to map one domain of experience onto a different domain, namely metaphor and property selection.

Property Selection processes are defined as the selection of some of the properties from the set of prototypical properties that characterise the source domain in the target domain. These processes show exactly what part of the source domain is used, not only in metaphorical expressions, but also in physical extended meanings.

with the perception verb is constrained by the ‘verb property requirement’ as explained in Section 7.2.2.

Metaphor is a cognitive tool that – in conjunction with property selection processes – structures the mappings between a physical domain and an abstract domain.

The main function of both cognitive devices is to account for and structure the different semantic extensions of the semantic field under study, that is to say its conceptual polysemy.

Property Selection and metaphorical processes are constrained by the bodily basis of the semantic field under investigation; they are the cognitive tools that we have to map and structure our conceptual systems experientially. Therefore, we ought to include them in the first part of our analysis, the one that tackles cross-linguistic conceptual polysemy.

However, they are also affected by the overt realisation of the conceptual polysemy, because – as stated in the discussion on graduable polysemy in Section 7.2.1 – metaphorical and physical extended meanings are triggered by the semantic content of the different elements that co-occur in the same sentence to a bigger or smaller degree.

Recall that three different degrees of graduable polysemy have been established according to the degree of influence that the semantic content of the different lexical items that co-occur in the same sentence has in the overall meaning. (i) Unpredictable cases of polysemy were those cases where it is not possible to predict what the interpretation is by means of the choice of arguments (*John touched Mary*), (ii) verb-driven extensions were those in which the semantic content of the perception verb is most decisive for the meaning (*Mary can smell danger from miles away*), and (iii) argument-driven extensions were those where the semantic content of the argument determines the meaning (*John hardly touched the food*).

I have shown in this section that these three degrees are not the same cross-linguistically because languages have different strategies to express conceptual polysemy. This implies that the way in which these two cognitive devices are accessed is specific to each particular language. In other words, metaphor and property selection processes belong to the conceptual, cross-linguistic side because they structure our conceptual systems experientially, but because what actually triggers these mappings is the bigger or smaller interaction of the semantic content of

the co-occurring elements, then it follows that these two cognitive devices are also constrained by the way in which graduable polysemy affects each particular language.

This is an interesting point because it may explain why and how different the evolution of the meaning in some lexical items is from a cross-linguistic point of view. Take, for example, the case of the verbs chosen in this study for tactile perception, namely Eng *touch*, Bq *ukitu*, and Sp *tocar*. In English, the metaphorical extended meaning ‘to affect (emotionally)’ is an unpredictable case of polysemy (see Section 7.2.). In Basque and Spanish, on the other hand, the inclusion of a lexical item(s) with a very specific semantic content is necessary in order to access this meaning, they are verb-driven extensions instead. The fact that the English verb does not require so much ‘help’ from the other elements of the sentence for the creation of this meaning may indicate that a semantic change is a step closer to happen in English than in the other two languages, where the ‘help’ of other elements is still required¹⁵⁵. Further research into this area is necessary to support this hypothesis.

7.4. CONCLUSIONS

This chapter has focused on the question of how the polysemous senses of a lexical item are obtained; whether they are the result of the meaning of that particular item, or the result of the interaction between the semantics of that lexical item and the other elements that co-occur in the same sentence.

In Section 7.1, I have reviewed Brugman’s analysis of the polysemy of the preposition *over* and shown that these polysemous senses are not localised on the preposition itself. The other elements that accompanied the preposition are decisive in these meanings. I have also stated that the elements that are needed to convey the extended meanings are not the same from a cross-linguistic point of view.

Section 7.2 applies these preliminary results to the polysemy of tactile and olfactory verbs and puts forward a hypothesis to constrain polysemy, called ‘Graduable polysemy’. This hypothesis states that extended meanings are obtained through the interaction of the different elements of a sentence. However, the weight

¹⁵⁵ This may also explain why the default meaning of Bq *hunkitu* is precisely ‘to affect (emotionally)’.

of the semantics of the different elements in the overall meaning of a sentence is not the same in all extended meanings, but graduable.

There are three different grades of polysemy: (i) ‘Unpredictable polysemy’, when it is not possible to predict what the interpretation is by means of the choice of arguments, (ii) ‘Verb-driven extensions’, when it is the verb that mainly governs the choice of arguments and meaning, (iii) ‘Argument-driven extensions’, when the meaning is mainly determined by the verb arguments and other elements of the sentence.

It has been argued that these different elements that contribute to build up the polysemous senses of tactile and olfactory verbs in different degrees are constrained by the ‘verb property requirement’. This requirement states that the properties that characterise the different elements that interact with the verb must not violate the prototypical properties that constitute the bodily basis upon which the polysemy of these verbs is based. This requirement also shows the way in which some properties that characterised these perceptual processes are highlighted by the semantic content of these elements.

Finally, Section 7.3 has addressed the question of how universal polysemy is. Based on the results obtained from the application of graduable polysemy to the other two languages under investigation – Basque and Spanish –, it has been concluded that in order to analyse the polysemy found in a specific semantic field, it is necessary to distinguish between what I have called ‘conceptual polysemy’ and its overt realisation in different languages.

Conceptual polysemy refers to the conceptual mappings that take place between different domains of experience. It is constrained by the different properties that characterise the bodily basis of the semantic field under analysis, and therefore, it is not specific to one language but cross-linguistic. Cognitive devices such as metaphor and property selection processes carry it out.

The overt realisation of conceptual polysemy is language specific. Graduable polysemy establishes and classifies the importance of the semantic content of these elements in the creation of such conceptual polysemy in three different degrees of compositionality. The choice of what elements are required is constrained by the verb-property requirement.

CHAPTER 8: CONCLUSIONS

The work described in this thesis has been primarily concerned with the analysis of polysemy in the semantic field of perception verbs. This thesis set out to explore how and why these polysemous structures happen between the domain of physical perception and other different conceptual domains; and to what extent different languages share these polysemous senses.

The data analysis presented in Chapter 2 showed that these verbs convey a wide range of both physical and metaphorical meanings apart from the prototypical physical sense perception, and that many of these extended meanings were found cross-linguistically. The revision of different approaches to polysemy in Chapter 4 indicated that polysemy must be analysed under two complementary perspectives. On the one hand, as proposed in Cognitive Linguistics, meanings are motivated and grounded more or less directly in experience, in our bodily, physical and social / cultural experiences, and then elaborated by structures of imagination such as metaphor. Therefore, it is important to establish what the bodily basis of the semantic field under investigation is because it explains why certain mappings between different domains of experience occur. On the other hand, as proposed in Pustejovsky's Generative Lexicon, meanings are not obtained by means of only one lexical item, but by the interaction of the semantics of the different elements that occur in the same sentence. Therefore, it is important to analyse and state what elements and to what extent these elements contribute to the overall meaning. The framework developed in this thesis is summarised in the following section.

8.1. A NEW MODEL FOR POLYSEMY

The model for the analysis of polysemy put forward in this thesis is composed of two related parts. One part is concerned with the explanation of conceptual mappings between different domains of experience; and the other part with the explanation of how these conceptual mappings are overtly expressed by lexical items in different languages. Figure 8.1 summarises this approach.

