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Metaphor from the Derivational Perspective

Larisa M. Alekseeva & Svetlana L. Mishlanova

Abstract The article focuses on the derivational perspective of metaphor studies. Derivation is regarded as a complex cognitive process, represented within speech activities. In this sense, derivation is viewed as a universal process of language units' production according to the rules of text-formation. The basic feature of the derivational approach to the mechanism of metaphor is determined by the inner syntax, especially by the principle of contamination of two sentences – introductive and basic, which fulfill different functions. In this paper we shall present a theoretical account of metaphorization as a universal derivational process controlled by means of such laws, as incorporation, contamination and compression. We take as basic the premise that metaphor is a more complicated process than it is described in traditional theories, since it is dependent on cognition and knowledge communication. In contrast to the traditional approaches, metaphor is regarded here as the result of combination of two pictures of the reality, referential and imaginative. We believe that derivatology generates a new knowledge about metaphor mechanism and metaphor modeling. Comparing to linear models of metaphor, the derivational model is considered to be a network model. The latest derivatological ideas about metaphor enrich the concept of metaphor taking into consideration that it has to be studied not in isolation, but within a broad frame of text, discourse, cognition and communication.

Keywords Derivation theory, metaphor, mechanism of metaphor, introductive sentence, basic sentence, metaphor models, tropes

1 Introduction

Metaphor as a research subject has entered the contemporary discussion from a variety of perspectives and has already mapped its own research field. In recent years, everything connected with metaphor is very much in vogue. Modern theory of metaphor is a rapidly developing branch of knowledge with a vast scope of views (cf. e. g. Mac Cormac 1985, Kövecses 2000, Cienki 2008, Andriessen/Gubbins 2009, Steen 2009, Alekseeva/Isaeva/Mishlanova 2013, Wood 2015, Alekseeva/Mishlanova 2016). At the modern stage of knowledge development our understanding of metaphor has greatly changed. Metaphor appears to be a more complex and salient object of study than it has been viewed before. Metaphor was initially considered as a transfer or exchange of two meanings – literal and transitive, but this statement evolved to include a more interactive approach (cf. e. g. Cooper 1986, Ricoeur 1986, Wood 2015). In recent years, linguists have come to several important suggestions about the active role of metaphor in the building of pictures of the world by individuals and about its contribution into the process of integration of human verbal and conceptual systems (cf. e. g. Charteris-Black 2004,

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Cienki 2005, Cameron 2007a, 2007b, Andriessen 2008, Song 2011, Sullivan 2013). As a result, metaphor has become a research object not only in linguistics, but also in such spheres as psychology, cognitive sciences, theory of artificial intelligence etc. It has progressed even further to the view that it is a process in which meaning is created simultaneously among people (cf. Kastberg 2010, 2011).

This fact causes a problem of discussing metaphor on various theoretical foundations. For many years metaphor has been researched primarily as a semantic phenomenon (cf. Morgan 1980, Ricoeur 1986). In this perspective, it was regarded as a simple shift of meaning, or interaction of literary and figurative meanings. This is a so-called external description of metaphor, since the structure of the text, where metaphor was used, and its functional reconstruction were not taken into consideration. In contrast to traditional semantic approaches to metaphor, we take as basic the premise that metaphor is a more complicated process than it is described in traditional theories, since the nature of metaphor is directly dependent on human thinking. The roots of this premise go into a vast theory of derivation.

In recent work on metaphors, the statement that metaphor is a cognitive process that allows one domain of experience, the target domain, to be reasoned about in terms of another, the source domain (Lakoff/Johnson 1980) has been adopted (cf. e. g. Kövecses 2000, Pragglejaz Group 2007, Steen et al. 2010). This idea has turned into a persistent theme which has undergone a substantial progress. Nevertheless, a more ambitious thesis concerning metaphor nature was advanced ten years before by Leonid N. Murzin (Murzin 1972a).

Our research touches this very important, yet less known to the majority of linguists, linguistic conception termed *derivatology* as a dynamic view of language. The fundamental problem, to which this approach gives rise, is centered on the question about production of various language units within speech activities. Derivatology has emerged as a response to structuralism and to the static approach to word building.

More than forty years ago the first publication, devoted to derivation as the main trend in the research of language dynamics and language units' production, appeared (Murzin 1972a). However, the derivational ideas about metaphor were evaluated only in recent years within the framework of cognitive linguistics.

In order to introduce the derivational view of metaphor, we would start with a brief history of the derivational school from which derivational theory of metaphor has emerged.

Derivational theory was elaborated in the 1970s. It holds that all language units are products of text-formation. The core of derivational theory amounts to syntax. The interaction of syntax and language units' production has been researched from many perspectives, but still much of this central area remains unexplored. Leonid Murzin's contribution to this issue presents his own view on syntactical relations as the foundation of language units' production.

Within this perspective, the meaning of the term *derivation* is central in the theory content. There are two possible views on derivation. From a narrow perspective, it refers to one of the ways of word-formation. The second view is quite different from the previous one. Derivation is to be taken in the broad sense, i. e. as the subject of derivatology, or a dynamic discipline, which deals not with already formed words, but with the process of newly born language units. A broad view of derivation is connected with man's speech activity. This process is regarded as a complex phenomenon, linked with the real world and its reflexion in human mind. By derivation in the latter sense Murzin meant natural communicative acts, resulting in production of speech units (texts, word-combinations, lexical derivatives, etc.) which form the secondary (meta-, derivative) level of language units, including metaphor.

In the 1970s Murzin initiated a long line of assumptions about the nature and mechanism of metaphor. In 1972, Murzin in the article "The formation of metaphors and metonymies as a result of derivation of sentences" put forward the suggestion that metaphors were founded on syntax (Murzin 1972b: 362–366). In so doing, he applied derivational theory to specific cases – metonymy and metaphor mechanisms. He seeks to show the way in which these tropes appear in speech. He demonstrated that these two mechanisms were founded on syntactical processes. According to Leonid Murzin, metaphor is the result of a complex syntactic process of language units' production, the representation of which may be comprehended only with the help of universal laws of text-formation.

It should be stressed that nowhere in the world linguistics derivation theory has been taken as a starting point of metaphor formation. This theory provided a view of metaphor from the point of view of its mechanism. Summing up the above introductory remarks, we hold that the peculiarity of the derivatological view of metaphor is that it has to be studied not in isolation, but within a broad frame of text, discourse, cognition and communication.

2 The foundations of the derivation theory of metaphor

A further development of derivation took place in the work "Syntactical derivation", published by Murzin in 1974. This research was done within the frames of language dynamics. Murzin started with the suggestion that besides the taxonomic relations there was another type of relations – derivational. Murzin pioneered the study of derivation in which various speech units, including metaphor, obtained syntactical interpretation.

There are two periods in the derivational perspective of metaphor at Perm school: 1) 1972–1999 – the discovery of metaphor mechanism, viewed as the analogy of text-formation, and 2) from 2003 until now – the formation of metaphor theory as the foundation of discourse. The researchers of the two periods develop a specific derivatological idea of metaphor starting with generativism to semantics, through text-formation, semiotics, discourse analysis and finally reaching cognition and knowledge communication. What is remarkable for the derivatologists, who come after Murzin's theory, is the metaphor mechanism, developed from the category of analogy to the modern view of interiorization and exteriorization of professional knowledge from the discourse.

The derivation theory has been worked out at the time when transformational syntax was in progress. Considering this, it should be clear at this point, that there is a certain association of the derivational language model by Leonid Murzin with the postulates of transformational grammar of Noam Chomsky.

The common features of these two doctrines are the following:

- Combination of sentences is under consideration.
- Derivation is regarded as the main mechanism of this combination.

However, there are basic distinctions between these theories, which become vivid at Figure 1.

