TERMINOLOGY

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Unit II
Semantic aspects of terms

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Lesson 4: Monosemy, polysemy, homonymy and synonymy

4.1. Monosemy

Considering the alleged characteristics of terms (precision, emotional neutrality and stability), every term should be monosemic, but this only happens with the new terms (not altered by other meanings or connotations) if they were not generated using pre-existing words, specialised or not.

4.2. Polysemy, homonymy and paronymy

A term is polysemic when it has more than one meaning.
Two terms are homonyms when their etymology is different although their form is the same –both homonym terms represent different concepts.
Two terms are paronyms when they look similar (but they are different) because of their form or sound.

Homonyms can be homophones (same pronunciation) and homographs (same spelling). Some examples are as follows:

- Homophones and homographs at the same time:
    - bark: the characteristic short loud cry of a dog (from old English *beorcan*).
      Bark: the tough largely corky exterior covering of a woody root or stem (from old Norse *boţrkr*).
    - Stalk: the main stem of an herbaceous plant often with its dependent parts (from middle English *stalken*).
      Stalk: to hunt stealthily (from old English *bestealcian*).
    - Left: opposite of right.
      Left: past tense of leave.
    - Bow: to bend the head, body, or knee in greeting reverence, respect, or submission (from old English *būgan*).
      Bow: a weapon for shooting arrows (from old English *boga*).
      Bow: the forward part of a chip (from middle English *bowe*).

- Homophones and heterographs:
    - to, too, two
    - there, their, they're

- Homograps and heterophones:
    - desert (dɪ'zɜ:t): to withdraw from or leave usually without intent to return.
      desert ('dezət): arid land with usually sparse vegetation.

In a correct use of the language, paronyms do not represent any problem, although they may lead to a mistake if they are not correctly pronunciated or the receiver of the message does not recognise them. There could be a confusión between *alternately* and *alternatively*, *prolepsis* and *proslepsis, continuous* and *contiguous*.

Polysemy is very frequent, it is produced as a consequence of extending the meaning of a previously existing word to name a new thing, it means, a word with one (monosemic) or several (polysemic) meanings to adopt another meaning. In this way, polysemy allows to increase the number of named concepts without enlarging a lexicon or terminology.

A word can have several meanings in the standard register, in the standard register and in one or several specialised fields, or in one specialised subject. Terminology will only consider the specialised meanings, so there will be a difference in the treatment of polysemic and homonym terms by Lexicography and Terminology. In a lexicographic work (a general dictionary) all the meanings of a word are included, while in a terminology (a dictionary specialised in the lexicon of a subject) only the meaning or meanings related to the subject are included, omitting the rest of meanings.

- A word with meanings in the standard register and in a specialised field: *reactor*.
    - Standard register: one that reacts.
    - Chemical industry: a vat for industrial chemical reaction
    - Energy industry: a devise for the controlled release of nuclear energy.
      * Only if the word is used wit the two last meanings it will be considered as a term, and it will be included in the chemical or nuclear energy terminology respectively.
- A word with meanings in several subjects *ray*.
    - Geometry: any of a group of lines diverging from a common centre.
    - Zoology: one of the bony rods that extend and support the membrane in the fin of a fish.
- A word with several meanings in a subject: *arm*.
    - Anatomy: a human upper limb.
    - Anatomy: the part of the human upper limb from the shoulder to the elbow.

4.3. Synonymy

Two terms are synonyms when their meanings are similar or the same. Some authors make the difference between “synonyms” (exact meaning) and “quasi-synonyms” (approximate meaning). According to this, two synonyms can be used in the same text without modifying the general meaning of the discourse but the substitution of a quasi-synonym for another depends on the context. For instance, “aircraft” (a vehicle for travelling through the air) could be used instead “plane” or “balloon” in certain texts, but not in all of them, since “plane” and “balloon” are not synonyms.

Two terms with same or similar meaning, as in the case of polysemy, is a fact contrary to the alleged precision of terms and may lead to ambiguity in a specialised discourse.

Synonyms are generated in several ways:

- When research begins or important advances are carried out in a subject, it is necessary to name the new referents (objects, ideas). It is possible that this task is being developed simultaneously in different places, so a series of synonyms is generated. Within time, some terms are used more frequently than others, that may become erased form terminologies. Once the results of the research are shown, the generation of new terms can be coordinated in order to avoid more synonyms.

- It is possible that different research groups generate new names for their already exisiting research concepts to differentiate their research in relation to the object studied or the method applied.

- The standardisation of terminologies leads to the revision of nomenclatures which forces the scientists to update the lists of names. So, for a duration of time, there will be dictionaries with the old names and the new names to represent the same concepts. For instance, after the last revision of the chemical nomenclature, a new one is generated that exists together with the old one for a period of time and it is possible to find pairs of terms, such as “carbon dioxide” and “carbonic anhydride” to name the same referent (CO_2), but only one of them is correct after the revision, so they cannot be used as synonyms although they have the same meaning.