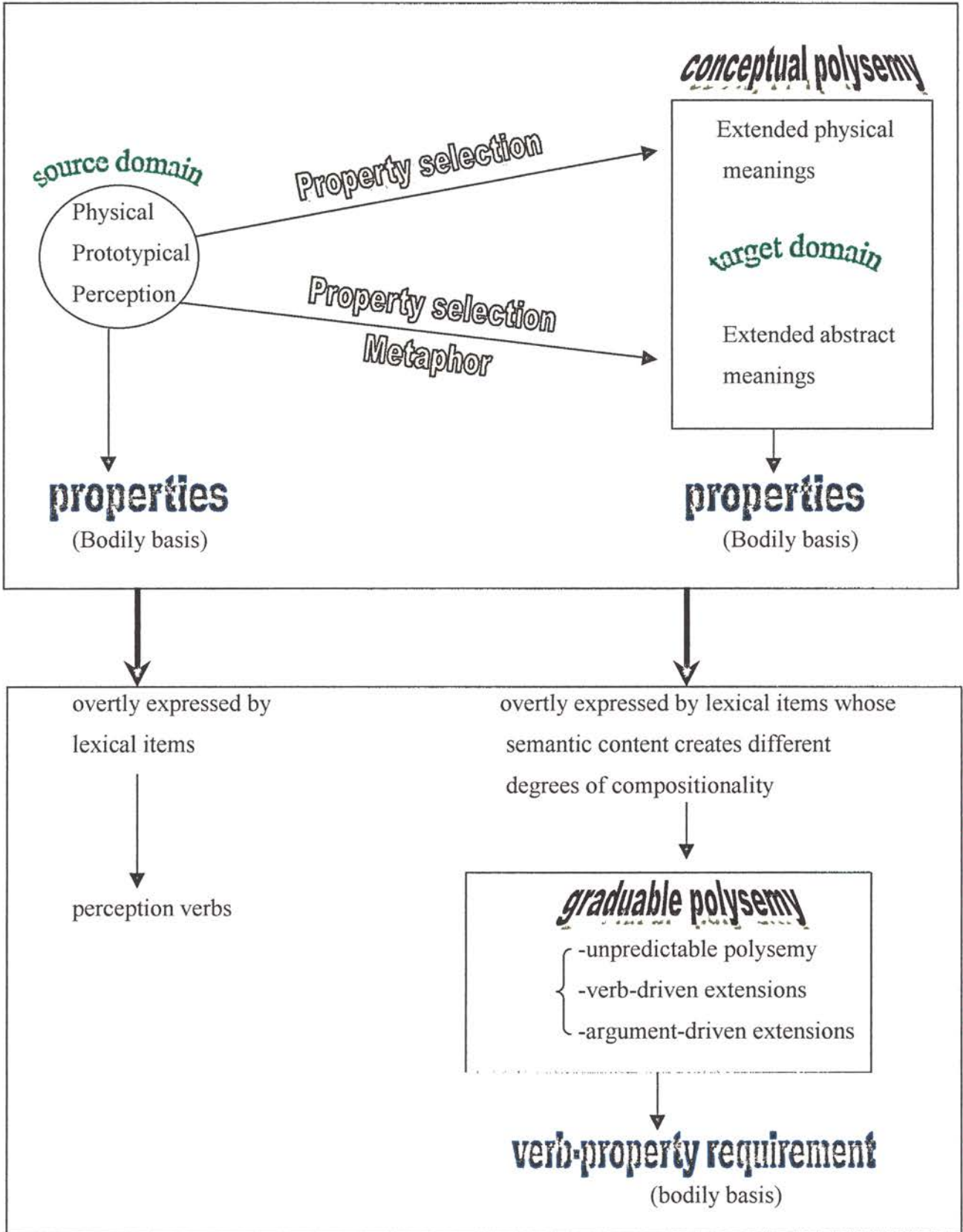


Figure 8.1: A new model for polysemy.

The upper square in Figure 8.1 shows how the analysis of conceptual mappings between different conceptual domains of experience is carried out. Here, there are two different domains: the source domain of physical perception, and the target domain, composed of extended physical and abstract meanings. The source domain is characterised in terms of properties. These properties are to be considered the bodily basis upon which our sense-related vocabulary is based. The bodily basis of sense perception is the physiology of the five senses and the way in which human beings perceive the perceptual processes. Because it applies to all human beings that share the same cultural background, the bodily basis is not applicable to one language only, but cross-linguistic.

The mappings between the source domain and the target domain are carried out by two different devices: Property Selection and Metaphor. Property Selection processes are used to show what properties from the set of properties that characterise the source domain are selected in the extended meanings. In these meanings, not all the properties that define the source domain are mapped, but only a selection of them. These processes show exactly what is transferred from one domain of experience onto the other. These processes take place in both physical and abstract extended meanings. Metaphor only applies to abstract meanings. This cognitive device makes it possible to link a physical domain with an abstract domain. Both Property Selection and metaphor are the cognitive tools that we have in order to map and structure our conceptual systems experientially. All extended meanings are therefore, constrained by the bodily basis of the source domain from which they originated, and structured by these two processes above.

In this part, we have talked about mappings between different conceptual domains. The diagrams show how one conceptual domain, the source domain of perception, has created by means of different cognitive tools several other conceptual semantic extensions, i.e. knowledge, reasoning, emotion... In this sense, it is argued that the domain of physical perception is polysemous because it does not only refer to physical perception itself, but also to other domains of experience. The group formed by the conceptual mappings that take place between different domains of experience is called conceptual polysemy.

The lower square in Figure 8.1 describes the techniques that languages use to overtly express and obtain the extended meanings that correspond to conceptual polysemy of a specific semantic field; and how these techniques are constrained. Unlike the upper part, this is not cross-linguistic, but specific to one language. In other words, conceptual polysemy is based on, and constrained by, the bodily basis of a domain of experience. This bodily basis is shared by and common to all humans with the same cultural background, it then follows that conceptual polysemy is universal. However, the semantic content of lexical items varies in different languages. What in one language is expressed by two words, in other languages may need the contribution of three words, or just one, therefore language-specific.

In this thesis, I chose perception verbs as the lexical domain which overtly expresses the source domain of physical perception. The next step is to show to what extent the semantic content of these verbs is responsible for the creation of these extended meanings, and to what degree the semantic content of other lexical items takes part in the creation of such meaning extensions. Graduable polysemy establishes and classifies the importance of the semantic content of these elements in the creation of such conceptual polysemy in three degrees of compositionality: (i) ‘Unpredictable polysemy’, when it is not possible to predict what the interpretation is by means of the choice of arguments, (ii) ‘Verb-driven extensions’, when it is the verb that mainly governs the choice of arguments and meaning, (iii) ‘Argument-driven extensions’, when the meaning is mainly determined by the verb arguments and other elements of the sentence.

The choice of these different elements that contribute to build up the polysemous senses in different degrees is constrained by the verb property requirement. This requirement states that the properties that characterise the different elements that interact with the verb must not violate the prototypical properties that constitute the bodily basis upon which the polysemy of these verbs is based. This requirement also shows the way in which some properties that characterise these perceptual processes are highlighted by the semantic content of these elements.

In sum, the model for polysemy proposed in this thesis comprises three stages of analysis: (i) to determine the bodily basis of the semantic field under investigation, (ii) to establish its conceptual polysemy, and (iii) to establish its graduable polysemy.

8.2. POSSIBLE DIRECTIONS FOR FURTHER RESEARCH

The model proposed in this thesis has been created on the basis of the results obtained from the analysis of synchronic data on perception verbs in three languages: English, Basque and Spanish.

There are three main directions in which the work described in this thesis could be developed.

The first is the issue of the universality of the conceptual polysemy described in this thesis. Our hypothesis stated that the extended meanings found in these languages had to be universal, because they were constrained by and based on our experience and understanding of the world that surrounds us. The data from these languages supported this hypothesis. However, the universality of the conceptual polysemy described in this thesis has to be understood within the boundaries of Western culture. In other words, these languages are typologically different, but they are embedded in the same Western cultural patterns. A possible direction for further research could be then, to look at this semantic field of sense perception in other languages that belong to different cultural backgrounds, such as African or Asian languages for example. The analysis of the conceptual polysemy in these languages will shed further light on the issue of how far meanings are motivated by our own conceptualisation and understanding of the world in which we live.

The second direction in which this work can be extended is the application of this model to the analysis of other semantic fields. This model accounts for the polysemy in sense perception. However only by applying this model to other fields it will be possible to test whether this model is suitable for the analysis of polysemy.

