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METAPHOR TRANSLATION IN ELECTRONICS TERMINOLOGY

Introduction

In the process of establishing links between the world and the language of science, metaphors play a very important role. They are considered to be the main mechanism through which we comprehend abstract concepts and perform abstract reasoning. Analogy and metaphor are therefore frequently described as "*central to scientific thought*" (Gentner and Jeziorski, 1996:447)

New concepts issuing from our experience are structured in the first place on the basis of their interaction with other concepts. These conceptual correspondences or mappings usually follow a subconscious pattern of comparing items from different domains which share some minor but obvious characteristics. G. Lakoff sees metaphor not as a figure of speech, but as a mode of thought defined by a systematic mapping from a source to a target domain and characterized by: systematicity in the linguistic correspondences; the use of metaphor to govern reasoning and behavior based on that reasoning; the possibility for understanding novel extensions in terms of the conventional correspondences

Over the centuries, however, many great thinkers have banned metaphor from scientific use. Empiricist philosophers suggested that metaphorical use of language might lead to imprecision and ambiguity, thus misleading and distorting the judgment. This view is based on empiricist belief that the scientific concepts are acquired through accurate sense perceptions in such a way that they correspond to strictly defined entities in the world.

Consequently, scientific language was believed to deal only with strictly defined categories. Application of analogy and metaphor was therefore considered to blur the accuracy of knowledge representation.

Structural linguists, similarly, regard the lexis of science as being strictly monosemous. Coseriu believes that technical vocabulary is simply a nomenclature and as such not structured on the basis of language, but rather on the basis of extralinguistic reality, namely the objects of the discipline in question. He claims that "*since, in technical usage the words area really the representatives of the "objects", signification" and "designation" coincide in this case whereas in the domain of the "natural" language they must necessarily be separated*." (Coşeriu, 1981:48)

Accommodation of scientific language to the development of science is a continuous process. The meanings of terms constantly change as the amount of knowledge about them increases, discovering ever deeper levels of cognition. Similarly, scientific theories are constantly being replaced by more revealing and more accurate theories. According to the empiricist view, metaphor might distort the scientific thought by conveying wrong ideas and lead to imprecision and vagueness due to its conceptual open-endedness. Quite to the contrary, metaphor is today accepted not only as a figure of speech, but also as a mode of thought and a valuable, even indispensable vehicle for conceptualizing and conveying new knowledge. This, Boyd claims: "*The use of metaphor is one of many devices available to the scientific community to accomplish the task of accommodation of language to the casual structure of the world. By this I mean the task of introducing terminology and modifying usage of existing terminology*." (Boyd, 1996:483)

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Lakoff develops the "experimentalist" account of knowledge, claiming that knowledge, like truth, is relative to understanding. We structure our reality by our conceptual schemes. In this process some kinds of experience are structured preconceptually. However, in domains lacking such preconceptual structure, we understand experience via metaphor. By mapping properties from sources to target domain, metaphors conceptualize new knowledge. However, they have another function: they also reveal aspects of reality as yet unseen, thus influencing our thought process.

A variety of metaphor types are encountered in the language of electronics. We shall compare the metaphorical models of English and Romanian electronics terminology in order to point out the mechanism of structuring the metaphorical models across languages.

Metaphorical expression in the electronics lexis

The analysis of the electronics leis will show that a great number of electronics terms are of metaphorical origin. These metaphors are predominantly based on correspondences in our experience. In some cases they are also based on image similarity. Thus, Lakoff speaks of "*image metaphors*", defining them as "*isolated one-shot mappings from a single conventionalized mental image*" (Lakoff, 1993:29)

Take for example the word electricity. Six hundred years BC a Greek philosopher noted that the amber ("electron" in Greek) attracts light particles, if it rubbed with a cloth. This phenomenon remained a curiosity for twenty two centuries, but in the seventeenth century, when scientists started studying the forces acting between certain materials, the phenomenon got its name after amber. A century later, concepts of positive and negative electricity were introduced, again using metaphors. *Lighting* is a word created by metaphorical extension, due to the fact that a century earlier Benjamin Franklin noted that lighting was a form of electricity. Thus, *condenser* (Rom. condensator) was initially called "*lighting collector*" (Rom. comutator de iluminare), "*electromagnet*" was "*lightning magnet*" (rom. magnet de aprindere) and *electric field* was "*lighting circuit*" (rom. circuit electric luminos). These terms were used for some time in Romanian electronics terminology, but they did not last long and were soon replaced by internationalisms such as *electromagnet, câmp electric, condensator* etc.