- Sometimes a language is contaminated with unnecessary loans and calques from other languages, which societies have an important technological and cultural influence (currently American English). For instance, in Spanish the term *aerogenerador* is used together with the calque *aeroturbina*, from the English expression “wind turbine”, though the last one is used much less frequently.

4.4. Communicative dimension and terminological meaning

Terms become completely meaningful when they are inserted in a text with the purpose of establishing communication. The author of such a text uses each term with a specific meaning, a sole meaning. In this way, the communicative dimension of the term allows clearing up potential ambiguities due to the semantic situations explained above. However, there may be a certain grade of imprecision, but a term in a context is considered much more precise than a single word.

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Lesson 5: Hyperonymy-hiponymy, holonymy-meronymy

5.1. Hyperonymy-hiponymy

Hyperonymy and hiponymy are semantic relations of lexical units deriving from a hierarchical classification of the referents they represent.

- A hyperonym is a word whose meaning contains the meanings of other words (hiponyms) or, from the ontological dimension point of view, a hyperonym represents a referent, of which there are several kinds (the name of each kind is a hipnonym).
- A hiponym is a word whose meaning is contained in the meaning of another word (hyperonym), this means, a hiponym represents a referent that is a certain type of a hierarchically superior referent in a sorting of referents.
- A co-hiponym is a word whose meaning is at the same level as another word in relation to a hyperonym. Two co-hiponyms represent two types of referents of the same referent.

If Y and Z are hiponyms of X	→	Y and Z are types of X Y and Z are co-hiponyms of each other X is hyperonym of Y and Z
If Y is hiponym of X and Z is hiponym of Y	→	Z is hiponym of X Y is hyperonym of Z X is hyperonym of Y and Z

For instance, is we consider all the tools, hammer, adjustable spanner, and screwdriver are types of tools; so the terms hammer, adjustable spanner, and screwdriver are hiponyms of the hypernonym tool and are co-hiponyms of each other.

There are two kinds of screwdrivers, slotted and Phillips screwdrivers. So a slotted screwdriver and a Phillips screwdriver are co-hiponyms of each other and hiponyms of the term screwdriver and of the hypernonym tool.

According to these hyperonymy-hiponymy relations, by adding some more tool names, we can establish the following classification:

	hammer	
	screwdriver	Phillips screwdriver slotted screwdriver
	spanner or wrench	adjustable spanner open-ended spanner or open-end wrench ring spanner or box-end wrench Allen wrench, hex key or Allen key

In a text, we find hyperonymy-hiponymy relations when there are classifications or when the author speaks about different kinds of referents in relation to other referents.

5.2. Holonymy and meronymy

Holonymy and meronymy are semantic relations among lexical units deriving from the description of a whole that is made up of several elements (parts of a machine, stages of a process, etc.).

- A holonym is a word representing a referent made up of several parts, each of them with a name, that is a meronym.
- A meronym is a word representing a referent that is a part of other referent whose name is a holonym.
- A co-meronym is a word representing a referent that, with others, whose names are co-meronyms of each other, are parts of another referent, represented by a holonym.

If Y and Z are meronyms of X	→	Y and Z are parts of X Y and Z are co-meronyms each of the others X is holonym of Y and Z
If Y is meronym of X and Z is meronym of Y	→	Z is part of Y Y is part of X Y is holonym of Z X is holonym of Y and Z

For instance, if we consider the holonym arm, defined as upper limb –from the shoulder to the end of the fingers–, several regions can be observed; the names of such regions are the meronyms arm –from the shoulder to the elbow, here arm is a polysemic word–, elbow forearm, wrist and hand, all of them are co-meronyms each of the others. All them are made up of muscles and bones, among other components, so the names of the bones radius and ulna are meronyms of forearm, that is a holonym of them both and, at the same time, a meronym of arm.

In this way, by naming all the meronyms, on different levels of the holonym arm, we obtain a description of the arm (holonym), as well as a description of every arm's component.

If we only consider the regions of the arm and its bones, we can establish the following relation of holonym-meronym on several levels:

	arm	humerus		
	elbow			
	forearm	ulna radius		
	wrist	carpus	carpal bones escaphoid lunate bone triquetrum bone pisiform trapezium trapezoid capitate hamate	
		palm	metacarp	metacarpal bones
		finger thumb index finger middle finger ring finger little finger	phalanx / phalanges	

We also find two relations of hyperonymy-hiponymy in this table of holonyms and meronyms:

- The carpus if is made up of eight carpal bones, each one with a name. The name of each carpal is hiponym of the hyperonym carpal, since each of them is a specific type of carpal bone.
- Similarly, the name of each finger is a hiponym of the term finger. The names of the five fingers are co-hiponyms of each other.