A third direction for further research could be the application of this model to the analysis of semantic change. If this model can explain how and why different synchronic conceptual mappings occur in a certain way and direction, then it might help to understand and clarify the reasons for changes of meaning in past linguistic history.

BIBLIOGRAPHY

GENERAL BIBLIOGRAPHY

- Ackerman, D. 1990. *A Natural History of the Senses*. London: Phoenix. [Paperback 1996].
- Ahlstrom, R., Berglund, R., Berglund, U., Lindvall, T. and A. Wennberg. 1986. 'Impaired odour perception in tank cleaners'. *Scandinavian Journal of Work and Environmental Health* 12: 574-581.
- Alm-Arvius, C. 1993. *The English Verb See: A Study in Multiple Meaning*. Göteborg, Sweden: Acta Universitas Gothoburgensis.
- Allerton, D. J. 1979. *Essentials of Grammatical Theory: A Consensus View of Syntax and Morphology*. London: Routledge and Kegan Paul.
- Anttila, R. 1972. *An Introduction to Historical and Comparative Linguistics*. New York: MacMillan.
- Aske, J. 1989. 'Path predicates in English and Spanish: A closer look'. *Proceedings of the Fifteenth Annual Meeting of the Berkeley Linguistic Society*. Berkeley: Berkeley Linguistics Society, pp. 1-14.
- Austin, J.L. 1961. *Philosophical Papers*. Oxford: Oxford University Press.
- Badia, P. 1995. 'Olfactory Sensitivity in Sleep and the Effects of Fragrances on the Quality of Sleep'. In A. Gilbert (ed.) *Compendium of Olfactory Research 1982 - 1994*. New York: Kendall / Hunt Publishers.
- Barcelona, A. 1997. 'Cognitive Linguistics: A usable approach'. In A. Barcelona (ed.) *Cuadernos de Filología Inglesa* 6.2: 7-32.
- Barcelona, A. 1997. 'Clarifying and Applying the Notions of Metaphor and Metonymy within Cognitive Linguistics'. *Atlantis* XIX.1: 21-48.
- Barcelona, A. 1998. 'El poder de la metonimia'. In J.L. Cifuentes-Honrubia (ed.) *Estudios de Lingüística Cognitiva*. Vols I-II. Alicante, Spain: Universidad de Alicante, pp. 365-380.
- Barcelona, A. (ed.) In press a. *Metaphor and Metonymy at the Crossroads. A Cognitive Perspective*. Berlin and New York: Mouton de Gruyter.
- Barcelona, A. In press b. 'On the plausibility of claiming a metonymic motivation for conceptual metaphor'. In A. Barcelona (ed.).

- Barcelona, A. In press c. 'Introduction'. In A. Barcelona (ed.).
- Barwise, J. and J. Perry. 1983. *Situations and Attitudes*. Cambridge, Mass.: MIT Press.
- Batteau, D. W. 1967. 'The role of the pinna in human localisation'. *Proceedings of the Royal Society of London, Series B* 168: 158-180.
- Bauer, J. 1949. *Die Ausdrücke für 'schauen' in den Mundarten Italiens und der Südschweiz (nach dem AIS)*. Erlangen.
- Bechtel, F. 1879. *Über die Bezeichnungen der sinnlichen Wahrnehmungen in den indogermanischen Sprachen. Ein Beitrag zur Bedeutungsgeschichte*. Weimer.
- Beidler, L. M. and R. L. Smallman. 1965. 'Renewal of cells within taste buds'. *Journal of Cell Biology* 27: 263-271.
- Benthem, J. van. 1983. *The Logic of Time*. Dordrecht: Kluwer Academic Publishers.
- Berlin, B. and P. Kay. 1969. *Basic Color Terms: Their Universality and Evolution*. Berkeley: University of California.
- Bierwisch, M. 1970. 'Semantics'. In J. Lyons (ed.) *New Horizons in Linguistics*. Harmondsworth: Penguin, pp. 166-84.
- Black, M. 1962. *Models and Metaphors*. Ithaca, NY: Cornell University Press.
- Black, M. 1993. 'More about metaphor'. In A. Ortony (ed.), pp. 19-41.
- Bloomfield, L. 1983. [1914]. *An Introduction to the Study of Language*. Amsterdam: John Benjamins.
- Bloomfield, L. 1935. *Language*. London: G. Allen and Unwin, Ltd.
- Boers, F. 1996. *Spatial Prepositions and Metaphor. A Cognitive Semantic Journey along the UP-DOWN and the FRONT-BACK Dimensions*. Tübingen: Gunter Narr Verlag.
- Bolinger, D. 1974. 'Concept and percept: Two infinitive constructions and their vicissitudes'. In *World Papers in Phonetics: Festschrift for Dr. Onishi's Kiju*. Tokyo: Phonetics Society of Japan, pp. 65-91.
- Boynton, R. M. and C. X. Olson. 1987. 'Locating basic colors in the OSA space'. *Color Research and Application* 12: 94-105.
- Bréal, M. 1900. [1897]. *Semantics: Studies in the Science of Meaning*. London: W. Heinemann.

- Briscoe, T. and A. Copestake. 1991. 'Sense Extensions as Lexical Rules'. *Proceedings of the IJCAI Workshop on Computer Approaches to Non-literal Language*. Sydney, Australia, 1991, pp. 12-20.
- Brown, R. 1958. 'How shall a thing be called?'. *Psychological Review* 65: 14-21.
- Brown, R. 1965. *Social Psychology*. New York: Free Press.
- Brugman, C. 1981. *The Story of Over*. MA Thesis. University of California at Berkeley. Distributed by L.A.U.T. July 1993. Series A. Paper Nr. 102.
- Brugman, C. 1988. *The Story of Over: Polysemy, Semantics and the Structure of the Lexicon*. New York: Garland.
- Brugman, C. 1990. 'What is the Invariance Hypothesis?'. *Cognitive Linguistics* 1.2: 257-266.
- Buck, C. D. 1949. *A Dictionary of Selected Synonyms in the Principal Indo-European Languages*. Chicago: Chicago University Press.
- Butterworth, G. and M. Castillo. 1976. 'Coordination of auditory and visual space in new-born infants'. *Perception* 5: 241-256.
- Cameron, L. and G. Low. 1999. 'Metaphor'. *Language Teaching* 32: 77-96.
- Cann, R. 1993. *Formal Semantics*. Cambridge: Cambridge University Press.
- Caplan, D. 1973. 'A note on the abstract readings of verbs of perception'. *Cognition* 2.3: 269-77.
- Casad, E.H. 1982. *Cora Locational and Structured Imagery*. PhD Thesis. University of California, San Diego.
- Casad, E.H. 1993. 'Locations, paths and the Cora verb'. In R.A. Geiger and B. Rudzka-Ostyn (eds.) *Conceptualisations and Mental Processing in Language*. Berlin and New York: Mouton de Gruyter, pp. 593-645.
- Chafe, W. and J. Nichols (eds.). 1986. *Evidentiality: the Coding of Epistemology in Language*. Norwood, N.J.: Ablex.
- Chomsky, N. 1986. *Knowledge of Language. Its Nature, Origin, and Use*. New York: Praeger.
- Classen, C. 1993. *Worlds of Sense. Exploring the Senses in History and across Cultures*. London and New York: Longman.
- Classen, C., D. Howes and A. Synnott. 1994. *Aroma. The Cultural History of Smell*. London and New York: Routledge.

