

Semantic extensions in the sense of smell

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1. Introduction

For cognitive semantics, 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.

Sweetser adapts these cognitive semantic ideas to the study of semantic change and has claimed that semantic change is a one-way process: from the concrete (socio-physical) domain to the abstract (emotional, psychological) domain. These two domains are linked by means of metaphor, which according to Lakoff and Johnson (1980: 135) "allow(s) us to understand one domain of experience (target domain) in terms of another (source domain)". In the case of perception verbs, the source domain is the vocabulary of physical perception, whereas the target domain is the vocabulary of external self and sensations. Thus, in the particular case of English perception verbs, Sweetser establishes the following metaphorical mappings:

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

In the explanation of the structure of these metaphors of perception, Sweetser distributes these senses into two groups: the former comprises vision and hearing and the latter touch and taste. The focusing ability of vision and hearing, i.e., their ability to pick up one stimulus more or less consciously is what makes them be connected to objectivity and intellect. Subjectivity, intimacy and emotion, on the other hand, are linked to touch and taste, due to their associated entailments of physical contact with the thing sensed. Other authors have divided the senses in a similar way. Viberg (1984: 148), for instance, establishes a similar dichotomy: taste and touch as opposed to hearing and smell. It is my opinion, that such dichotomies should not be taken as fixed groups, i.e. these groups are formed in accordance with one property, in this case [contact], but this does not mean that other possible groups are not fea-

sible, but rather the contrary: depending on the property we select, a different group should be formed. This, however, does not imply that in some instances these groups can coincide in their members.

Sweetser does not mention where the sense of smell should be placed in her dichotomy and considers this sense not as salient as the rest of the senses in terms of metaphorical mappings. Taking English as a basis, Sweetser establishes only these two mappings:

- Bad smell to indicate bad character or dislikeable characteristics
- (1) He is a *stinker* (Sweetser 1990: 37)
- Detection of such characteristics
- (2) I *smell* something fishy about this deal (Sweetser 1990: 37)

With only these two abstract meanings, it is understandable that Sweetser concludes that smell "has fewer and less deep metaphorical connections with the mental domain than the other senses" (1990: 43). However, a closer look at the different meanings that these verbs can convey in the three languages of the sample, proves this claim to be wrong: the sense of smell has more abstract meanings than those cited above, as will be shown in the next section.

2. Extended meanings in the sense of smell

Although the sense of smell in human beings is not as developed as other senses such as vision, there is quite a great number of verbs connected to this sense in one way or another. In this section, the olfactory verbs selected in each language together with their meanings are presented.

In the different meanings that these verbs can convey, it is worth noticing that under the 'physical smell' meaning, two different types of smell are implied: the emission of odours and the perception of odours, and within the latter, when the subject is an active or an experiencer one.¹ In some of the other senses this distinction is overtly expressed by the choice of a different verb, as for instance, in the sense of vision, we have in English the verbs *seem* (*look*), *look* and *see* respectively. Unfortunately, this does not seem to be the case in the sense of smell, but nevertheless, smell must be understood under these three cases.

2.1. The verbs of smell in Basque

Basque seems to be very rich in respect to the terms used for the sense of smell. In the *Diccionario Retana de Autoridades del Euskera* (1976) more than twenty-one verbs related to smelling can be found. Many of these verbs are dialectal variations and some of them have very specific meanings such as *usainoneztatu* 'to scent, to perfume' or *ufeztu* 'to stink'.

(1) For more information on the classification of the physical meanings of perception verbs, see Leech (1971), Rogers (1971, 1972), Kryk (1979), Viberg (1984) among others.

The most common and central verbs in the field of smell, together with their meanings are shown in Table 1.