We observe relations of holonymy-meronymy when there are descriptions, since in this case the elements that make up what is described are named.

5.3. Classification and description

The key to distinguish between holonymy and hyperonymy is to realise if the author of a text the speaks about “kinds of” or “parts of”. An adjustable spanner is a “kind of” spanner or a “kind of” tool, while a finger is “part of” the hand and not a “kind of” hand.

Meronymy-holonymy is as important in the system of a language as hiponymy-hyperonymy. The first semantic relation allows us to describe and the last one to classify. However, there is no posible classification without description, since every classification is developed on the basis of descriptive information.

Consequently, the presence of hyperonymy in a text is due to a classification and the holonymy derives from a description. In other words, when something is classified in a text, it will be possible to find hyperonyms and hiponyms, and when the author describes a referent, it is probable that holonyms and meronyms are used.

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Lesson 6: Terminological fields

6.1. Definition of field

It seems that there is not a concept of field that the linguistic community agree on, and it is even worse with the concepts of the different kinds of fields, according to the differences in the definitions and explanations proposed by some authors. However, we can state that a field is a set of words grouped because of the existence of a relation that establishes a structure in a certain sphere (Dubois *et al*., 1986: 91-93). In any case, the nature of the relation varies, depending on the scholars.

What is the nature of the structuring of a domain? What are the word relations in such domain, linguistic or conceptual? Dubois states that a purely linguistic structuring of the lexical fields is possible, independent of the conceptual structure.

Matthews (1997: 128) establishes in the frame of Linguistics a net of paradigmatic relations to make up a field, although he also includes a conceptual dimension inside that net, considering, in this way, a connexion between the linguistic and conceptual aspects.

Chalker and Weiner (1994: 150) pay attention to the semantic aspect to define a field: a group or system of referents (not words nor concepts) with some aspects of meaning in common.

In any case, there is a close link between the cognitive, linguistic and ontological aspects, so every linguistic relation has to take into account its conceptual and referential image, that is why these three types of relation are inevitably generated and developed in a parallel way.

6.2. Types of fields

At the beginning of this lesson we commented the existence of several fields that are different and recognizable, although they are not always differentiated. Dubois (1986: 390-391) says that in the usual terminology they do not establish the difference between lexical field and semantic field: in both cases they speak about the meaning area covered by a word or a group of words. Continuing with this idea, we can observe that the definition of semantic field in the *DRAE* could easily be the generic definition of field: a group of lexical units of a language including terms that are linked because they refer to similar realities or ideas. One more example of this confusion between different fields is the definition that Chalker and Weiner (1994: 150) propose for a field, in which they use the expressions lexical field and semantic field as if they were synonyms. Next, we are going to present and explain three types of fields: lexical fields, subject fields and semantic fields.

Lexical field

For Lewandowski (1982: 46), a lexical field is an ordered group of words that have become related because of their meaning; in a field each word is perfectly

defined and characterised by the rest of words of the group, it means that the value of each word is established by the whole group of words in the field. This author proposes as an example the lexical field “to go”, made up of the verbs “to walk”, “to stroll”, “to ride”, etc.

The semantic relations to group the different words in a field depend solely on the meaning of the words, that is why this type of field does not need to be defined.

Subject field

We can define a subject field as a group of words that are related because of the domain in which they are used, it means, depending on the subject framing the words. If the framing subject is a specialised domain, then the words in the field are terms. In this sense, we could say that a subject field and a terminology (the group made up of all the words use in a certain science) are the same.

This kind of field does not need to be defined, since the domain or topic which the words belong to is already known, actually there are several national and international classifications of specialised domains, as UNESCO domain classification or the European Community Classification of Economic Activities (NACE) and others.

The lexicographic and terminological works usually utilise the subject fields to sort the terms.

Semantic field

Abraham (1981: 88) defines semantic field as a group of words belonging to the same linguistic system and the same part of the discourse together with the meanings assigned to them. For Lewandowski (1982: 46), a semantic field is a group of semantic relations made up of linguistic units whose meanings are updated in the discourse they are used in. It means, the words in a semantic field have a relation because they are part of a certain discourse and because they share part of their individual meanings in such discourse. From this we can conclude that a word (polysemic or not) in a semantic field has only one meaning, the one that the author gives to it in the discourse. This relation between word and text in which it is inserted establishes a dramatic difference between the semantic field and the lexical and subject field, in which the relations are established in accordance to the meaning of the terms and the specialised domains respectively and not as a consequence of the discourse that outlines the meaning.