- Coleman, L. and P. Kay. 1981. 'Prototype semantics: The English verb *lie*'. *Language* 57.1: 26-44.
- Collings, V. B. 1974. 'Human taste response as a function of locus on the tongue and soft palate'. *Perception and Psychophysics* 16: 169-174.
- Cooper, W.E. 1974a. 'Syntactic flexibility among English sensation referents'. *Linguistics* 133: 33-38.
- Cooper, W.E. 1974b. 'Primacy relations among English sensation referents'. *Linguistics* 137: 5-12.
- Copestake, A. and T. Briscoe. 1996. 'Semi-productive Polysemy and Sense Extension'. In J. Pustejovsky and B. Boguraev (eds.), pp. 15-68.
- Cruse, D. A. 1986. *Lexical Semantics*. Cambridge: Cambridge University Press.
- Crystal, D. 1991. *A Dictionary of Linguistics and Phonetics*. Oxford: Blackwells.
- Danesi, M. 1990. 'Thinking is seeing: Visual metaphors and the nature of abstract thought'. *Semiotica* 80.3/4: 221-237.
- Declerk, R. 1981. 'On the role of the progressive aspect in nonfinite perception verb complements'. *Glossa* 15.1: 83-114.
- De Saussure, F. 1916. *Cours de Linguistique Générale*. Edited by C. Bally and A. Sechehaye, with the collaboration of A. Riedlinger. Paris, Lausanne: Payot.
- Dik, S.C. and K. Hengeveld. 1991. 'The hierarchical structure of the clause and the typology of perception-verb complements'. *Linguistics* 29: 231-259.
- Dirven, R. 1993. 'Metonymy and metaphor: Different mental strategies of conceptualisation'. *Leuvense Bijdragen* 82: 1-28.
- Dowty, D. R., R.E. Wall and S. Peters. 1981. *Introduction to Montague Semantics*. Dordrecht, Holland: D. Reidel.
- Dundes, A. 1972. 'Seeing is believing'. *Natural History* 81: 8-12.
- Engen, T. 1960. 'Effects of practice and instruction on olfactory thresholds'. *Perceptual and Motor Skills* 10: 195-198.
- Engen, T. 1982. *The Perception of Odours*. New York: Academic Press.
- Evans, E. F. 1974. 'Neural processes for the detection of acoustic patterns and for sound localisation'. In F. C. Schmitt and F. G. Worden (eds.) *The Neurosciences: Third Study Program*. Cambridge: MIT Press, pp. 131-145.

- Evans, N. and D. P. Wilkins. 1998. *The knowing ear: An Australian test of universal claims about the semantic structure of sensory verbs and their extension into the domain of cognition*. Arbeitspapier Nr. 32 (neue folge). Institut für Sprachwissenschaft. Universität zu Köln.
- Fauconnier, G. 1985. *Mental Spaces*. Cambridge, Mass.: MIT Press.
- Fauconnier, G. 1994. *Mental Spaces: Aspects of Meaning Construction in Natural Language*. Cambridge: Cambridge University Press.
- Fauconnier, G. 1997. *Mappings in Thought and Language*. Cambridge: Cambridge University Press.
- Fauconnier, G. and M. Turner. 1994. 'Conceptual projection and middle spaces'. UCSD: Department of Cognitive Science Technical Report 9401. San Diego, California. [Internet Document available from <http://cogsci.ucsd.edu>].
- Fauconnier, G. and M. Turner. 1996. 'Blending as a central process in grammar'. In A. Golberg (ed.) *Conceptual Structure, Discourse and Language*. Stanford, California: CSLI Publications, pp. 113 –130.
- Fauconnier, G. and M. Turner. 1998. 'Conceptual integration networks'. *Cognitive Science* 22.2: 133-187.
- Fillmore, C.J. 1975. 'An alternative to checklist theories of meaning'. In C. Cogen, H. Thompson, G. Thrugood and K. Whistler (eds.) *Proceedings of the First Annual Meeting of the Berkeley Linguistic Society*. Berkeley: Berkeley Linguistics Society, pp. 123-131.
- Fillmore, C.J. 1977. 'Topics in lexical semantics'. In R.W. Cole (ed.) *Current Issues in Linguistic Theory*. Bloomington: Indiana University Press, pp. 76-138.
- Fillmore, C.J. 1982. 'Frame Semantics'. In Linguistic Society of Korea (ed.) *Linguistics in the Morning Calm*. Seoul: Hanshin, pp. 111-138.
- Fillmore, C.J. 1985. 'Frames and the semantics of understanding'. *Quaderni di Semantica* 6: 222-254.
- Frank, R.L and M. Susperregi. 1999. 'Conflicting Identities: A comparative study of non-commensurate 'Root metaphors' in Basque and Indo-European image schemata'. Paper presented at the 6th International Cognitive Linguistics Conference. Stockholm, July 10-16, 1999.
- Fodor, J.A. 1983. *The Modularity of Mind*. Cambridge, Mass.: MIT Press.
- Gamble, E.A.M.C. 1921. 'Review of *Der Geruch* by Hans Henning'. *American Journal of Psychology* 32: 290-295.

García Hernández, B. 1976. *El campo semántico de 'ver' en la lengua latina. Estudio estructural*. Salamanca: Universidad de Salamanca.

Geach P. and M. Black (eds.) 1952. *Translations from the Philosophical Writings of Gottlob Frege*. Oxford: Basil Blackwell.

Geeraerts, D. 1997. *Diachronic Prototype Semantics: A Contribution to Historical Lexicology*. Oxford: Clarendon Press.

Gibbs, R.W. Jr. 1994. *The Poetics of the Mind*. Cambridge: Cambridge University Press.

Gibson, J. J. 1950. *The Perception of the Visual World*. Boston: Houghton-Mifflin.

Gibson, J. J. 1966. *The Senses Considered as Perceptual Systems*. Boston: Houghton-Mifflin.

Gisborne, N. 1996. *English Perception Verbs*. PhD Dissertation. University College London.

Goatly, A. 1997. *The Language of Metaphors*. London and New York: Routledge.

Gómez, R. and K. Sainz (1995) 'On the origin of the finite forms'. In Hualde *et al.*, pp. 235-274.

Goossens, L. 1990. 'Metaphonymy: The interaction of metaphor and metonymy in expressions for linguistic action'. *Cognitive Linguistics* 1: 323-340. (Also reproduced in Goossens *et al.* (1995: 159-174)).

Goossens, L., P. Pauwels, B. Rudzka-Ostyn, A-M. Simon-Vanderbergen and J. Vanparys. 1995. *By Word of Mouth. Metaphor, Metonymy and Linguistic Action in a Cognitive Perspective*. Amsterdam and Philadelphia: John Benjamins.

Graziadei, P. P. C. and G. A. Monti Graziadei. 1988. 'Olfactory System, Turnover and Regeneration'. In *Readings from the Encyclopedia of Neuroscience. Sensory Systems II: Senses Other than Vision*, pp. 74-75.

Halliday, M. A. K. 1985. *An Introduction to Functional Grammar*. London, Baltimore and Melbourne: Edward Arnold.

Harper, R. 1972. *Human Senses in Action*. Edinburgh and London: Churchill Livingstone.

Heine, B., U. Claudi and F. Hünnebmeyer. 1991. *Grammaticalization. A Conceptual Framework*. Chicago: Chicago University Press.