Verbs	'physical smell (perception)'	'suspect'	'guess'	'investigate'	others
<i>usaindu</i>	+	+	+		'stink', 'scent'
<i>usain egin</i>	+	+	+		
<i>usain hartu</i>	+	+	+		'guess right'
<i>usainkatu</i>	+				
<i>usnatu</i>	+	+	+	+	'interfere, meddle'
<i>usmatu</i>	+	+	+		
<i>sumatu</i>	+	+	+		'perceive, notice'
<i>susmatu</i>		+			
<i>susmo hartu</i>		+			

Table 1: Verbs of smell in Basque

The central verb of smell is *usaindu* (*usaitu*, *usendu*, *usandu*). This verb expresses both the perception and the emission of a smell and abstract meanings such as 'suspect, guess'. It is used to express a mental meaning as well as a bad smell. *Usnatu*, *usmatu* and *sumatu* can be used in both senses too, concrete or abstractly. It is worth noticing that in the case of *usnatu* and *sumatu*, the nouns they come from *usna* 'sense of smell' and *suma* 'sense of smell', respectively, do not have this abstract meaning of 'suspicion', which indicates that a semantic shift has taken place from the 'perception of smell' to 'suspect, guess'. Further evidence that corroborates this statement is the verb *susmatu*. In Table 1, *susmatu* means 'suspect' but it does not share any of the other physical meanings. However, if we go back to its etymology, it appears that this verb is also directly connected to the sense of smell. According to Michelena (1990: 292) and Mujika (1982: 209), *susmatu* has an expressive *s-*, which has been added to the verb *usmatu*. Mujika further states that this verb comes from Spanish *busmear*; however, this statement seems to be unlikely. According to J. Corominas and J. A. Pascual (1983), the early form of this Spanish verb is *osmatu*, which is found in the *Glosas Silenses*, no. 7 (11th century) for the first time. The strong similarities between *osmatu* and Basque *usmatu* suggest that both verbs come from the same proto-form, which Corominas *et al.* believe to be **osmare*.

To sum up, the physical meanings that these Basque verbs lexicalise are both the emission and the perception of smells, either good or bad. As Sweetser claims, bad smells, when interpreted metaphorically, indicate bad characteristics:

- (3) *Urrun adi ni ganik, usaindua* (Retana 1976)
 go away IMP 1.SG.ABL smell.ABS
 'Go away from me stinker!'

However, contrary to her predictions, Basque verbs seem to establish more connections with the cognitive domain than those expected. Basque verbs do not only

link the physical domain with the mental domain when they are used for the detection of bad characteristics, but also the following categorisations seem to take place:

Physical smell →→ 'suspect'²

- (4) *Poliziak Mikelen hitzetan gezurra usaindu zuen*
 police.ERG Mike.POSS words.ABL lie. ABS smell 3.SG:PAST
 'The police smelt something fishy in Mike's words'

Physical smell →→ 'guess'³

- (5) *Kanturako haren zera ikusiz, mutrikuarra zela usaindu nuen*
 song.for he POSS way seeing mutriku.GEN was.COMP smell
 TRANS:1SG:PAST
 'From his way of singing, I guessed he was from Mutriku' (HM)

Physical smell →→ 'investigate'

- (6) *Mikel nere gauzen artean usnatzen barrapatu nuen*
 Mike.ABS my things.POSS between.ABL smell catch
 1.SG:PAST
 'I caught Mike nosing into my things'

From the above discussion, it can be concluded that Sweetser's assertion that the verbs of smell are associated with only two types of perceptual development is false. The question remains whether the Basque data indicate a parochial or a cross-linguistic property.

2.2. The verbs of smell in Spanish

The most common verbs of smell and their meanings can be seen in Table 2.

Verbs	'physical smell'		'suspect'	'guess'	'investigate'
	'emission'	'perception'			
<i>oler</i>	+	+	+	+	
<i>olfatear</i>		+			+
<i>busmear</i>		+			+

Table 2: Verbs of smell in Spanish

The central verb of smell in Spanish is *oler*. This verb can be used transitive or intransitively, although its Latin cognate *olĕre* was only used with the subject of the thing that emits odour, and *olfacere* was left for transitive use.