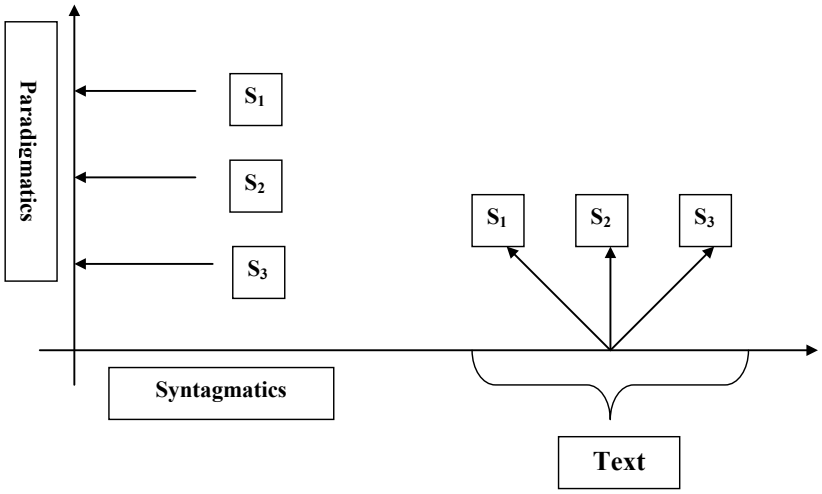

Figure 1: Distinctions between generative and derivational theories

Within this scheme, transformational (generative) grammar is referred to as paradigmatics. That means the following:

- the material under consideration is limited;
- the final aim is the derivation of sentences linked paradigmatically;
- the text is out of the model.

Unlike the previous, derivational theory refers to syntagmatics, since it deals with text-formation as the foundation of language units' production.

It is noticeable that Murzin started the building of derivation theory of metaphor within semantics and later came to syntax. To have a clear understanding of what derivation is, we will discuss the concept of an *extended seme (feature)*. By this term Murzin means such kind of semes which fulfill syntagmatic functions, i. e. providing sentence connectivity and integrity (Murzin 1974: 19).

An analogous category may be found in the works by French linguists Bernard Pottier (1963) and Algirdas J. Greimas (1996), who considered *classemes* as phrase elements. Greimas performed a contextual analysis of the word *aboie* in the phrase *chien aboie* with the aim to distinguish the seme nuclear – *a loud cry* (N_{s1}). He has shown that correlation of the nuclear seme with different class semes gives two different sememes (S_{m1} and S_{m2}).

(1) a class of human contains the seme *human* (C_{s1})
l'homme crie
Diogène crie

(2) a class of animals contains the seme *animal* (C_{s2})
chien aboie
chacal aboie

Thus, the sememes based on two different class semes are the following:

$S_{m1} = N_{s1} + C_{s1}$ $S_{m2} = N_{s1} + C_{s2}$

In this sense, a classeme may be viewed as a linking semantic element of a phrase. We should notice that extended semes, regarded by Murzin, have much in common with classemes, being realized within adjacent components of a sentence, i. e. *mn.* In the primary (literary) functions, the adjacent sentence components are semantically agreed. It means that an extended seme of one component is correlated with the other. Consider: *children* (m) *are sleeping* (n). Here the two components are agreed according to the principle of *animate*. If one of the components is used in the secondary (figurative) function, it loses its extended seme. Consider: *the house* (m) *is sleeping* (n). Here the agreement between the components has been lost, since the meaning of the word *house* is associated with non-living beings. However, the seme of *living* in the second element, being extended, gives this characteristic quality to the first element of the sentence *house,* and by this transfers it into the neighboring class of the sign system. We notice that the meaning of *living* has been attached to the element of an "alien" sign system. In this sense, the contradiction between the primary and secondary functions of elements of a sentence provides interclass integration, and extended semes are regarded as means of this integration.

Murzin suggests that extended semes obtain universal character and the principles of the sentence building are common to all languages. Due to the extended semes one of the members of the sentence is clarified and supplemented by the other member. In this sense, a sentence of any language represents an incorporated structure, since it is built by means of inclusion of one element into the other. Thus, *incorporation* may be regarded as a universal principle of sentence building.

The concept of extended semes has brought Murzin to the suggestion that metaphor is realized not within the word, but within a syntactical structure. He suggests that metaphor is the result of incorporation of sentences. Since syntactical processes, as parts of speech activity, are hidden from the direct observation, there must be a mechanism for its exteriorization. This last constitutes what Murzin calls *contamination* (interplay). Let us take up the following metaphorical utterance:

'There were many people in the room. However, *his voice has floated to me*'

We believe that we understand metaphoric sense when we perceive new information, linked with a new quality about *the voice*. This new information reflects the whole picture of the situation, born in our mind as a result of crossing two different planes – real and imaginable. Crossing of two situations may be modeled by means of two sentences: 1) *the voice was heard* (S_{int}) and 2) *(X) has floated* (S_{bas}). The meaning of the introductory sentence (S_{int}) is aimed at a real fact. It helps to identify the subject of description (*voice*). The role of the basic sentence (S_{bas}) is to describe the very situation (*to be floating*), or to characterize it. Accordingly, the function of the introductive sentence is to form the subject of metaphor, and the function of the basic sentence – to form the predicate of metaphor. We see that within the analyzed metaphorical utterance *the voice* is characterized by a new quality. This quality is expressed in S_{int} implicitly. However, its meaning might be associated with that of the basic sentence and may occupy a vacant position within its structure. The result of this interplay will be the resulting sentence: (X↔*voice*) *has floated to me*.

In this way, it is possible to discover a parallel between the extended semes as means of integration of two adjacent elements and the links of two sentences, producing metaphor.

3 Metaphor models

A variety of different perspectives of metaphor research causes a problem of discussing metaphor on various theoretical foundations. For many years metaphor had been researched primarily as a semantic phenomenon (cf. Morgan 1980, Ricoeur 1986). In contrast to traditional semantic approaches to metaphor (cf. Morgan 1980, Cooper 1986, Ricoeur 1986) derivation takes as basic the premise that metaphor is a more complicated process than it is described in traditional theories, since the nature of metaphor is directly dependent on human thinking.

Before turning to the derivation theory in a more detailed way, we would touch upon the question about the place of this theory on the historical vector of metaphor models (with respect to their origins and principles of formation). We shall consider only those models that contribute to the progress of metaphor evolution. The main principles of metaphor models, as we suggest, are the following: 1) the increasing of the complexity of metaphor structure, 2) correlation of linguistic and beyond-linguistic spheres.

Consider now the first type of metaphor models.

3.1 The Linear model of metaphor (Aristotle, Quintilian)

Aristotle claims that metaphor constitutes a displacement, or an extension of the meaning of words, its explanation is grounded in the theory of substitution (cf. Wood 2015). The most important thing about this type of models is that the compared objects, as metaphor referents, are commensurable, in other words, refer to the same class (abstract or concrete objects). Figure 2 shows that metaphor is viewed by the analogy suggesting that 2 is to 1 as 4 to 3.

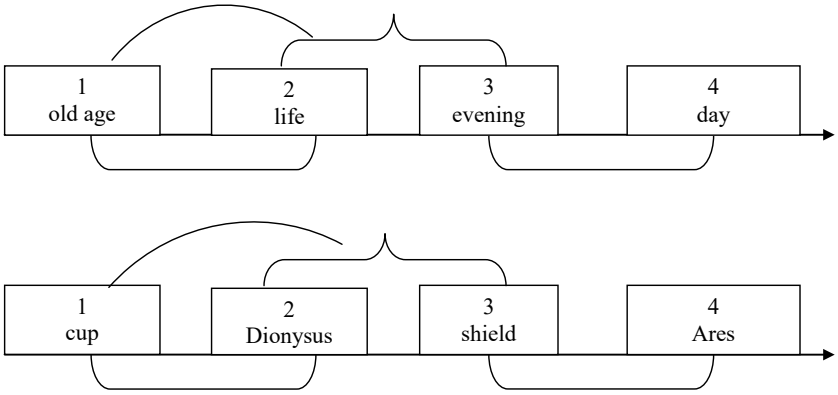

Figure 2: The Linear model of metaphor

Consider: *Old age* is to *life* as *evening* is to *day*. In this way, Aristotle calls the *evening* the day's *old age*. And *old age* will be comprehended as the *evening of life*. Consider: a *cup* to *Dionysus* is what a *shield* is for *Ares*. *The cup* is viewed by Aristotle with the help of the analogy with *Dionysus's shield*. And *the shield* – by means of the analogy with *Ares's cup* (cf. Aristotle 1932: 1457b 20–24).