If we continue observing the lexeme *electricity*, we shall see that today it has several meanings, one of which is synonymous with the lexeme "electric current" or shorter "current". Here is another metaphor among the basic lexemes of electronics science, created in analogy to the current of water or current of air on the basis of common characteristics of motion, since electric current basically involves the motion or flow of electric charges.

Such metaphorical expressions, according to Anderson's definition "*involve the application of a word or expression that properly belongs to one context to express meaning in a different context because of some real or implied similarity in the referents involved*" (Anderson, 1964:53). Some authors express doubts whether such expressions might be nothing more than the cases of catachresis, i.e. using expressions to fill in the gaps in the lexicon (cf. Black 1996:25).

Our examples from the electronics lexis have shown that other metaphors are frequently structured around the basic metaphorical expressions, thus creating a set of correspondences between source and target domains. In our example of electric current we shall further have *current source*, a "*point from witch the current flows*,"*current drain*" the amount of current a circuit draws from a power supply, "*ripple current*" presence of an alternating current

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component in a direct/current signal, "*leakage current*", the unwanted stray current that flows across the surface on an insulator or an insulating material, etc.

Contrastive analysis of metaphorical models in English and Romanian

a. Parallel mappings

If metaphorical models in English electronics lexis are compared to the Romanian ones, a number of equal mappings will be found in the two languages. If we take, for example, the above described metaphorical model of *current* and the lexemes grouped around it, we shall prove that most of them have parallel metaphors in the two languages:

Current flow - curent de scurgere
Current source – curent electric emițător
Current drain – curent de descărcare/debit
Leakage current – curent de scurgere
Ripple current – curent de ondulație; curent al zgomotului de fond;

Parallel metaphorical expressions can be found in all branches of the electronics lexis in the two languages:

Field – câmp	*wave – val*
Avalanche – avalanşă	*threshold- prag*
Branch – ramificație	*bridge - pod*
Bundle – fascicul	*stack - stog*
Head – cap	*loop – buclă, spiră*
Node – nod al unei rețele	*shell – înveliş electronic*
Fiber – fibră	*grass – ondulații ale bazei de timp datorită zgomotului electric*

If we look at definitions of the given lexemes in electronics dictionaries, we shall see that their conceptual and semantic productivity is based on analogy. One or more features of the source concept are integrated to produce a new concept and its expression, e.g.

Grass -" the pattern produced by random noise on an A-scope; it appears as closely spaced, sharp, constantly moving pulses on the base line"

Shell - "a group of electrons having a common energy level that forms part of the outer structure of an atom"

In the first example the metaphor is created on the basis of similarity between grass and "*closely spaced, sharp, constantly moving pulses*". In a second example, however, the mediator between the source and the target concepts is the metaphorical model of atom, in which the groups of electrons associated to the *nucleus* are logically described as *shells*.

b. Divergent metaphorical models in the two languages

Contrastive analysis of metaphorical models in English and Romanian electronics lexis have parallel structures in the two languages. However, closer examination will reveal that a particular metaphorical model rarely overlaps in all its parts. Thus, in a number of examples the given metaphorical model was found to be more consistently applied in English than in Romanian. In English, for example, the *current flow* may be *high* and *low*, like a current of a river:

In the forward- bias region, *current rises* rapidly…, and is quite high.
Current in the reverse-biased region is usually much *lower*.

In Romanian translation, however, we speak of *little* and *big* (magnitude) *of current*. Similar differences can be found in another metaphorical model, in which the characteristics of human beings are attributed to electric charges, as seen in the following examples:

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1. When an electron *meets* a hole, the broken *bond* is re-established
2. When an electron moves randomly about in the crystal, the possibility is that will *meet* a hole.
3. The number of electrons *released* depends on frequency.
4. Electrons detach themselves and *wander at random* within the crystal lattice.
5. Electrons acquire sufficient energy *to break the bonds and jump into* the conduction band.
6. Electrons reach sufficient speed *to escape* from surface of the conductor.

In the Romanian translation, a great part of the metaphorical component is lost. Thus, in Romanian, *electron* does not *wander at random*, but it "*moves chaotically*", it does not *escape*, but "*leaves*" the surface of the conductor. The given examples illustrate the case when one language uses the metaphor where another language uses it less consistently, or does not use it at all.