(2) *Guess* vs. *suspect*. These two verbs could be considered synonyms in some cases. However, based on the examples, we prefer to regard them as different verbs. *Suspect* always carries a negative meaning and seems to be a process verb type, whereas *guess* has a more neutral meaning and seems to be an achievement verb type.

(3) In the Northern dialect of Labourdin, some verbs such as *usnatu* (*iusnatu*) can also be interpreted as 'prophesy'.

According to J. Corominas & J. A. Pascual (1983), *olēre* was used for both transitive and intransitive instances already in Berceo (13th century), where the nominalisation of the verb *oler* as 'the sense of smell' can be found and therefore, it indicates that the verb *oler* was used in the sense of perception of odours. The explanation of this could be found in the loss of the verb *beder* 'to stink, stench' in the vocabulary of the educated people and also in the disappearance of Latin *putēre* 'to decompose; to have a bad smell'; as a consequence, *oler* is used for either good or bad smells. Other Romance languages use different verbs, so that they distinguish between bad and good smell. For instance, French *sentire* 'smell' and the verb for 'stink' *empester* (cf. Spanish *apestar*), *puir*, *puer* (< Latin *putēre*) verb and noun for 'stink'; Italian *sentire*, *odorare* 'smell' and *puzzare* (< Latin *putēre*) 'stink'; Portuguese seems to have only one verb too: *cheirar* 'smell, stink'; it also has *empestar* for 'to smell out' (cf. French *empester*, Spanish *apestar*).

An interesting point here is the fact that some Romance languages have adopted the Latin word *sentire*, in the place of *olēre-olfacere*. *Sentire* 'perceive, feel' is usually the verb used for describing general perception and it can also mean 'perception by the ear', as it is the case of Italian *sentire* and Catalan *sentir*.

The verb *olfatear* and its noun *olfato* 'sense of smell, intuition, instinct' in Spanish can be applied to animals, usually dogs, and to humans. If it is used with dogs, which are known for having an excellent sense of smell, its meaning is not abstract or figurative, but physical; for instance:

- (7) *El perro olfatea el rastro*
 the dog smells the trail
 'The dog smells the trail'

However, if this verb is used with people, the meaning is both physical and abstract. It means 'to nose into, to pry into' or 'to have instinct for something'. An example with the noun is more illustrative in this case; compare:

- (8) *Ese perro tiene buen olfato*
 that dog has good sense of smell
 'that dog has a good sense of smell'
- (9) *Ese hombre tiene buen olfato*
 that man has good sense of smell
 'That man has a good sense of smell/instinct'

Here it can be seen how in (8) the meaning is physical and in (9), the same words can have a physical meaning as well as metaphorical one, when used with human beings; (9) can mean that this man has a good/accurate sense of smell, but also that he has a natural instinct to see things, or that he has an instinct for business, for example.

In conclusion, it seems that both *oler* and *olfatear* have concrete and non-concrete meanings. The concrete meanings 'to perceive and to emit an smell' are already present in their Latin cognates: *olēre* 'to give off a smell, to smell sweet, to stink' and *olfacere* 'to detect the odour of, to smell at'. However, their figurative meanings seem to be par-

ticular to the Spanish verbs, as the Latin ones do not share them. This supports the idea that the semantic change is from concrete to abstract meanings (Sweetser 1990: 30).

Finally, *busmear*, which as seen before, seems to be related to Basque *usmatu*, offers another abstract meaning 'investigate, nose into', also shared by its Basque cognate. The verb *busmear*, whose primitive form is *usmar*, *osmar*, shares the same etymological origin as French *humer* 'smell, inhale', Italian *ormare* 'follow a trace' and Rumanian *urma* 'follow'. According to J. Corominas & J. A. Pascual (1983), these verbs could derive from Greek *osmasthai* > *osmé* 'odour'.

Spanish verbs then seem to support what has been said about Basque in the previous section. Sweetser's abstract categorisations do take place as in the case of *apestar* 'stink' or in (10), where the sentence can be interpreted both as a physical bad smell or as the detection of something wrong.