The main principles of linear models are the following:

- linear unfolding;
- analogy of commensurate concepts (abstract or concrete);
- the terms of movement (from point A to point B);
- semantic criteria;
- word as metaphor carrier.

3.2 The Triangle model of metaphor (Searle 1980)

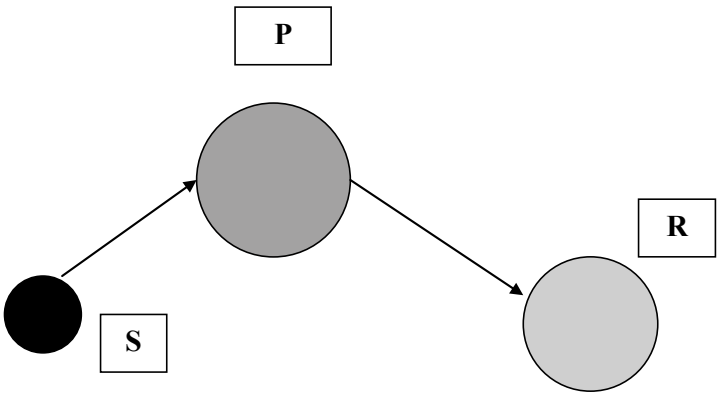

Figure 3: The Triangle model of metaphor

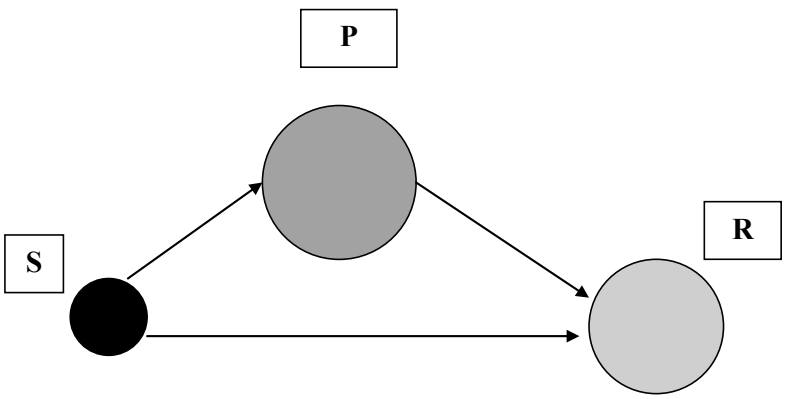

Figure 4: The Triangle model of dead metaphor

John R. Searle (1980) distinguishes between three elements of this model. The triangle model presents the general form of the metaphorical utterance: a speaker utters a sentence "*S* is *P*" ("Sally is a block of ice") (Searle 1980: 113) and means metaphorically that *S* is *R* ("Sally is an extremely unemotional and unresponsive person"), where S stands for a subject, P – for a predicate and R – for the truth (real) conditions determined by that meaning. As we can see from this scheme, the main task of metaphor here is to try to get a characterization of the relations between the three sets: *S, P and R* and to demonstrate how it is possible to commu-

nicate that meaning from *speaker* to *hearer*. According to Searle, a theory of metaphor must explain how it is possible to utter "*S* is *P*" and both mean and communicate that "*S* is *R*" (Searle 1980: 122–123). The hearer requires something more than his knowledge of the language, his awareness of the conditions of the utterance, background assumptions that he shares with the speaker. A *speaker meaning* does not coincide with *a sentence or word meaning*.

The main principles of triangle models are the following:

- triangle structure;
- differentiation between *sentence meaning* and *speaker's meaning*;
- similarity has to do with the production and understanding of metaphor, not with its meaning;
- interaction view of metaphor is inadequate;
- metaphors are of double nature: *restricted* (one thing not obligatory reminds us of something we will provide a basis for metaphor) and *systematic* (must be communicable).

3.3 The Grid model (Ricoeur 1986)

Paul Ricoeur is known as the founder of the tension theory of metaphor. This theory applies to the production of metaphor within the sentence taken as a whole.

Schematization is a kind of insight into the mixture of "like" and "unlike" proper to similarity. According to Ricoeur, this instantaneous grasping of the new congruence is "felt" as well as "seen". By saying that it is felt, we may underscore the fact that we are included in the process as knowing subjects. If the process can be called predicative assimilation, it is true that we are assimilated, that is, made similar, to what is seen as similar. This self-assimilation is a part of the commitment proper to the "illocutionary" force of the metaphor as speech act. It would seem possible to suggest that 'we feel like what we see something as', since it is the relationship that holds sense and image together. This suggestion may be understood on the Aristotelian foundation of 'seeing the similar', which has provoked a famous Ricoeur's 'seeing as' principle. Ricoeur defined it as "the intuitive relationship that hold sense and image together", since the mass of images is beyond all voluntary control, and there is no rule how to be learned for 'having images' (Ricoeur 1986: 213).

The power of metaphor would be to break an old categorization, in order to establish new logical frontiers on the ruins of their forerunners (cf. Ricoeur 1986: 197). He believes that metaphor, as a figure of speech, presents in an *open* fashion, by means of a conflict between *identity* and *difference*, the process that, in a *covert* manner, generates semantic grids by fusion of differences into identity (cf. Ricoeur 1986: 198). Thus, the identity and the difference do not melt together, but confront each other.

Consider the scheme of the Grid model.

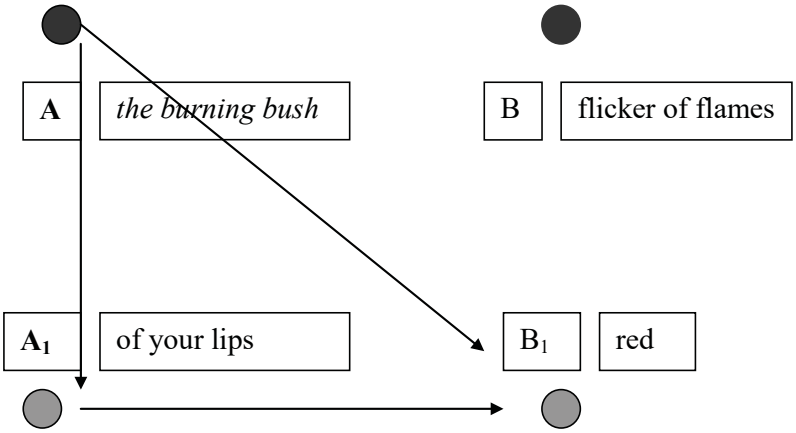

Figure 5: The Grid model of metaphor

According to Ricoeur, the metaphorizing term is always placed in position A. In this scheme the correlation $B \leftrightarrow B_1$ is regarded as the old categorization, relating to a known field of reference. The correlation $ASymbolA_1$ demonstrates establishing new logical frontiers, "relating to a referential field for which there is no direct characterization" (Ricoeur 1986: 299). The terms $ASymbolB_1$ (A is based on B_1) are called the nominal metaphor (Ricoeur 1986: 206). The Grid model corresponds to the meaning that assimilation between two pairs $BSymbolB_1$ and $ASymbolA_1$ is developed by means of unusual attribution. The main tenet of the grid type view of metaphor is that the predicative value that A_1 acquires from A is not that of identification, but that of subordination. The relation between A_1 and B_1 is represented by the identity.

This grid is built as a result of a split reference, or split structure. The imagination contributes to it, owing to its own split structure. On the one hand, imagination entails the suspension, of the direct reference of thought to the objects of our ordinary discourse. On the other hand, imagination provides models for reading reality in a new way. This split structure is the structure of imagination as fiction.

The main principles of the grid metaphor models are the following:

- metaphor is formed on the border between semantics and psychology;
- it is constructed by means of the split reference;
- a new predicative congruence is born;
- metaphor is viewed as a category mistake;
- 'seeing as' principle.

3.4 The Net (derivational) model of metaphor (Murzin 1974)

The main characteristics of the Net model is that, in contrast with the previous models, the derivational basis for metaphor is the text, not the word or the phrase, i. e., the process of metaphorization is actualized by means of the laws of text-formation. The net model tells us that two sentences are related by means of several operators. This model is intended to be a structured piece of derivational mechanisms representation. It models certain relations between sentences at two levels: surface level and deep level.