In a number of cases we shall find another type of divergence in a metaphorical structure of the two languages. Both languages use metaphors to describe a conceptual category, each language, however, using a different metaphor. Thus we have examples of lexemes in electronics lexis of the two languages:

horn – pâlnie	*pin* – ac cu gămălie
lobe – petală	*reed* - foiță
beat – licărire, clipire	

If we analyze the conceptual structure of the given lexemes, we shall discover that, although different, metaphors in the two languages usually point at the same or at similar features of the conceptual category.

Lexemes *reed* and *foiță* (*little leaf* or *thin leaf*), defined as "*a thin bar located in a narrow gap and made to vibrate electrically, magnetically or mechanically by forcing air through the gap*", are structured on the basis of the fact that something is THIN and VIBRATE.

The feature of being WIDENED at one end is the basis of parallel metaphorical lexemes *horn* and *pâlnie*: "*a radiating device that is essentially a cylindrical or rectangular pipe whose surface flares from a narrow entry to a wide exit*".

Lexemes lobe and petală ("*petal*") are created with reference to the feature of a PARTICULAR SHAPE. They are used to denote "a *figure such as circle or ellipse enclosing an area of intensified response".*

If we accept the view that the semantics of a word may be defined as a combination of different types of meaning, we could say of the above pairs of metaphorically created English and Romanian lexemes that they have the same conceptual, but different associative meanings, since they are structured by different metaphors.

Conclusion

Once we have rejected the empiricist conception of linguistic precision and accepted the dependence of scientific knowledge on our interaction with the world, we can embrace the idea of vital function metaphors in scientific thought as a basic mechanism which helps us to understand abstract concepts by means of concrete concepts. In the process of structuring our experience, metaphors help us to structure categories, concepts and terms that will serve as vehicles of thought and will both enable communication of existing knowledge and encourage further research and discoveries.

Analysis of the electronics lexis has revealed a great number of expressions of metaphorical origin, belonging to different metaphor types, according to patterns of their conceptual and semantic features.

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The comparison of English and Romanian metaphorical models has revealed patterns of similarities and differences between the two languages on this level. The analysis has shown that most metaphorical models have parallel mappings in the two languages. Starting from Newmark's strategies of rendering a text from a source language into a target language, we may argue that, in the case of parallel mappings existing between the two languages, a translator should reproduce the same image in the target language. (see section **a**). However, a closer examination reveals that there is rarely a consistent overlapping of all elements of a metaphorical model in both languages. Thus, in a number of cases the metaphorical model was found to be more consistently applied in English than in Romanian. (see section **b**). Another interesting situation is that in which characteristics of human beings are applied to the electric charges. A closer examination of the six sentences highlighted the use of another strategy of translation i.e. to replace the image in the source language with a standard target language which does not clash with the electronics terminology of the target language (see section **b**). In another type of divergence the two languages use different metaphors to conceptualize the same experience. The comparison of these metaphors reveals some traits of the fundamental conceptual mechanism of metaphorical mappings in the scientific lexis. It is worth mentioning that in the examples employed for different purposes, we could also demonstrate the use of the metaphors at different levels: noun phrases (see section 2 and 3a), adjective and verb phrases (see section 3b).

The examples of metaphorical patterns used in the electronics lexis have shown that in the process of creating metaphorical mappings, there is a rich interaction between the language and the world. This interaction could be adequately expressed by the question put by Kuhn: "*Does it obviously make better sense to speak of accommodating language to the world than of accommodating language to the world than of accommodating the world to languages? Or is the way of talking which creates the distinction itself illusory? Is what we refer to as "the world" perhaps a product of a mutual accommodation between experience and language?"* (Kuhn 1996: 541-542).

Whatever the answer, it is obvious that language provides a key which helps us unlock, one by one, the doors of cognition.

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REZUMAT

TRADUCEREA METAFOREI ÎN TERMINOLOGIA ELECTRONICĂ

În procesul de stabilire a legăturii dintre lume şi limbajul ştiinţei, metaforele joacă un rol foarte important. Acestea sunt considerate a fi principalul mecanism prin care înţelegem şi elaborăm concepte abstracte. Un tip aparte de metafore sunt reperabile în domeniul terminologiei electronice. În lucrarea de faţă, ne propunem să comparăm modelel metaforice din cadrul termonologiei electronice româneşti şi engleze pentru a puncta mecanismul de structurare a acestora.

Cuvinte cheie*: terminologia electronică, metaforă, model metaforic*

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