- (10) *Eso huele mal*
that smells badly
'That smells bad'

However, once again, other cognitive meanings are possible too:

Physical smell →→ 'suspect'

- (11) *Me huele que ella está detrás de todo esto*
refl.1SG smells that she is behind of all this
'I suspect she is behind all this'

Physical smell →→ 'guess'

- (12) *Juan ya se ha oído la broma*
John already refl.3SG has smelt the joke
'(I think) John might have guessed that it's a joke' (RCD)

Physical smell →→ 'investigate'

- (13) *Pillé a Miguel busmeando entre mis cosas*
caught to Mike nosing between my things
'I caught Mike nosing into my things'

It seems that the metaphorical meanings proposed for Basque do work for the Spanish verbs too, and therefore, we have evidence for the general falsity of Sweetser's statement.

2.3. The verbs of smell in English

So far it has been seen that Basque and Spanish seem to follow the same metaphorical mappings into the mental domain, and hence, this supports our claim that the sense of smell is not as weak sense in respect to extended meanings, as suggested by Sweetser.

As Sweetser based most of her study on perception verbs on English, it will be instructive to review the verbs of smell in English in order to see whether these metaphorical meanings can be also applied to this language.

Table 3 summarises the most common verbs of smelling in English and their meanings.

Verbs	'physical smell'		'suspect'	'guess'	'investigate'
	'emission'	'perception'			
smell	+	+	+	+	
sniff		+			+

Table 3: Verbs of smell in English

Stink and *stench* have not been included in Table 3, because of the specific meaning they have nowadays, i.e. 'bad smell'. However, it is worth noting that Old English *stinc* was first used for neutral smell and then, when *smellen* was introduced it came to mean 'bad smell'. The development of *stench* is somehow similar, as Old English *stenc* meant 'bad smell' but nowadays it is stronger than *stink* itself. *Stink*, as its cognates in Spanish *apestar* and Basque *ufeztu, usaindu*, can be also used in the abstract sense to indicate dislikeable mental characteristics as in (14):

(14) That idea stinks (Sweetser 1990: 37)

Therefore, the metaphorical meanings that English verbs develop are:

Physical smell →→ 'suspect'

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

Physical smell →→ 'guess'

(16) Mary can smell trouble a mile off (OSD)

Basque and Spanish share another meaning, i.e. 'investigate'. This meaning can be expressed with the verb *sniff* as in (17), and also with the verb to *nose* (cf. Sp. *meter las narices en algo*). Although to *nose* is not a verb of perception itself, but a verbalisation of the noun *nose*, the nose is the organ of smell and hereby, it is related to this group.

(17) The police have been sniffing around here again

From the data in Table 3, it can be concluded that English verbs of smell seem to follow the same patterns observed in the other two languages, both physical⁴ and abstract. This further supports our claim that the verbs of smell do have more meta-

(4) In previous sections, it has been mentioned that these verbs could denote either good or bad smells. This is also the case of English. However, it seems that the bad or good quality of the smell is not dependable upon the verb of smell itself, but upon the other elements of the sentence, as well as the context. For instance:

(18) The shoes smell

(19) My perfume smells

In (18), *smell* is immediately identified with a 'bad smell', whereas (19) is the opposite, it is a very nice smell; the different meaning depends on the subject, on the agent that emits the odour. The nature of subjects, as well as other issues, such as complementation, is not analysed in depth in this article but they remain as a potential field for further research.

phorical meanings than those established in Sweetser's analysis and also that these mappings are not language specific.

3. The sense of smell: property selection processes

Sweetser proposes that the links between the different domains (source/target) are carried out by metaphor. This seems to be true but only in those cases where the meaning is abstract, but not all the extended meanings that the sense of smell has are abstract, some of them are still concrete, but nevertheless extended. Another question left unanswered is why these particular domains (source and target) are linked, that is to say why those meanings are linked to the particular sense of smell and not, let us say, vision or any other sense.