- Held, R. 1988. *Readings from the Encyclopedia of Neuroscience. Sensory Systems I: Vision and Visual Systems*. Boston, Basel: Birkhäuser.
- Henning, H. 1916. *Der Geruch*. Leipzig: Barth.
- Herskovits, A. 1986. *Language and Spatial Cognition: An Interdisciplinary Study of the Prepositions in English*. Cambridge: Cambridge University Press.
- Hirst, G. 1987. *Semantic Interpretation and the Resolution of Ambiguity*. Cambridge: Cambridge University Press.
- Hock, H.H. 1986. *Principles of Historical Linguistics*. Berlin and New York: Mouton de Gruyter.
- Horie, K. 1993. *A Cross-linguistic Study of Perception and Cognition Verb Complements: A Cognitive Perspective*. PhD Dissertation. University of Southern California.
- Hopper, P. and E.C. Traugott. 1993. *Grammaticalisation*. Cambridge: Cambridge University Press.
- Howes, D. (ed.) 1991. *The Varieties of Sensory Experience. A Sourcebook in the Anthropology of the Senses*. Toronto: University of Toronto Press.
- Hualde, J.I., J.A. Lakarra and R.L. Trask (eds.) 1995. *Towards a History of the Basque Language*. Amsterdam and Philadelphia: John Benjamins.
- Ibarretxe-Antuñano, I. 1997. 'Smelling and perception: A cross-linguistic study'. In A. Barcelona (ed.) *Cuadernos de Filología Inglesa* 6.2: 113-21.
- Ibarretxe-Antuñano, I. 1999a. 'Semantic extensions in the sense of smell'. *International Journal of Basque Linguistics and Philology. Anuario de Seminario de Filología Vasca Julio de Urquijo*. (In press).
- Ibarretxe-Antuñano, I. 1999b. 'Metaphorical mappings in the sense of smell'. In R. W. Gibbs Jr. and G. Steen (eds.) *Metaphor in Cognitive Linguistics*. Amsterdam and Philadelphia: John Benjamins, pp. 29-45.
- Ibarretxe-Antuñano, I. 1999c. 'An inside look at tactile verbs'. In F. J. Ruiz de Mendoza, A. Barreras and S. Peña (eds.) *Perspectivas aplicadas de la organización del conocimiento y del procesamiento y uso del lenguaje*. Logroño: Universidad de Logroño. (In press).
- Ibarretxe-Antuñano, I. 1999d. 'Predictable vs. Unpredictable Polysemy'. In S. J. Hwang and A. Lommel (eds.) *LACUS Forum* 25: 201-211.
- Ibarretxe-Antuñano, I and L. Serratrice. Ms. *Making Sense of 'Over': An Study in Acquisition*. Department of Linguistics. University of Edinburgh.

- Iwata, S. 1995. 'Invariance again: what is preserved in a metaphorical mapping?'. *English Linguistics* 12: 173-196.
- Jäkel, O. 1997. *Metaphern in abstrakten Diskurs-Dömanen: eine Kognitiv-linguistische Untersuchung anhand der Bereiche Geistestigkeit, Wirtschaft und Wissenschaft*. Frankfurt a.M.: Peter Lang.
- Jeffers, R.J. and I. Lehiste. 1979. *Principles and Methods for Historical Linguistics*. Cambridge, Mass.: MIT Press.
- Johnson, M. 1987. *The Body in the Mind. The Bodily Basis of Meaning, Reason and Imagination*. Chicago: Chicago University Press.
- Johnson, M. 1992. 'Philosophical Implications of Cognitive Semantics'. *Cognitive Linguistics* 3.4: 345-366.
- Johnson, C. 1999. 'Metaphor vs. conflation in the acquisition of polysemy: the case of *see*'. In M. K. Hiraga, C. Sinha and S. Wilcox (eds.) *Cultural, Typological and Psychological Perspectives in Cognitive Linguistics*. Amsterdam and Philadelphia: John Benjamins.
- Kamp, H. 1979. 'Some remarks on the logic of change: Part 1'. In C. Rohrer (ed.) *Time, Tense, and Quantifiers*. Tübingen: Niemeyer, pp. 135-179.
- Katz, J.J. 1972. *Semantic Theory*. New York: Harper and Row.
- Katz, J.J. and J. Fodor. 1963. 'The Structure of Semantic Theory'. *Language* 39: 170-210.
- Katz, J.J. and P.M. Postal. 1964. *An Integrated Theory of Linguistic Descriptions*. Cambridge, MA: MIT Press.
- Kay, P. 1975. 'Synchronic variability and diachronic change in basic color terms'. *Language in Society* 4: 257-70.
- Kempson, R. 1977. *Semantic Theory*. Cambridge: Cambridge University Press.
- Keysar, B. and B. Bly. 1995. 'Intuitions of the transparency of idioms: Can one keep a secret by spilling the beans?'. *Journal of Memory and Language* 34: 89-109.
- Keverne, E. B. 1982. 'Chemical senses'. In H. B. Barlow and J. D. Mollon (eds.) *The Senses*. Cambridge: Cambridge University Press, pp. 428-447.
- Kirsner, R. and S. Thompson. 1976. 'The role of pragmatic inference in semantics: A study of sensory verb complements in English'. *Glossa* 10: 200-240.

- Kövecses, Z. 1995. 'American Friendship and the Scope of Metaphor'. *Cognitive Linguistics* 6.4: 315-346.
- Kövecses, Z. In press. 'The scope of metaphor'. In A. Barcelona (ed.).
- Kövecses, Z. and G. Radden. 1998. 'Metonymy: Developing a cognitive linguistic approach'. *Cognitive Linguistics* 9.1: 37-77.
- Kryk, B. 1979. 'Some remarks on the verbs of perception in English and Polish'. In J. Fisiak (ed.) *Papers and Studies in Contrastive Linguistics*. Poznann and Arlington, Va.: Center for Applied Linguistics, vol. VIII, pp. 113-231.
- Kurath, H. 1921. *The Semantic Sources of the Words for the Emotions in Sanskrit, Greek, Latin and the Germanic Languages*. Menasha (Wi): George Banta Publishing Co.
- Lakoff, G. 1970. 'A note on vagueness and ambiguity'. *Linguistic Inquiry* 1: 357-359.
- Lakoff, G. 1987. *Women, Fire and Dangerous Things. What Categories Reveal about the Mind*. Chicago and London: Chicago University Press.
- Lakoff, G. 1988. 'Cognitive semantics'. In Eco, U., M. Santambrogio and P. Violi (eds.) *Meaning and Mental Representations*. Bloomington: Indiana University Press, 119-54.
- Lakoff, G. 1989. 'The Invariance Hypothesis: Do metaphors preserve cognitive topology?'. Paper presented at the 1989 International Symposium on Cognitive Linguistics at Duisburg. (Distributed by the Linguistic Agency at the University of Duisburg, LAUD).
- Lakoff, G. 1990. 'The Invariance Hypothesis: Is Abstract Reason Based on Image-schemas?'. *Cognitive Linguistics* 1.1: 39-74.
- Lakoff, G. 1993. 'The Contemporary Theory of Metaphor'. In A. Ortony (ed.), pp. 202-251.
- Lakoff, G. and M. Johnson. 1980. *Metaphors We Live by*. Chicago and London: Chicago University Press.
- Lakoff, G. and M. Johnson. 1999. *Philosophy in the Flesh. The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.
- Lakoff, G. and M. Turner. 1989. *More than Cool Reason: A Field Guide to Poetic Metaphor*. Chicago: Chicago University Press.
- Landau, B. and L.R. Gleitman. 1985. *Language and Experience*. Cambridge, Mass.: Harvard University Press.

- Landau, B. and R. Jackendoff. 1993. 'What' and 'where' in spatial language and spatial cognition'. *Behavioural and Brain Sciences* 16: 217-265.
- Langacker, R.W. 1987. *Foundations of Cognitive Grammar, Vol. I: Theoretical Prerequisites*. Stanford, California: Stanford University Press.
- Langacker, R.W. 1991a. *Foundations of Cognitive Grammar, Vol. II: Descriptive Application*. Stanford, California: Stanford University Press.
- Langacker, R.W. 1991b. *Concept, Image, and Symbol. The Cognitive Basis of Grammar*. Berlin and New York: Mouton de Gruyter.
- Langacker, R.W. 1993. 'Reference-point constructions'. *Cognitive Linguistics* 4.1: 1-38.
- Lapesa, R. 1980. *Historia de la Lengua Española*. Madrid: Gredos.
- Lawless, H. T. and T. Engen. 1977. 'Association to odors: Interference memories, and verbal labelling'. *Journal of Experimental Psychology* 3: 52-59.
- Leech, G. 1971. *Meaning and the English Verb*. London: Longman.
- Leech, G. 1981. *Semantics: the Study of Meaning*. Harmondsworth: Penguin. 2nd Ed.
- Lehrer, A. 1974. *Semantic Fields and Lexical Structure*. Amsterdam and London: North Holland.
- Lehrer, A. 1990. 'Polysemy, Conventionality, and the Structure of the Lexicon'. *Cognitive Linguistics* 1.2: 207-246.
- Lindner, S.J. 1982. *A Lexico-semantic Analysis of English Verb Particle Constructions with 'Out' and 'Up'*. PhD Dissertation. University of California, San Diego.
- Lipinska-Grzegorek, M. 1977. *Some Problems of Contrastive Analysis: Sentences with Nouns and Verbs of Sensual Perception in English and Polish*. Edmonton, Canada and Champaign, USA: Linguistic Research, Inc.
- Lounsbury, F. 1964. 'A formal account of the Crow – and Omaha – type kinship terminologies'. In W.H. Goodenough (ed.) *Explorations in Cultural Anthropology*. New York: McGraw-Hill, pp. 351-94.
- Lyons, J. 1977. *Semantics*. (2 vols.) Cambridge: Cambridge University Press.
- Maelicke, A. 1990. *Vom Reiz der Sinne*. Weinheim: KCH.