One more important thing is that metaphor is regarded as a semantically derived text unit. In this sense, metaphor model is represented as a complex (net) of sentences (in the scheme the symbol S stands for various kinds of sentences). The main principle of metaphor is suggesting new knowledge by means of the already known.

Metaphor formation takes place on two levels, surface and deep (Figure 6). It includes three steps: 1) the formation of a predicative structure (S_{pr}) and its further interiorization; 2) the interior process of contamination of two structures (S_{int} + S_{bas}); 3) exteriorization of the result of contamination (see Figure 6).

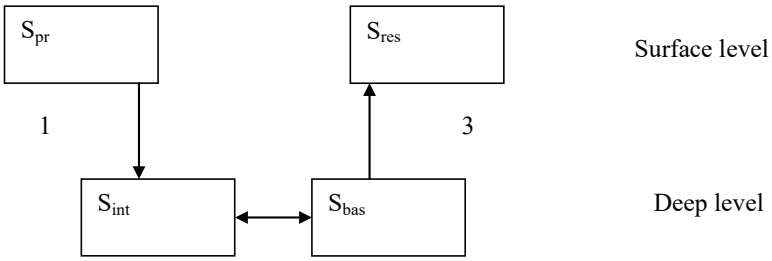

Figure 6: The Net model of metaphor

The view of metaphor as interaction and tension (exchange of ideas) belongs to Ivor A. Richards (1964). However, he does not view metaphor as a mechanism or as a textual phenomenon.

To have a clear view how metaphor is formed, consider the following:

> Although the station area was cordoned off and officially closed to civilians, *passengers* for the local trains had managed, in some unaccountable way, to *'filter through'*. They had already crammed the coaches and they crowded in the doorways or strolled or stood in front of them. (B. Pasternak "Doctor Zhivago", Vintage, London. 2002, 231)

The metaphorical phrase is *passengers filter through.* The meaning of the verb *to filter* is associated with a certain liquid flowing though porous substance removing impurities on it. Taking into consideration the semantics of the word *filter* and our experience of the situation the following sentence may be formed: *Passengers go through closed territories.* It is clear that this sentence represents the whole situation in a general way. It may be regarded as a starting point in understanding metaphor. For this reason, the sentence is called *the introductive sentence* (S_{int}). We see that the meaning of the introductive sentence is linked with the real fact, described metaphorically. The meaning of the sentence is correlated with its function, that is, with identification of the subject of description. Coming close to metaphor understanding, we think about possible images, provoking by metaphor. This process may be actualized in the sentence *X filters through,* which is called in our analysis *the basic sentence* (S_{bas}), since it fulfils the function of predication of metaphorical expression. Contamination of two sentences (introductive and basic), when the subject of description *passengers* occupies a vacant position in the basic sentence, produces a metaphoric expression:

1) ***Passengers*** *go through closed territories*
   ↓
2) ***X*** *filters through*
3) Passengers *filter through* (resulting sentence)

We have found out that in medical texts Net metaphor models are more complicated, since they are two-phased. In this kind of model the first phase deals with derivation of a simile. The second phase represents compression of a simile, resulting in the formation of a metaphor. The peculiarity of the second phase is that the resulting sentence of the first phase (S_{res1}) fulfils the function of a predicative sentence of the second phase (S_{pr2}), containing a simile.

Consider: "In the plain radiography, these erosions are recognizable AS more or less DENCE, irregular PATCHERS … (The 1st phase) In the active phase of the colitis, ulcerous defects appear, which create a PATCHY APPEARANCE of the mucosa (The 2nd phase)" (Mishlanova 2002: 122–23). The corresponding model of this process may be represented in the following way (Figure 7).

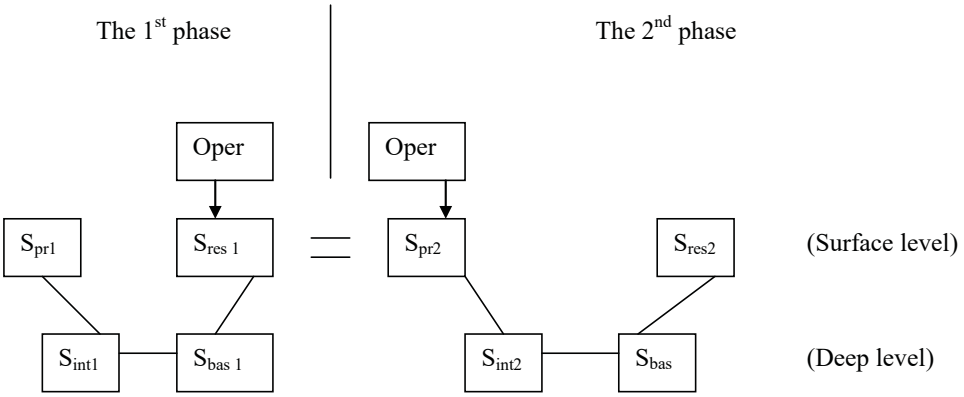

Figure 7: The Two-phased Net model of metaphor

Thus, the main principles of the net metaphor model are the following:

- this type of models is of a derivational nature;
- it presents metaphor as a complex two-level process;
- metaphor formation is correlated with text formation.

3.5 The Super Net model
(e. g. Alekseeva 1998, Mishlanova 2002, Alekseeva/Isaeva/Mishlanova 2014)

It is important to note that, the notion of metaphor within this model covers various spheres: metaphor mechanism, thinking process, a separate phase of a derivation process (cf. Figure 7) and the result of metaphorization that guarantee unification of various phenomena having different theoretical foundations. Thus, granted that it is quite appropriate to use the term *metaphor* to refer to a wide range of phenomena, and to accept that it constitutes a complete whole. Taking this into consideration, we argue that metaphor, sharing universal properties, is set off from its narrow definitions, i. e. as a rhetorical "decoration", or a certain discourse level. For the present derivational research, the following definition of metaphor will suffice: metaphor is a chain of various manifestations of the functioning of the cognitive mechanism, regarded as a process of the language unit development at various levels of discourse, or various stages of mental-speech activities.

The main principles of the Super Net metaphor model are the following:

- metaphor is regarded as a complex and integrative 'beyond linguistic' entity;
- it is associated with the process of the language unit development within discourse;
- the notion of *discourse* allows to overcome the opposition of *conceptual* vs. *language* metaphor, since it refers to the whole continuum of sign activities;
- the integrative discourse definition as a verbally mediated activity in a special sphere makes it possible to view metaphor as a universal sign development process, covering the whole continuum of sign activities.

As for the discourse, it can be argued that within it the process of conceptual system building takes place, or the system of derived knowledge about the reality, which is necessary to solve problems during mental activities. In this sense, it is legitimate to suggest that the cognitive mechanism of discourse is realized as a process of getting a derived knowledge which is grounded in cognition about the world. It is by this mechanism that man can go beyond the boundaries of the sphere of signs, i. e. may complete the construction of the reality. It is an obvious fact that this quality of the human mind provides an enrichment of the system of knowledge and, as a result, a modification of the world including the development of sign systems. We draw attention to the role of the processes of conceptualization and categorization which realize the processing of new information with the help of an individual conceptual system and by means of the usage of inferential knowledge. And we have implied that the mechanism of discourse plays a great role in the processes of signs development regarded as external manifestation of the internal process of *inference.* We would point out that the usage of a sign as a functional support provides a quick and adequate inference of knowledge. And it is arguable that this sign obtains the already known, or assimilated, projection equal to a steady cognitive strategy of inner mental programming (cf. Mishlanova 2002).

Returning to metaphor models, we would say that diachronically viewed, metaphor dating centuries ago has greatly changed. As we have seen, the observed five metaphor models are distinguished as linear (3.1–3.3) and non-linear (3.4 and 3.5). Linear models are associated with the formula '$R_1 \rightarrow$ metaphor operator $\rightarrow R_2$', where R is a metaphor referent. Metaphor operators in these models may be various – interaction (R_1 *influences* R_2), substitution (R_1 *instead of* R_2), simile (R_1 *resembles* R_2) and association (R_1 *seeing as* R_2). We qualify the first three models as linear, since they are associated with directions from one point to the other, and with the question 'What does R_2 depend on?' or 'Are there any limitations for R_2?'. In summing up the peculiarities of the above models, we may notice that the two metaphor referents are different and yet mutually interdependent. Contrary to linear models, non-linear models are linked primarily with the beyond-linguistic sphere, i. e. cannot be studied as descriptive linguistic objects.