In order to answer these questions some other processes, apart from those metaphorical ones proposed by Sweetser, should be taken into consideration. It is proposed here that those other processes are "*property selection processes*", to put it in another way, the physical smell, i.e. the first meaning of the sense of smell, has some particular properties which characterise it as such. These properties should be also present in the extended meanings of smell in order to conclude that these meanings are related to the sense of smell, and not to any other sense. However, it seems that not all the properties that characterise the sense of smell can be found at all times and in all meanings, but that a selection of those properties has taken place. It is to these property selection processes that we turn to now. But, first of all, the properties that define the sense of smell will be presented.

3.1. Prototypical Properties in the Sense of Smell

When we smell, we usually inhale air into our nostrils, we take a deep breath and let the air come inside us, towards our lungs. There is an inhalation of air from the outside to the inside. Hence, the property represented by the feature [+internal].

This process is not only carried out when we smell, but all the time, when we are breathing. Unless we close our nose, we are smelling all the time, but unconsciously. Thus, we can define the property [-voluntary]. A further explanation should be made in this case. As we have said before, there are three kinds of smelling: emission, perception with an active subject and perception with an experiencer subject. These three types of smell must be characterised differently in respect to this property. Thus, in the case of emission and perception with an experiencer subject, smell is indeed involuntary, as we are not consciously controlling it; hence, we have [-voluntary e] and [-voluntary p] respectively. Whereas in the perception with an active subject, the smell is voluntary and the property is [+voluntary].

Another characteristic is [+detection]. As we have said before, we are smelling all the time but we only become aware of it, either if we lose our olfactory faculty or if we detect a new, good or bad, smell. For instance, 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 later we recognise as coffee. After a while, we become used to the smell of coffee and no longer smell it cons-

ciously. But if somebody enters the room, that person will detect the smell of coffee straight away.

Another characteristic is that one is very rarely sure of what is smelling. That is to say, smells are difficult to identify immediately. When we use the sense of vision, for instance, if we see a dog, unless we have sight problems or we have never seen a dog before, we immediately recognise that entity as a dog. This does not happen with smell, we are never a hundred per cent sure that what we are smelling is one specific thing or another. Furthermore, smells are difficult to name. The fact that the sense of smell lacks an independent classification of smell similar to that of other senses such as taste (*sweet, bitter...*) was already pointed out by Aristotle, and in fact, the situation nowadays has not changed. 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*. Hence, we have the property represented by the feature [-discrimination].

Finally, smells are different for people, what for one person is a nice smell, for another could be bad or simply neutral. Smell is also cultural. That is why, it can be said that smell is [+subjective].

All these characteristics are present in the physical smell. If we accept that semantic changes take place from the concrete domain to an abstract domain, it can be said that these characteristics are the first properties that the sense of smell had, before extending its meanings to a wider scope; therefore, we will call these characteristics "*prototypical properties*" as they are the properties of the first prototypical meaning of the sense of smell.⁵

The prototypical properties that we have defined so far are:

- [+ internal]
- [± voluntary e, p]
- [+ detection]
- [- discrimination]
- [+ subjective]

This type of analysis should not be confused with Componential Analysis (Katz & Postal 1964, Katz 1972). What is proposed here is that the first prototypical meaning of the sense of smell, that is to say, its physical meaning can be defined in terms of characteristics, or what it is called here "*properties*". These properties are not present in all the extended meanings that the sense of smell can convey, there is always a selection in accordance with the characterisation of the particular meaning. In order to express all these aspects, properties are represented by binary features in square brackets. In this present approach, features are the format chosen to represent the proper-

(5) All these ideas about prototypicality are based on Eleanor Rosch's (1978) work on categorisation and prototypes.

ties that characterised the sense of smell, not the format for semantic primitives as in Componential Analysis.

Table 4 is a summary of the main meanings that the sense of smell has in the three languages of the sample, together with their properties. In this case, both 'guess' and 'suspect' have been included under the same slot. However, it must be taken into account that they do not have the same meaning, as it has been indicated before. They share the same properties here, but there is a [+negative] property that is present in 'suspect', but not in 'guess'.