- McMahon, A. 1994. *Understanding Language Change*. Cambridge: Cambridge University Press.
- Mervis, C.B. and E. Rosch. 1981. 'Categorization of natural objects'. *Annual Review of Psychology* 32: 89-115.
- Michelena, L. 1964. *Textos Arcaicos Vascos*. Madrid: Ediciones Minotauro.
- Michelena, L. 1988. *Sobre Historia de la Lengua Vasca*. 2 vols, ed. J.A. Lakarra. Donostia / San Sebastian: Anejos del Seminario de Filología Vasca 'Julio de Urquijo' 10.
- Michelena, L. [1961, 1977, 1985] 1990. *Fonética Histórica Vasca*. Donostia: Gipuzkoako Foru Aldundia.
- Miller, G. A. and P. N. Johnson-Laird. 1976. *Language and Perception*. Cambridge, MA: Harvard University Press.
- Miller, I. J. Jr. and Bartoshuck, L. M. 1991. 'Taste perception, taste bud distribution, and spatial relationships'. In T. V. Getschell, R. L. Doty, L. M. Bartoshuck, and J. B. Snow, Jr. (eds.) *Smell and Taste in Health and Disease*. New York: Raven Press, pp. 175-204.
- Miller, I. J. Jr. and F.E. Reedy. 1990. 'Variations in human taste bud density and taste intensity perception'. *Physiology and Perception* 47:1213-1219.
- Moiseeva, N. 1998. 'Verbs of perception in Russian'. In M. Giger, T. Menzel and B. Wiemer (eds.), *Lexicologie und Sprachveränderung in der Slavia*. Studia Slavica Oldenburgensia 2. Oldenburg: Bibliotheks- und Informationssystem der Universität Oldenburg, pp. 153-164.
- Mönnich, U. Ms. *Ereignisse und Gedanken: Syntax und Semantik von Perzeptionsverbkomplementen*. Universität Tübingen.
- Moulton, D. G. 1976. 'Minimum odorant concentrations detectable by the dog and their implication for olfactory receptor sensibility'. In D. Muller-Schwarze and M.M. Mozell (eds.) *Chemical Signals in Vertebrates*. New York: Plenum Press, pp. 455-464.
- Mujika, L.M. 1982. *Latina eta Erromanikoaren Eragina Euskaran. (Euskal Lexikoaren Azterketa Bideetan)*. Donostia: Sendoa argitaldaria.
- Murphy, G. L. 1996. 'On metaphoric representation'. *Cognition* 60: 173-204.
- Nerlich, B. and D. D. Clarke. 1997. 'Polysemy. Patterns of meaning and patterns of history'. *Historiographia Linguistica* XXIV.3: 349-385.

- Noonan, M. 1985. 'Complementation'. In T. Schopen (ed.) *Language Typology and Syntactic Description*, Vol. II. Cambridge: Cambridge University Press, pp. 42-142.
- Nunberg, G. 1979. 'The non-uniqueness of semantic solutions: Polysemy'. *Linguistics and Philosophy* 3: 143-84.
- Nunberg, G. 1996. 'Transfers of meaning'. In J. Pustejovsky and B. Boguraev (eds.), pp. 109-132.
- Olfactory Research Fund. 1996. *Living well with your Sense of Smell*. New York: Olfactory Research Fund Ltd.
- Ortony, A. 1993. [1979]. *Metaphor and Thought*. Cambridge: Cambridge University Press.
- Palmer, F. R. 1966. *A Linguistic Study of the English Verb*. London: Longman.
- Palmer, F. R. 1981. *Semantics*. Cambridge: Cambridge University Press.
- Panther, K.-U. and G. Radden (eds.). 1999. *Metonymy in Language and Thought*. Amsterdam and Philadelphia: John Benjamins.
- Papafragou, A. 1996. 'On metonymy'. *Lingua* 99.4: 169-195.
- Pelletier, F.J. and L.K. Schubert. 1986. 'Mass expressions'. In D. Gabbay and F. Guenther (eds.) *Handbook of Philosophical Logic*. Dordrecht: Reidel, 327-407.
- Perurena, P. 1992. *Koloreak Euskal Usarioan*. Donostia: Erein.
- Pollard, C and I.A. Sag. 1994. *Head-Driven Phrase Structure Grammar*. Chicago and London: Chicago University Press.
- Poutsma, H. 1926. *A Grammar of Late Modern English. Part II: The Parts of Speech. Section II*. Groningen: P. Nordhoff.
- Prévot, A. 1935. 'Verbes grecs relatifs à la vision et noms de l'oeil'. *RPh* 9: 133-60.
- Pustejovsky, J. 1991. 'The Generative Lexicon'. *Computational Linguistics* 17: 409-41.
- Pustejovsky, J. 1995. *The Generative Lexicon*. Cambridge, Mass.: MIT.
- Pustejovsky, J. and P. Anick. 1988. 'On the Semantic Interpretation of Nominals'. *Proceedings of COLING- 1988*. Budapest, 1988, pp. 518-523.
- Pustejovsky, J. and B. Boguraev. 1996. *Lexical Semantics. The Problem of Polysemy*. Cambridge: Cambridge University Press.

- Radden, G. In press. 'How metonymic are metaphors'. In A. Barcelona (ed.).
- Radden, G. and Z. Kövecses. 1996. 'Towards a theory of metonymy'. Hamburg: Cognitive Linguistics: Explorations, Applications, Research (C.L.E.A.R.).
- Ratliff, F. 1976. 'On the psychophysical basis of universal color names'. *Proceedings of American Philosophical Society* 120: 311-330.
- Reddy, M. 1993 [1979]. 'The Conduit Metaphor: A Case of Frame Conflict in our Language about Language'. In A. Ortony (ed.), pp. 284-324.
- Rogers, A. 1971. 'Three kinds of physical perception verbs'. *Chicago Linguistics Society* 7: 206-223.
- Rogers, A. 1972. 'Another look at flip perception verbs'. *Chicago Linguistics Society* 8: 303-316.
- Rogers, A. 1973. *Physical Perception Verbs in English: A Study in Lexical Relatedness*. PhD Dissertation. University of California, Los Angeles.
- Rohrer, T. 1997. 'Conceptual blending on information highway: How metaphorical inferences work'. In W.A. Liebert, G. Redeker and L. Waugh (eds.) *Discourse and Perspective in Cognitive Linguistics*. Amsterdam and Philadelphia: John Benjamins.
- Rosch, E. 1973. 'Natural Categories'. *Cognitive Psychology* 4: 328-50.
- Rosch, E. 1977. 'Human Categorization'. In N. Warren (ed.) *Studies in Cross-cultural Psychology*. London: Academic Press, vol. 1, pp. 1-49.
- Rosch, E. 1978. 'Principles of categorization'. In E. Rosch and B. B. Lloyd (eds.) *Cognition and categorization*. Hillsdale, NJ: Erlbaum, pp. 27-48.
- Rosch, E. 1983. 'Prototype classification and logical classification'. In E. Scholnik (ed.) *New Trends in Cognitive Representation: Challenges to Piaget's Theory*. Hillsdale: Lawrence Erlbaum, pp. 73-86.
- Rosch, E. and C. Mervis. 1975. 'Family resemblances: Studies in the internal Structure of Categories'. *Cognitive Psychology* 7: 573-605.
- Rudzka-Ostyn, B. 1995. 'Metaphor, Schema, Invariance. The Case of Verbs of Answering'. In L. Goosens *et al.*, pp. 205-243.
- Ruiz de Mendoza, F.J. 1997. 'An interview with George Lakoff'. In A. Barcelona (ed.) *Cuadernos de Filología Inglesa* 6.2: 33-52.
- Schiffman, S. S. 1974. 'Physiochemical correlates of olfactory quality'. *Science* 185: 112-117.