Approaching metaphor from this perspective has far-reaching consequences. In our research we aim at demonstrating how the distinction between linear and non-linear metaphor models may be evaluated within a wider framework of the Metaphor Knowledge Development Paradigm. It is natural that each new paradigm gives a new scope of what metaphor is. From new perspectives metaphor is critically evaluated and enriched.

Comparable with the suggested differentiation between linear and non-linear metaphor models is the distinction between classical, modern and post-modern adequacy. This statement impels us to elaborate somewhat on the critical distinctions between these types of scientific paradigm. The classical paradigm observes the following principles: universalism, logic

and experience. Within the light of these principles, metaphor was viewed as the result of interaction of the two pictures of the world: rational and ideal. Metaphor was regarded to be a certain analogy of the reality, which could be the result of observation and experience (see the Linear model, 3.1). According to modernism, metaphor was characterized as an individual author's creation, constructed by means of impressionist principles. Embracing these principles, metaphor was studied as a semantic phenomenon, i. e. as a complex of constantly renewed forms of image representations (see the Triangle and the Grid model, 3.2 and 3.3). In stark contrast to the modernist perspective, the post-modernist position holds that metaphor is a product of cognition and communication. From this point of view, metaphor is basically studied as a matter of intertexuality, or interlinks of ideas. Since metaphor, from a post-modernist perspective, is somehow a pluralistic or a co-constructive creation, it is less orientated to a certain domain than a modernist metaphor. The reason why we have introduced the link between metaphor models and scientific paradigms is that we wish to make clear that it is not enough to study metaphor only with the level of semantic similarity. We present our views of the two perspectives and its relations to the derivational principles in Table 1.

Table 1: Modernistic, Post-modernistic and Derivational principles of metaphor characteristics

Modernistic principles of metaphor characteristics	**Post-modernistic principles of metaphor characteristics**	**Derivational principles of metaphor characteristics**
individualism, the author himself creates an image	pluralism, co-construction	application of basic concepts as a result of co-thinking
linearity	non-linearity	non-linearity
semantic centrism	decentrism	complexity and integrity
interest in man's inner world	links with every day esthetics	interiorization exteriorization
searching for a new form of image representation	intertextuality mixing the ideas	searching for a new form of image representation
knowledge transfer	knowledge communication	knowledge transfer
impressionism	cognitivism	cognitivism

In terms of methodology, we have summarized metaphor models under the three main paradigms – classical, modernistic and post-modernistic. In our view, correlation of metaphor models and types of scientific paradigms may be presented in the following way (the sign [↦] means "viewed within the frames of"): linear metaphor model (3.1) ↦ classical paradigm; linear metaphor models (3.2 and 3.3) and non-linear (derivational) metaphor model (3.4) ↦ modernistic paradigm; non-linear (super-net) metaphor model (3.5) ↦ post-modernistic paradigm.

We see that within the above correlation metaphor models can be viewed on different ontological and theoretical preferences.

With a reference to Alvin Toffler, it is possible to characterize the society of the 21st century as a "third wave" taking into consideration computer technologies, internet and mass communication (Toffler 1980: 18). Being a kind of an antipode of modernism, a new society obtains new qualities, such as destruction, decentrism, cognitivism and co-construction. Toffler regards these society qualities as signs of a new civilization, free from unification and

stagnation (cf. Toffler 1980: 72). From the above quotation it is quite obvious that post-modernistic perspective opens new horizons for metaphor research.

As for derivation as a methodological perspective, we suggest that derivational principles of metaphor research lie quite on the border between modernism and post-modernism, thus obtaining common features, typical to both paradigms. According to the derivational perspective, the process of metaphor is unseen, unnoticeable, since it is referred to the mental sphere, and consequently should be studied by means of modeling. On the surface of language we see only the results of metaphorization. Following this, derivatologists study metaphor as a complex system of interconnections within the phenomenological space.

Our aim in modeling metaphor was to discuss how it may be understood conceptually and how it may be applied within a framework of cognitive research and modern scientific paradigm. For this reason we use a two-step approach. First, we observe several basic metaphor models (linear and non-linear). Secondly, we interpret these models based on a theoretical suggestion.

We come to the conclusion, that as a discursive phenomenon, metaphor is defined as a cognitive mechanism of representation of knowledge at all the levels of thinking (from naive to professional, and to scientific knowledge), based on mapping from a conceptual source domain to a conceptual target domain (cf. Lakoff/Johnson 1980: 97–105). Metaphor is actualized in discourse and represents stages of the development of a linguistic sign (cf. Alekseeva/Novodranova 2006, Mishlanova 2002). Metaphor implies a number of strategies of verbalization and popularization of scientific knowledge. The production of special knowledge relies on the background knowledge of an addressee and provides the mapping of this knowledge into the conceptual sphere of interpreting discourse, thereby contributing to categorization of a new knowledge.

4 Derivational view of metaphor

Within derivatology metaphor is regarded as a secondary function of word-forms of a sentence. Regularity of a sentence may be of two kinds: *formal* (grammatical) and *material* (semantic). If all the material word-forms realize their differential semantic features within a sentence, it is called a *regular* material sentence. Metaphor is formed by means of combining, or crossing, of two *regular* material sentences. Murzin called this process *derivation*. Crossing is realized by means of two mechanisms: *substitution* and *equation*. Consider the two regular sentences:

(1) $S_0 = nm$

(2) $S_1 = n_1m_1$

The result of crossing of these regular (coordinated) sentences will be a materially *irregular* sentence:

$S_0 = nm$	$n_1 \leftrightarrow n$ ($\leftrightarrow$ is substitution)
$S_1 = n_1m_1$	$m_1 = m$ (= is equation)

Irregular (non-coordinated) sentence:

$S_{res} = n_1m$

Members of regular sentences are semantically coordinated by a certain principle. In sentence S_0 *A man (n) looked (m) over the fence* the words *man* and *looked* are coordinated by the principle of "activity". In sentence S_1 *Apples* (n_1) *are seen* (m_1) *over the fence* the words *apples* and *are seen* are coordinated by the opposite principle. During the process of words crossing the principle, being extended, is preserved and prescribed to the other semantic class.

Consider:

S_0 = *A man (n) looked (m) over the fence* *Apples* (n_1) ↔ *man (n)*

S_1 = *Apples* (n_1) *are seen* (m_1) *Are seen = look over*

S_r = *Apples* (n_1) *look (m) over the fence*

We see that the substituting word obtains a new principle ("inactivity"). Taking this into consideration, it is possible to assume that the resulting sentence is a metaphor carrier and the process of combining (crossing) sentences is the foundation of metaphor.

As we have noted, the peculiarity of derivational view of metaphor is that metaphor is studied not in isolation, but within a broad frame of text, discourse, cognition and knowledge communication. Within the text, metaphor is researched on the basis of text-formation process, controlling by means of the integrity of two mechanisms: *nomination* and *predication*. Nomination is associated with the already given meaning, which lies in the basement of a further process: *predication*. In this sense, a new metaphorical meaning is a natural result of *predication*. It follows that the process of predication may be regarded as prescribing a certain quality to an object, already nominated in the text. We suggest that nomination and predication are controlled by means of two mechanisms: *contamination*, providing text refolding, and *compression*, aiming at text folding. Murzin gave an extremely careful consideration by reconstructing the mechanism of metaphor on the basis of the operations that govern the process of metaphorization (Murzin 1974).

From this perspective, metaphorization is bound by the integrity of these two mechanisms. *Contamination* clears up the logic of a new metaphorical meaning formation by means of combining old and new information about the described object or person. It is realized with the help of transposition of the already known knowledge into a new vacant place. *Contamination* is the main process of derivation. It consists of several steps, or cycles. Each step is a concluded and an independent part of this process. That is why it may be regarded as a derivational cycle.

Compression provides metaphorical meaning and makes it relatively independent from the initial literal meaning.