Meanings	English	Basque	Spanish	Properties
1. physical smell- emit	+		+	{+prototypical} [-voluntary e]
2. physical smell-perception- active	+	+	+	{+prototypical} {+voluntary}
3. physical smell- perception- experiencer	+	+	+	{+prototypical} [-voluntary p]
4. trail something	+	+	+	{+detection} {+voluntary}
5. investigate	+	+	+	{+detection} {+voluntary}
6. guess, conjecture; suspect	+	+	+	{+detection} [-voluntary p] [-discrimination]
7. suggest	+		+	[-voluntary e] [-discrimination]

Table 4: Meanings and properties in the sense of smell

3.2. How Property Selection Processes Work

In the previous section, it has been seen how the properties that characterise the physical sense of smell are present in the different meanings that the olfactory verbs can convey. It is very important to notice the distribution of such properties in every extended meaning because in none of the extended meanings, the five prototypical properties are present at once, there is a selection of some of them in each case. This selection of properties is called here "*Property Selection Processes*" and it represents a formalisation of the metonymical character of metaphorical mappings, known as the "used" part of metaphor (Lakoff and Johnson 1980: 52; Johnson 1987: 106), the fact that only part of the structure of the source domain is projected onto the target domain.

For example, in the case of the meanings 'trail something' and 'investigate'. These two meanings share the same properties [+detection] and [+voluntary] and can be illustrated in the following sentences (20) and (21) in English respectively:

(20) The dog was sniffing the ground looking for the hare

(21) The police have been sniffing around here again (RCD)

In (20), the meaning of the verb of smell is still physical, whereas in (21), it is abstract. In (20), the dog was actually physically smelling the ground and following the trail (i.e. smell) left by the hare. On the other hand, in (21), the police are not using their noses to physically smell; although the same kind of action as in (20) is implied, in this latter example, it should be understood in a different manner, not in a physical but in a metaphorical way.

Therefore, my hypothesis is that from the original prototypical meaning, i.e. the five properties, through a property selection process, there is a choice of properties; this process occurs in both examples; however, in the case of (21), a further step takes place: that of metaphor; and that is why the meaning is no longer concrete but abstract. These processes are represented in Figure 1.

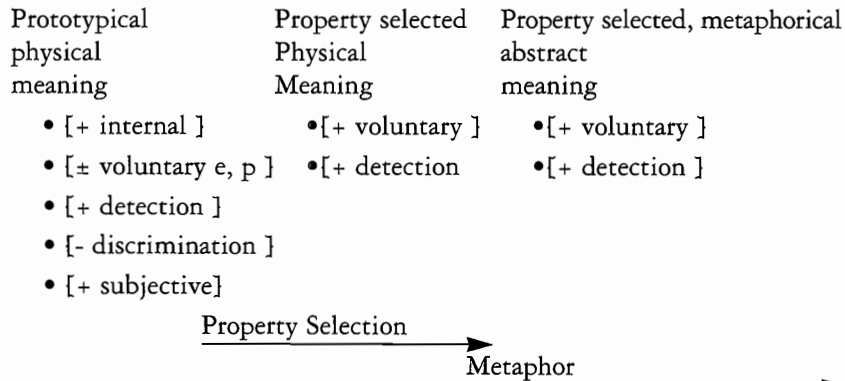


Figure 1: Property selection and metaphorical processes in meanings 4. and 5.

The same conclusions can be reached from the other two languages. For instance, in Basque:

(22) *Txakurra usnaka zebilen erbiaren bila*
 dog.ABS smelling was hare.GEN search.ABS
 'The dog was sniffing around looking for the hare'

In this first example (22), we have the physical sense of 'trail something', where only property selection process takes place. And then, in (23), where both processes property selection and metaphor are involved.

(23) *Bere gauzetan usnaka ibili ondoren, bera hiltzailea izan zitekeela usaindu nuen*
 his things.LOC smelling be after he.ABS murderer.ABS be
 could.COMP smell TRANS:1SG.PAST
 'After I sniffed around, I suspected he could be the murderer'

The same statements can be made about Spanish:

- (24) *El perro estaba olfateando 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'

This is the same case as (20) and (22) above: the physical smelling.