- Schiffman, S. S. and R. P. Erickson. 1980. 'The issue of primary tastes versus a taste continuum'. *Neuroscience and Biobehavioral Reviews* 4: 109-117.
- Schuchardt, H. 1923. *Primitae Linguae Vasconum: Einführung ins Baskische*. Halle and Saalle: Max Niemeyer.
- Schuchardt, H. 1925. *Das Baskisch und die Sprachwissenschaft*. Vienna.
- Schüle, S. Ms. *Perception Verb Complements in Mayan: A Case Study*. Seminar für Sprachwissenschaft. Universität Tübingen.
- Sekuler, R. and R. Blake. 1994. *Perception*. New York: McGraw-Hill.
- Sinha, C. and T. Kuteva. 1995. 'Distributed spatial semantics'. *Nordic Journal of Linguistics* 18: 167-199.
- Sinha, C., L.A. Thorseng, M. Hayashi and K. Plunkett. 1994. 'Comparative spatial semantics and language acquisition: Evidence from Danish, English and Japanese'. *Journal of Semantics* 11: 253-287.
- Sinha, C. and Thorseng, L.A. 1995. 'A coding system for spatial relational reference'. *Cognitive Linguistics* 6.2/3: 261-309.
- Slobin, D. I. 1996. 'Two ways to travel: Verbs of motion in English and Spanish'. In M. Shibatani and S. A. Thompson (eds.) *Grammatical Constructions. Their Form and Meaning*. Oxford: Clarendon Press, pp. 195-220.
- Sparks, D. L. 1988. 'Neural cartography: Sensory and motor maps in the superior colliculus'. *Brain, Behaviour and Evolution*, 31: 49-56.
- Sperber D. and D. Wilson. [1986] 1995. *Relevance. Communication and Cognition*. Oxford, Eng. and Cambridge, Mass.: Blackwells.
- Sweetser, E. 1986. 'Polysemy vs. Abstraction: Mutually Exclusive or Complementary'. *Proceedings of the Twelfth Annual Meeting of the Berkeley Linguistic Society*. Berkeley, Ca.: Berkeley Linguistics Society, pp. 528-539.
- Sweetser, E. 1987. 'The definition of *lie*. An examination of the folk models underlying a semantic prototype'. In D. Holland and N. Quinn (eds.) *Cultural Models in Language and Thought*. Cambridge: Cambridge University Press, pp. 43-69.
- Sweetser, E. 1990. *From Etymology to Pragmatics. Metaphorical and Cultural Aspects of Semantic Structure*. Cambridge: Cambridge University Press.
- Talmy, L. 1978. 'Figure and ground in complex sentences'. In J. Greenberg (ed.) *Universals of Human Language*. Stanford: Stanford University Press, vol. 4, pp. 627-49.

- Talmy, L. 1985. 'Lexicalisation patterns: Semantic structure in lexical forms'. In T. Shopen (ed.) *Language Typology and Syntactic Description*. Vol 3. Cambridge: Cambridge University Press, pp. 36-149.
- Talmy, L. 1988. 'Force dynamics in language and cognition'. *Cognitive Science* 12: 49-100.
- Talmy, L. 1991. 'Path to realisation: A typology of event conflation'. *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistic Society*. Berkeley: Berkeley Linguistics Society, pp. 480-519.
- Talmy, L. 1996. 'The windowing of attention'. In M. Shibatani and S.A. Thompson (eds.) *Grammatical Constructions: Their Form and Meaning*. Oxford: Oxford University Press, pp. 235-287.
- Taylor, J. 1995 [1989]. *Linguistic Categorisation. Prototypes in Linguistic Theory*. Cambridge: Cambridge University Press.
- Thorseng, L.A. 1997. *Learning Prepositions: In Children and Connectionist Networks*. PhD Thesis. University of Aarhus.
- Trask, R.L. 1995. 'History of non-finite verb forms'. In Hualde *et al.*, pp. 207-234.
- Trask, R.L. 1997. *A History of Basque*. London: Routledge.
- Tuggy, D. 1993. 'Ambiguity, polysemy, and vagueness'. *Cognitive Linguistics* 4: 273-90.
- Turner, M. 1987. *Death is the Mother of Beauty*. Chicago: Chicago University Press.
- Turner, M. 1990a. 'Aspects of the Invariance Hypothesis'. *Cognitive Linguistics* 1.2: 247-255.
- Turner, M. 1990b. 'Poetry: Metaphor and the conceptual context of invention'. *Poetics Today* 11.3: 463-482.
- Turner, M. 1991. *Reading Minds: The Study of English in the Age of Cognitive Science*. Princeton: Princeton University Press.
- Turner, M. 1993. 'An image-schematic constraint on metaphor'. In R. A. Geiger and B. Rudzka-Ostyn (eds.) *Conceptualisations and Mental Processing in Language*. Berlin and New York: Mouton de Gruyter, pp. 291-306.
- Turner, M. 1996. *The Literary Mind*. Oxford: Oxford University Press.
- Turner, M. and G. Fauconnier. 1995. 'Conceptual integration and formal expression'. *Metaphor and Symbolic Activity* 10: 183-204.

Ullmann, S. 1957. *The Principles of Semantics*. Oxford: Blackwell.

Ullmann, S. 1962. *Semantics: An Introduction to the Science of Meaning*. Oxford: Basil Blackwell.

Ungerer, F. and H-J. Schmid. 1996. *An Introduction to Cognitive Linguistics*. London: Longman.

Vandeloise, C. 1991. *Spatial Prepositions: A Case Study from French*. Chicago: Chicago University Press.

Vendler, Z. 1967. *Linguistics in Philosophy*. Ithaca: Cornell University Press.

Vendler, Z. 1970. 'Say what you think'. In J.L. Cowan (ed.) *Studies in Thought and Language*. Tucson: University of Arizona Press, pp. 79-97.

Viberg, A. 1983. 'A universal lexicalization hierarchy for the verbs of perception'. In F. Karlsson (ed.) *Papers from the Seventh Scandinavian Conference of Linguistics*. Helsinki: University of Helsinki, pp. 260-75.

Viberg, A. 1984. 'The verbs of perception: a typological study'. In B. Butterworth, B. Comrie and O. Dahl (eds.) *Explanations for Language Universals*. Berlin: Mouton de Gruyter, pp. 123-162.

Vinay, J.P. and J. Darbelnet. 1975. *Stylistique Comparée du français et de l'anglais*. Paris: Didier. English translation: 1995. *Comparative Stylistics in French and English; a Methodology for Translation*. Amsterdam and Philadelphia: John Benjamins.

Vinge, L. 1975. *The Five Senses: Studies in a Literary Tradition*. Lund, Sweden: Publications of the Royal Society of Letters at Lund.

Vlach, F. 1983. 'On situation semantics for perception'. *Synthese* 54: 129-152.

Weinreich, U. 1963. 'On the Semantic Structure of Language'. In J. Greenberg (ed.) *Universals of Language*. Cambridge, Mass.: MIT, pp. 114-171.