The basic tenets for metaphor research within the derivation theory are the following:

- metaphor should be viewed on two levels: surface and deep (cf. Murzin 1984);
- mechanism of metaphor is analogous to that of the syntactical way of derivation of compound sentences (cf. Murzin 1974);
- metaphor model may be viewed as propositional, since the proposition is the main content of the utterance (cf. Alekseeva 1998, Mishlanova 2002);
- metaphor is derived as a result of contamination of two sentences: basic and introductive (cf. Murzin 1984);

- metaphor is predicative by its nature (cf. Murzin 1984, Mishlanova 2002);
- metaphorization is connected with human activity (cf. Murzin 1984, Alekseeva 1998, Mishlanova 1998).

Taking these tenets as points of departure, the following discussion aims at showing their role within a framework of metaphor mechanism.

5 Metaphor mechanism from the point of view of derivatology

Thus, the mechanisms that carry out metaphorization, are *contamination* and *compression*. The next idea is connected with semantics derivation. Murzin (1984) considered metaphor as a type of semantics derivation. In his view, the basis of metaphor is formed by means of contamination of two sentences. Consider: 1) *Clouds are moving in the sky* and 2) *Children are chasing each other.* The contamination of these two sentences is possible by means of the conjunction *as if.* In this case we get a compound sentence: *Clouds are moving in the sky, as if children were chasing each other.* A further modification of this sentence into the form of a simple sentence, Murzin assumes, is the mechanism of metaphor. It contains two stages. The first stage is connected with superposition of syntactically equal components: (*Clouds – Children*) as *if* (*are moving – are chasing*) *each other in the sky.* The second stage is connected with elimination of redundant elements. Out of two predicates the richest, from the semantic point of view, is left: *are chasing* takes the place of *are moving,* since the semantic structure of the first predicate includes the meaning of the second one. The choice of a subject is dependent on text semantics. As far as it is about *the clouds*, the noun *children* is eliminated. As a result, we have got the sentence: *Clouds are chasing each other in the sky* (cf. Alekseeva et al. 2014).

The results achieved by derivation theory of metaphor were encouraging: metaphor mechanism was revealed and described. It was found out that it was analogous to that of text-formation.

6 Conclusions

Derivatology is founded on a suggestion that derivation is tightly connected with the *production* of language units. It is one of the achievements of derivatology to have intensified the study of metaphor mechanism. Even within the frames of modern conceptions, we seem to be unable to suggest a relevant mechanism of metaphor. Studying metaphor within derivational perspective offers some solutions of metaphor problems which have not received explanations in the majority of other theories. From derivational perspective *metaphorization* may be regarded as the universal mechanism of decoding of a language sign into a secondary language sign in the process of text-formation. We suggest that *metaphorization* is a system forming factor, which fulfils the homeostatic language function. This function preserves language system in its functional status, in other words, it provides its text-forming activity.

The 20th century has seen a significant development of the theoretical framework for understanding what metaphor is and how it works and, consequently, how it could be modeled. In our research we study various metaphor models. The rhetoric theories of metaphor view the production of metaphor within the sentence (cf. Richards 1964, Searle 1980, Ricoeur 1986, Steen 2009). Derivation theory has reconstructed the act of metaphor on the basis of the text. The main suggestion is that text, which contains metaphor as its part, may be regarded as a process with fixed traces of metaphorization. The sources for metaphor modeling are these

fixed results of metaphorization. We aim at proving that in the foundation of metaphorization there are universal derivation processes, including incorporation, contamination, etc.

In our research we attempted to explore the nature of metaphor on the theoretical foundation of derivation theory, developed at Perm linguistic school. On the one hand, derivation theory provides a reliable proof of metaphor mechanisms. On the other hand, it enriches metaphor theory with a new alternative. It has been observed that metaphorization is the analogous process to that of text formation. In particular, the mechanism of metaphorization appears to be associated with contamination and compression.

We argue that metaphor requires substantial interdisciplinary cooperation and a much wider scope. We believe that viewing metaphor as a linear sequence is not sufficient to reveal its complex nature. Based on derivatology theory, we suggest that metaphor mechanism is more than correlation between domains. Due to the textual character of metaphor, it is possible to consider it as a cognitive model that provokes various types of knowledge – naïve, practical, professional and scientific.

We suggest that all the issues of metaphor can be solved within the frames of derivatology. The aim of traditional researches of metaphor was based on the desire that it would reveal the transference of meanings, or its mediation. However, derivatology provides quite a new knowledge in our understanding of metaphor. We observed the main metaphor mechanisms, responsible for ontological properties of metaphor such as cognition, communication and modeling. These properties can be explicated by the human intension of metaphor usage.

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Culture-derived Concepts in Scientific Discourse: Transferring Knowledge through Metaphor

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Abstract The paper focuses on metaphors with a culture specific source domain in the scientific discourse like *Rosetta stone* and *Trojan horse*, their functions and peculiarities traced from a novel metaphor to a term. Pertaining to general cultural knowledge these expressions continue to keep much of their original conceptual content and are used in special discourse metaphorically. These metaphors are predominantly used in the title of the work and then elaborated further in the ongoing process of text creation. No matter these metaphors seem to be rather specific, the conceptual analysis we are applying reveals that these complexes are particularly useful for transmitting new kinds of knowledge due to their dynamic conceptual content, heuristic potential and pragmatically aimed sphere of experience.

Our analysis has shown that although the content of these units is rather broad, one conceptual feature is usually brought to the limelight expressing the author's central idea, which becomes the most salient feature in a particular stretch of professional discourse. This conceptual dominant evokes mental representations of the cultural content acting like a key to the piece of specialized discourse through categorization and conceptualization, thus determining the transformed metaphorical meaning of phrases becoming terminological units in the framework of a particular terminological system.

Keywords Culture specific concepts, scientific discourse, ESP, academic discourse, conceptual dominant

1 Introduction

A very special type of language used in scientific communication has long been most justly defined as first and foremost informative, representing and transmitting knowledge. Indeed, there can be no doubt whatsoever that the Language for Specific Purposes (LSP) is a "concrete, well-defined register" (Akhmanova 1978: 88) or "a formalized and codified variety of language, used for special purposes with the function of communicating information of a specialist nature at any level in the most economic, precise and unambiguous terms possible" (Picht/ Draskau 1985: 3). This discourse "represents the structures of knowledge formed at a certain period" (Novodranova 2007: 139) by the scientific community and what is more important – this "particular type of rhetorical structure" (Wood 2001: 74) provides a means for knowledge advancement in a particular discipline "acceptable to peers in his scientific community" (Wood 2001: 76). A special text such as a scientific article or a monograph serves therefore as

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> a means for keeping and transmitting scientific knowledge in the verbal form from the point of view of concrete discipline and the author's knowledge, so it needs to exemplify a set of main categories, concepts and notions of this science, it has to show that it is aimed at revealing the existing types of relations and links between these notions (Manerko 2016b: 142).

"As any other form of verbal communication, academic writing shuns any definite, normative generalizations" (Duszak 1994: 191) and therefore should be studied with regard to the balance between general and well-accepted features and some novel tendencies always emerging in discourse. So, apart from the standardized and neutral norm of the language of science, special discourse nowadays also exhibits the other tendency. Special discourse should be explicated on the basis of quite a number of peculiarities influenced by socio-cultural mechanisms represented by language means in the speech of language personality, individual choices in style and creative patterns of knowledge-making that apparently go beyond the traditional vision of scientific lingua franca as a standardized language. This new tendency could be roughly defined as popularization or individualization. Individualization of modern scientific discourse includes functions of popularization that are aimed at presenting useful information for the reader or listener, widen the horizon of the receiver and satisfy the recipient's curiosity (cf. Engberg 2017). The growth of the knowledge volume in academic discourse has to reflect novel tendencies of creating new conceptions and revealing new notions in definite fields of human activity that make the language personality use vivid language means suiting not only the nominative process, but also the existing system of terminological relations. Not only the content of the scientific paper itself accounts for its potential validity, but also the way this content is presented. Thus, it has been demonstrated "that the hard disciplines tend to have highly evaluative language that results in strong highlights" (Yang 2016: 89), a rise of evaluative language (e. g. *unprecedented, unique, novel*) in biomedical abstracts in the last few decades (cf. Vinkers/Tijdink/Otte 2015). These tendencies underlying the linguistics change are perfectly consistent with the growing interest not only in conceptual metaphor, but in a novel one with a heuristic potential fitting into the preestablished field. Here we aim to address the development of novel and creative metaphors in academic discourse focusing on biological and medical writings.