- (25) *Le han ordenado que busmee las cuentas*
 he.DAT have.3PL ordered that sniff:3SG.SUBJ the accounts
 'They have ordered him to investigate the office accounts' (HM)

And again, the metaphorical extended meaning in (25). The fact that the same processes applied to the three languages of the sample supports the cross-linguistic characteristic of these semantic changes.

4. Conclusions

In this paper, it is proved that the sense of smell has more metaphorical connections with the abstract domain than those identified by Sweetser, such as 'guess', 'suspect' and 'investigate'.

It is also shown that, although necessary, metaphorical processes are not enough to explain either all the extended meanings conveyed by the verbs of smell or the reason why these meanings are related to this sense in particular. A solution proposed here is the '*property selection process*', i.e. the selection of some properties from the set of prototypical properties that characterise the sense of smell. This selection occurs in all the extended meanings of these verbs and it is only in those cases when the meaning is abstract, that metaphorical processes take place.

The fact that these extended meanings, together with both property selection and metaphorical processes, are present in the three languages of the sample indicates that they are, as Sweetser predicted, not language specific but cross-linguistic phenomena.

5. References

- Buck, C. D., 1949, *A dictionary of selected synonyms in the principal Indo-European languages*, Chicago University Press, Chicago.
- Corominas, J. & J. A. Pascual, 1983, *Diccionario crítico etimológico castellano e hispánico*, Gredos, Madrid.
- Diccionario 3000 Hiztegia. Adorez 7*, 1996, Bostak Bat, Bilbo. (HM)
- Johnson, M., 1987, *The Body in the Mind. The Bodily Basis of Meaning, Imagination, and Reason*, Chicago University Press, Chicago and London.
- Katz, J. J., 1972, *Semantic Theory*, Harper and Row, New York.
- & P. M. Postal, 1964, *An Integrated Theory of Linguistic Descriptions*, MIT Press, Cambridge, MA.
- Kryk, B., 1979, "Some remarks on the verbs of perception in English and Polish", In J. Fisiak (ed.), *Papers and Studies in Contrastive Linguistics*, Center for Applied Linguistics, Poznań and Arlington, Va., VIII, 113-231.

- Lakoff, G. & M. Johnson, 1980, *Metaphors We Live by*, Chicago University Press, Chicago and London.
- Leech, G., 1971, *Meaning and the English Verb*, Longman, London.
- Michelena, L., 1990, *Fonética histórica vasca*, "Supplements of ASJU", Donostia.
- Mujika, L. M., 1982, *Latina eta erromanikoaren eragina euskarari. (Euskal lexikoaren azterketa bideetan)*, Sendoa argitaldaria, Donostia.
- Oxford English Dictionary*, 1986, Oxford University Press, Oxford (OED).
- Oxford Spanish Dictionary*, 1994, OUP, Oxford, New York, Madrid (OSP).
- Diccionario Retana de autoridades del euskera*, 1976, Biblioteca de la Gran Enciclopedia Vasca, Bilbao.
- Richmond Compact Dictionary*, 1995, Santillana, Madrid (RCD).
- Rogers, A., 1971, "Three kinds of physical perception verbs", *CLS* 7, 206-223.
- _____, 1972, "Another look at flip perception verbs", *CLS* 8, 303-316.
- Rosch, E., 1978, "Principles of categorization", In E. Rosch and B. B. Lloyd (ed.), *Cognition and categorization*, Erlbaum, Hillsdale, NJ, 1-49.
- Sweetser, E., 1990, *From Etymology to Pragmatics*, CUP, Cambridge.
- Viberg, A., 1984, "The verbs of perception: a typological study". In B. Butterworth, B. Comrie and O. Dahl, *Explanations for Language Universals*, Mouton de Gruyter, Berlin, 123-162.