Weinreich, U. 1964. 'Webster's Third: A Critique of its Semantics'. *International Journal of American Linguistics* 30: 405-409.

Weinreich, U. 1966. 'Explorations in semantic theory'. In T. A. Sebeok (ed.) *Current Trends in Linguistics*, vol. 3. The Hague: Mouton, pp. 393-477.

Wertz, D. A., R. G. Bickford and D. Shannahoff-Khalsa. 1987. 'Selective hemispheric stimulation by unilateral forced nostril breathing'. *Human Neurobiology* 6: 165-171.

- Wertheimer, M. 1961. 'Psychomotor coordination of auditory and visual space at birth'. *Science* 134: 1692-1693.
- Wierzbicka, A. 1986. 'Human emotions: universal or culture specific'. *American Anthropologist* 88: 584-94.
- Wierzbicka, A. 1990. 'The meaning of color terms: semantics, culture and cognition'. *Cognitive Linguistics* 1: 99-150.
- Willett, T. 1988. 'A cross-linguistic survey of evidentiality'. *Studies in Language* 12.1: 51-97.
- Wittgenstein, L. 1953. *Philosophical Investigations*. New York: MacMillan.
- Wolfe, J. H. 1988. *Readings from the Encyclopedia of Neuroscience. Sensory Systems II: Senses Other than Vision*. Boston, Basel: Birkhäuser.
- Wolfe, J. H. 1988. 'Introduction'. In Wolfe (ed.), pp. xi-xiv.
- Zadeh, L. 1965. 'Fuzzy sets'. *Information and Control* 8: 338-53.
- Zwicky, A. and J Saddock. 1975. 'Ambiguity tests and how to fail them'. In J. Kimball (ed.) *Syntax and Semantics*. New York, San Francisco and London: Academic Press, vol. 4, pp. 1-36.

DICTIONARIES

BASQUE

- Agud, M. and A. Tovar. 1989-. *Diccionario Etimológico Vasco*. Donostia: Gipuzkoako Foru Aldundia.
- Aulestia, G. and L. White. 1992. *Euskara Ingelesa-Ingelesa Euskara Hiztegia*. Reno, Nevada: University of Nevada Press. (GALW)
- Aulestia, G. 1989. *Basque-English Dictionary*. Reno and LasVegas: University of Nevada Press.
- Bera-Lopez Mendizabal, P. 1960?. *Diccionario Vasco-Castellano*. Zarauz: Editorial Itxaropena. (BM)
- Azkue, R.M. 1905. *Diccionario Vasco-Español-Francés I-II*. Bilbao (AZ)
- Diccionario Bi Mila Hiztegia. Euskara-Españiera. Española-Euskara*. 1988. Bilbo: Elkar.
- Diccionario Hiru Mila Hiztegia. Adorez 7*. 1996. Bilbo: Bostak Bat. (HM)

Diccionario Retana de Autoridades del Euskera. 1976. Bilbao: Biblioteca de la Gran Enciclopedia Vasca. (AR)

Elhuyar Euskara-Gaztelania/Castellano-Vasco Hiztegia. 1996. Usurbil: Elhuyar Kultur Elkartea. (ELH)

Lhande, P. 1926. *Dictionnaire Basque-Français et Français-Basque. (Dialects Labourdin, Bas-Navarrais et Souletin)* Paris: Grabiell Beauchesne.

Löpelmann, M. 1968. *Etymologisches Wörterbuch der Baskischen Sprache*. (2 vols.) Berlin: Walter de Gruyter and Co. (Labourd, Nieder-Navarra, La Soule)

Michelena, L. 1987-. *Diccionario General Vasco. Orotariko Euskal Hiztegia*. Bilbao: Euskaltzaindia. (LM)

Mugica Barrondo, P. 1981. *Diccionario Vasco -Castellano I, II*. Bilbao: Mensajero.

Sarasola, I. 1984-95. *Hauta-lanerako Euskal Hiztegia*. Zarauz: Itxaropena. (IS)

ENGLISH

Advanced Memphis General Dictionary. (http://work.ucsd.edu:5141/cgi-bin/http:_webster) (AMGD)

Collins English Dictionary and Thesaurus. 1993 Italy: Harper Collins Publishers. (COL)

Maver, W. 1809. *Johnson's English Dictionary* (2 vols.) Glasgow: R. Chapman.

Oxford English Dictionary on CD-Rom. 1994. Oxford: OUP. 2nd Edition. (OED)

Oxford English Dictionary. 1986. Oxford: OUP. (OED)

Partridge, E. 1990. *Origins. An Etymological Dictionary of Modern English*. London: Routledge.

Skeat, W.W. 1953. *Etymological Dictionary of the English Language*. Oxford: Clarendon Press.

The American Heritage Dictionary. 1992. Houghton Mifflin Company. 3rd Edition. CD-ROM. (AM)

Weeley, E. 1902. *An Etymological Dictionary of Modern English*. London: John Murray.

Wilkinson, P.R. 1993. *Thesaurus of Traditional English Metaphors*. London and New York: Routledge.

SPANISH

Casare, J. 1959. *Diccionario Ideológico de la Lengua Española*. Barcelona: Gustavo Gili

Cassell's Spanish-English English-Spanish Dictionary. 1969, 1979. London: Cassell.

Cejador-Franca, J. 1968. *Vocabulario Medieval Castellano*. New York: Las Americas Publishing Company.

Clave. Diccionario del Uso del Español Actual. 1997. Madrid: SM.

Collins Spanish-English. English-Spanish Dictionary. Unabridged. 1996. Glasgow: Harper Collins Publishers. (4th) (CSE)

Corominas, J. and J.A. Pascual. 1983. *Diccionario Crítico Etimológico Castellano e Hispano*. (3 vols.) Madrid: Gredos. (DCECH)

Diccionario Anaya de la Lengua. 1991. Madrid: Grupo Anaya.

Diccionario de Autoridades. 1963. Gredos: Madrid. (Edición Facsímil)

Diccionario de la Real Academia de la Lengua Española. 1984. (2 vols.) Madrid: Real Academia Española. (RAE)

Diccionario Histórico de la Lengua Española. 1936-. (vol. II: B-C) Madrid: Real Academia Española.

Diccionario Ilustrado de la Lengua Española VOX. 1987. Barcelona: Bibliograf.

Diccionario Manual e Ilustrado de la Lengua Española. 1958. Madrid: Espasa-Calpe (2nd)

Diccionario Moderno Larousse Español-Inglés. 1976. Ediciones Larousse. (LAR)

Diez Mateo, F. 1943. *Diccionario Español Etimológico del Siglo XX*. Bilbao: Artes Gráficas Grijelmo, S.A.

García de Diego, V. 1954. *Diccionario Etimológico Español e Hispánico*. Madrid: S.A.E.T.A.

Gili Gaya, S. 1947. *Tesoro Lexicográfico (1492-1726)* (vol. I: A-E). Madrid: CSIC.

Moliner, M. 1983. *Diccionario del Uso del Español* (2 vols.). Madrid: Gredos. (MM)

Oxford Spanish Dictionary. 1994. Oxford, New York, Madrid: OUP. (OSD)

Richmond Compact Dictionary. 1995. Madrid: Santillana. (RCD)

Roque Barcía, D. 1902. *Primer Diccionario General Etimológico de la Lengua Española*. (3 vols.) Barcelona: Seix Editor. (BR)

LATIN

Ernout, A. and A. Meillet. 1959. *Dictionnaire Etymologique de la Langue Latine. Histoire des Mots*. (2 vols.) Paris: Librairie c. Klincksieck. (EM)

Oxford Latin Dictionary. 1968. (2 vols.) Oxford at Clarendon Press. (OLD)

MISCELANEOUS

Buck, C.D. 1949. *A dictionary of selected synonyms in the principal Indo-European languages*. Chicago: Chicago University Press.