The vital role of conceptual metaphor in science is largely undisputed nowadays (cf. Alexeeva 1998, Johnson 2010, Herrmann 2013) for it offers insight on how new scientific ideas emerge, how they are transformed with advances in a knowledge field and how they are thus explained and disseminated through papers and monographs. What is more, the emergence of new creative metaphors seems not to contradict the information-driven or knowledge-based view, but to work within the already established rhetorical paradigm.

Metaphor in contemporary scholarly writing appears to be essential not only in explaining and thus fulfilling the generally assumed function of academic discourse as transmitting information, but also in demonstrating the emotional content or evoking the emotional response in the readers aligning the domains. Since "the essence of metaphor is understanding and experiencing one kind of thing in terms of another" (Lakoff/Johnson 1980: 5), it amounts to a tool for clarifying, elucidating and simplifying the complicated abstract concepts of science. In other words, metaphors in science are tools for categorizing human experience and scientific evidence. Within this framework a metaphor is not only "a fundamental scheme by which people conceptualize the world and their own activities" (Gibbs 2008: 3), but also a vehicle

for transferring new knowledge in an emotional and engaging manner as "there are no emotion-specific metaphors" (Kövecses 2008: 380).

The major objective of this paper is to reveal how a metaphor with a cultural historical basis as a source domain works in scientific discourse as it is a more complicated case of transmitting knowledge through metaphor. Recent works in cognitive linguistics argue the significant role of broad cultural knowledge being stored and structured in various culturally specific concepts (cf. Komova 2005, 2013, Kövecses 2010). Quite unpredictably and seemingly contradictory to the type of the text aimed at informing the potential reader about the new knowledge in the studied area is the emergence of creative metaphors based on cultural and historic concepts. Therefore, the concepts like *Rosetta stone* and *Trojan horse,* pertaining to the general cultural knowledge still retain much of their original conceptual content used intentionally metaphorically in academic discourse. They are proved to be useful in transmitting some novel ideas in the particular field of knowledge.

The potential of these metaphors is investigated through the notion of a culture specific concept that allows revealing the broad cognitive content, which is ready to outline the central element in categorization as well the elements at the periphery of the entity serving the source domain.

2 Knowledge transfer and metaphor in ESP discourse

The most natural preconception to be applied to the form and content of an ESP text and its rhetoric is the rule of finite energy of the reader of scientific literature. Suffice it to say, the volume of scientific literature is growing at an astonishing pace: 7000 scientific journal articles were published every day according to Naisbett (1982) and since then the number should have doubled if not tripled with 2000 publishers and 17500 research/higher education institutions taking part in scientific process (cf. Lillis/Curry 2010). Therefore, the energy and attention of the reader, pushed into an environment with astounding information load, would be spared on two things simultaneously: the form of the linguistic expression and the complicated scientific content – the phenomena and ideas being presented, explained and discussed. Providing a highly complicated scientific content the form should be as concise and crystal clear as possible. The thought should depart from a well-grounded abode and come to a no less grounded destination point without any loops or derisions and leaving a reader with an unclouded picture in his head. However, the assumption of a fully standardized discourse should not be taken for granted, and the representation of LSP domain as primarily driven by information pure and simple is not uncontroversial. With the growing marketization of higher education (cf. Furedi 2010) and increasingly competitive environment as well as pressure for visibility of publications, the question of how to promote publications becomes "a major concern for institutions of higher education, researchers and journal publishers" (Yang 2016: 90). The language of science turns out to develop and to be susceptible to modifications, it starts assimilating some features of other genres and types of discourse, and this process becomes manifested in high-impact journals first going down to lower-impact ones. Therefore, the role of metaphor in the contemporary scientific discourse is twofold: cognitive and marketing or advertising.

As far as the first function is concerned, Hofstadter/Sander offer an explanation on the importance of *analogy* being the core of cognition and thus central for scientific thinking: "[…] without concepts there can be no thought, and without analogies there can be no concepts" (Hofstadter/Sander 2013: 3). The information stored in a specialized text is not only processed

and decoded as any linguistic utterance in the linear manner, but also categorized into a number of classes and organized into various types of models[1]. Building the argumentation on the notion of a mental model, Miller develops this idea even further: "Models are metaphors which function like analogies and that non-propositional modes of thought are essential in scientific creativity" (Miller 2000: 163).

The fundamental design feature of the human verbal behavior is that the two main systems interrelate in discourse processing: the linguistic system and the conceptual system. Two corresponding levels are usually outlined for metaphor identification procedure. Evans pinpoints that the conceptual structure "relates to the non-linguistic knowledge representations that words tap into and can draw upon in situated language use" (Evans 2009: 4). He also emphasizes that the first one interacts with the latter "in order to facilitate access to conceptual knowledge" and its representation (Evans 2009: 25). The conceptual side of a metaphor may be of various complexity: Kövecses (2017) singles our four levels of schematicity starting with the level of image schemas, the level of domains, the level of frames, and ending with the most schematized one – the level of mental spaces.

Van Dijk (1999) postulated two criteria the conceptual models should meet: effectiveness (of searching, processing and representing the necessary information) and come-at-able for updating. A metaphor in this respect fulfills these criteria and turns out to be a viable tool for transmitting knowledge of varying complexity and abstractness, as Black noticed: "every metaphor is the tip of a submerged model" (Black 1993: 30), echoing the notion of the conceptual model introduced by van Dijk.

Nowadays, metaphors in science are used in theory-building, theory-explaining and 'theory-labeling or naming' and considerable attention is paid to conceptual metaphors in science (cf. Gibbs 2008).

> Scientific metaphors are central to the construction of models and to the constitution of new scientific theories and that specially when they are at the beginning of their formulation, theories should resort to metaphors in order to provide understanding and to allow to extract inferences by using knowledge available from other domains. (Rodriguez 2011: 84)

Still, regardless of the conceptual metaphor's universality and omnipresence, many metaphors are culture specific and these culture specific metaphors seem to contradict the prerequisites of language used for scientific communication. Therefore, we arrive at a paradox connected with the notion of finite energy of the reader we introduced before: metaphors facilitate cognitive processing and shorten the time of reading, while once requiring novel alignment between the domains they prolong it. The paradox is solved taking into account the type of metaphor: conventional metaphors are processed faster, whereas the novel metaphors asking for new alignment account for a longer time and effort on the side of the reader. This effort itself should serve as a semiotic marker signaling that this information in the passage is important and should be remembered. The attention of the reader may be kept through exploiting other conceptual structures grounded in culture. Yet, within the paradigm of promoting research and raising the impact factors of the journals, the original metaphors based on cultural and historical concepts appear exceptionally useful and particularly interesting.

[1] Since 1985 van Dijk has claimed that construing models in memory, connected with the contextual representation of a situation is important for discourse studies as "models are typically richer in information than the discourses that express them" (van Dijk 1999: 126).

The source domains for metaphors in science are many, but when we deal with more complex ideas serving the basis for the source domain associated with cultural-historical knowledge, the fully-fledged conceptual analysis becomes essential. This analysis is based on the concept description. The concept is traditionally defined as "an element of thinking" (Picht 1997: 336), as "an operational meaningful unit of memory, mental lexicon, conceptual system, brain language, and the whole picture of the world reflected in the human mind" (Koubriakova 1996: 90).

The metaphor identifying procedure traditionally works on two main levels: the linguistic and the conceptual one, where source and target domains are distinguished. It has long been acknowledged that a distinction occurs between at least three major processes going hand in hand: the identification procedure, which is a merely linguistic process based on language expressions and human interpretation, understanding metaphors that deals with conceptual structures and cross-domain mappings extinguishing the source and target domains, and finally the most influential one – the understanding of the stretch of discourse: its communicative and pragmatic value.