As a semantic field is constituted in accordance with the functions of the words in a discourse, it is possible to use the semantic fields to analyse a text through its words. If we group the terms of a specialised discourse into semantic fields we can reach the following objectives in order to understand the contents of the text:

- To concentrate the specialised information of the specialised text, represented by the terms used in it. Most of the content of the text is summarised in this collections of terms.
- To group the content into meaning blocks, as the terms are sorted into semantic fields, establishing semantic relations among them.
- To define semantic fields in a free way, in accordance to the contents of the text and the analysis of it we want to bring out. This is a difference with the lexical and subject fields in which the meanings of the words and the domains they belong to predetermine their classification. A direct consequence of the flexibility to establish the semantic fields is the need of an understandable and precise definition of the fields.

Once the terms of a text are classified into semantic fields, it is possible to go further in the text analysis in order to reach a higher level of comprehension: establishing semantic relations among the semantic fields to make up a semantic tree.

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Lesson 7: semantic trees

For us, a semantic tree is a hierarchical structure of all the semantic fields defined from the terminology of a text that are related following similar semantic criteria to those applied to group the words or term into such semantic fields. With a semantic tree it is possible to represent in a graphical way the ideas generated after the reading and comprehension of a text. The processes of acquisition and conceptual organization of the text can also be represented in the semantic tree.

The hierarchy of the tree's fields answer the Trier's concepts of macrofield and subfield (in Abraham, 1981: 88). According to them, in the sorting of words into fields, we can establish fields (macrofields) in which two or more semantic fields that share semantic features can be grouped. It is also possible to define several fields (subfields) inside another that is hierarchically superior.

In the hierarchic structure of the semantic field, several subordinating levels are established. As we go down from a level to another, we advance in the direction of the specificity of the semantic criteria used to differentiate between one field or subfield and another untill we reach the level of the terms, the last level in the tree, with the highest grade of semantic difference. At the opposite end, no matter how many levels in the semantic tree of a text, there has to be a sole global macrofield, since all the terms of a text are used for the transmission of a topic, thus, all of them are semantically related around this topic.

The semantic tree takes root in the soil of the cognitive structures and conceptual or cognitive maps. The cognitive structure is a codification system describing and explaining the structure and organization of knowledge. It leads the attention, the interpretation and expectations of the individual, it means, it prepares the observer to accept certain type of information and guides his exploration (Neisser, 1976: 46-58). According to the basic assumption under this concept, the previous experience of the individual has an influence in how he perceives, understands and remembers the new information.

The conceptual map offers more information than the cognitive structure, since it allows bringing out a visualisation of the location of the ideas in a text as well as the relations among such ideas. It is a reasoning system that allows planning the text analysis and solving comprehension problems. The conceptual map making depends on the analysis we want to develop. They are incomplete, schematic, some of their parts become magnified and others reduced in comparison to the reality they deform and simplify; in addition they have a dynamic and executive component aimed at action (Carreiras, 1986: 64).

Some authors propose the concept of a semantic map, as an evolution towards the semantic tree. Semantic maps are a categorisation of the ideas in a text. Heimlich and Pittelman (1990) propose the use of these maps to develop the lexicon, to pre and post-reading, and to identify the main and secondary ideas of a text.

In the semantic tree, the categorisation of ideas is established with the

terminology of a text that is made up of all the specialised lexical units, each of them more real and easy to use than the “ideas”. Terms are grouped into fields establishing semantic relations. Fields are connected following the same relational logic based on the terminological meaning. Consequently, the lexical level is the starting point of these relations ending in the textual level and then the hypertextual level when we establish relations between two or more trees developed from texts with the same or similar topic and generated in the same domain and register. Thus, it is an analysis from the specific to the general, from the subordinated to the subordinating, from the understandable to the complex.

Once the semantic tree is elaborated, we can obtain conceptual and semantic information. The conceptual information shows “what”, it means, the concepts and the conceptual structure of a text (textual level) or a science or branch of a science (hypertextual level), as well as the importance and specialisation of the concepts. The semantic information shows “how”, the relations of the meanings and the ideas in the text (hierarchy, types). The interpretation of both kinds of information in the semantic tree allows a knowledge that is superior to the initial understanding, all in all, a deep knowledge of the text and the generation of the semantic units.

Graphically, the semantic tree is organised as a semantic-conceptual map. There are points of reference or nodes (in our case the names of the semantic fields) and paths, the lines connecting the names of the semantic fields and the terms. The paths are useful to expand and integrate the space knowledge, connecting perceptive experiences of distant terms in the text (Carreiras, 1986: 67).

In the semantic tree, differently to cognitive structures and conceptual and semantic maps, all the terms of a text are grouped into semantic fields, that are established in accordance with the contents of the text, so it is possible to quantify the importance of each content counting the terms used to explain it. In this way, a semantic field also has a topographic component that can be used to divide the text into sectors representing different ideas.

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