The culturally-derived word groups are very interesting material for the research, because they store a highly complex and at the same time holistically uniformed cognitive content, being a trigger for new words and prolonged utterances – stretches of discourse. The concepts representing such expressions are used as metaphors with source and target domains. Concepts used as a source domain for cross-domain mapping verbalized by the iconized set of words represent a category complex in itself. It is featured by a set of notable peculiarities in actual use and being deliberate "intentionally constructed mapping across two semantic and conceptual domains" (Steen 2013: 11). Moreover, the general conceptual content is wider for culture-derived concepts compared to those of ordinary language.

3 Beyond metaphor and genre in special discourse

In this part of the article we would like to illustrate these theoretical assumptions on examples taken from scientific and popular scientific writing on the basis of the nominal expressions *Rosetta stone* and *Trojan horse* and concepts representing them. Both are associated with a social and historical background going back in ages and accounting for different weight of conceptual elements within their structure thus bringing together semantics and pragmatics (cf. Geeraerts 2006: 75) in modern academic discourse.

3.1 The Rosetta stone: from the concept appearance to its structure in academic discourse

The cultural-historical content of the expression *Rosetta stone* is connected with the Napoleonic wars. This content is represented by the encyclopedic meaning of the nominal phrase – Rosetta stone.

The famous Rosetta stone was discovered in mid-July 1799 in the village of Rosetta by a group of archeologists brought by Napoleon to Egypt. This stone was covered by inscriptions in three sign systems: at the top there were early Egyptian hieroglyphs, then Demotic writing, also of unknown Egyptian origin, and at the very bottom – Greek letters, that could be read. For centuries scientists had made attempts to understand the mysterious code of the ancient Egypt as the lost civilization, but in vain, and only the discovery of the texts written in three languages and the correspondence between them made it possible for scientists to translate

hieroglyphics for the first time in 1822. Two main scholars rivaled to understand the code – Thomas Young from the UK and Jean François Champollion from France. Nowadays the stone is a valuable possession of the British Museum. It is a very important cultural artifact of British culture as well as the European one. Rosetta stone once deciphered became a turning point for studies of the ancient Egyptian times and its written remains were made to tell their faraway history. The mystery at the very origin of something once unraveled was able to explain all other mysteries or problems became the conceptual dominant of the *Rosetta stone* in modern culture and it is the basis of the metaphoric transfer in scientific discourse.

The frequency of occurrence provided by Google Ngram viewer exhibits the frequency peaks of this expression use in the English language in the 19th century (cf. Figure 1). However, there is a steady rise at the end of the 20th century indicating a revival of interest to the topic.

Figure 1: The use of the expression Rosetta stone starting from 1800

There is a possible misconception to be discarded here. "Frequency of occurrence is not the only factor determining prototypicality, but next to conceptual coherence, it is certainly an important one" (Geeraerts 2006: 75). And it goes without saying that context-based study reveals many other nuances of the metaphor in use. The first peaks correspond to non-metaphoric use, while steady growing after 70s of the 20th century is likely to point at metaphoric use. The latter is proved by corpus data to be extremely fruitful from that period up to now (cf. Figure 2).

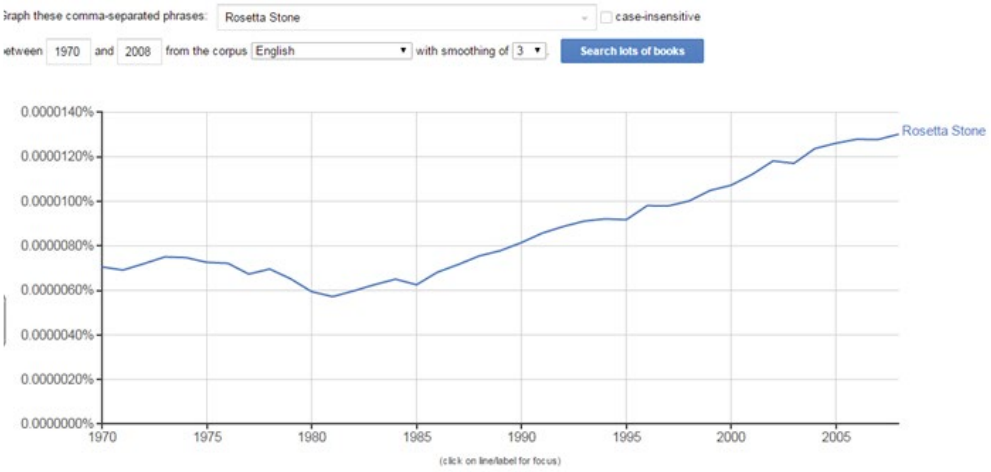


Figure 2: Google Ngram viewer data for the frequency of Rosetta stone in the second half of the 20th century

Since we are mostly interested in scientific discourse, and Google Ngram Viewer provides only general tendencies in language use, we looked up for *Rosetta stone* in PubMed database. PubMed is a search engine as well as a database accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics. Apart from bull titles and abstracts allowing to be searched, it contains links to the full texts on the journal sites. 170 examples from which 144 cases of metaphoric use were studied starting from the end of the 70s. Based on the number of tokens we see in Figure 3 that the interest in this metaphor has been steadily rising since the middle of the 20th century up to now and the general tendency outlined is supported.

Figure 3: The number of papers and books with at least one usage of the Rosetta stone concept in the second half of the 20th century

Let us turn to the first example taken from a well-known book: *The Double Helix*. It is an autobiographical account of the discovery of the double helix structure of DNA written by James D. Watson, one of the Nobel Prize winners for it. The book presents a very personal and detective-like picture of the world-known events combined with purely scientific explanations. The book as well as the authority of the author played a very significant role in Biology of the 20th century, therefore a metaphor of Rosetta stone being introduced in this type of writing spread to a purely scientific discourse as well. This is a prime example where the metaphor is supported by a number of words in the context facilitating the alignment between the domains. At the very beginning of the book the author writes:

> Given the fact that DNA was known to occur in the chromosomes of all cells, Avery's experiments strongly suggested that future experiments would show that all genes were composed of DNA. *If true, this meant to Francis that proteins would not be the* ***Rosetta stone*** *for* ***unraveling the true secret of life****. Instead, DNA would have to provide* ***the key to enable us*** *to find out how the genes determined*, among other characteristics, the color of our hair, our eyes, most likely our comparative intelligence, and maybe even our potential to amuse others. (Watson 2012: 2)[2]

The main idea of the passage is explained with the help of a reference to the Rosetta stone concept. This idea of searching for something explanatory in itself is addressed in the context of Watson's experiments. Moreover, the quest for the solution to the code of DNA and not proteins is similar to the search of Champollion: the one who unraveled the secret of the Rosetta stone with the help of Coptic language. Both researchers (Champollion and Francis) were trying to find out the origins of life, reveal the secret of human civilization. More than that, those things that were once discovered should explain everything remaining to be solved within the discipline. Within the concept that contains the stored information about that historical event there is one feature brought to the limelight in natural science discourse. The main idea is the *heuristic potential of something* to be intellectually mastered. This idea lies beneath the whole book; it makes the author's creative unsettled mind strive for an elegant explanation to the abundant accumulated data on the subject. The discovery of the double helix structure of the DNA and a clear correspondence between its nucleotides was the event of no less importance and its heuristic potential for further studies was unprecedented too.

In the context taken from a piece of autobiographical writing, the metaphor of *Rosetta stone* determines the stretch of discourse, forming it in terms of knowledge expressed and linguistic signs and chosen for further developing the idea. We observe such expressions to support the main idea: *unraveling the true secret, the key* to human beings' life and gene invention. They all belong to the semantic field of something mysterious, difficult to solve and ancient, of course.

Metaphors with a culturally specific concept as a source domain are not common for scientific writing as contrasted with conceptual metaphors facilitating the mode of reasoning like the metaphor of *genetic code, gene library* or *translation process* nowadays. The first one was introduced in Schrödinger's *What is life?* (1944) in the form of *code-script* and used further to understand protein synthesis. Arising in mid-50s of the 20th century it gave birth to a consistent metaphor set connected with codes and languages in Molecular Biology. After the Second World War with huge attention paid to codes and their deciphering this idea was introduced

[2] Here and further in the examples the emphasis is ours.

into the discourse of many areas (cf. Knudsen 2005). Yet, it was most influential in Biology as it underwent a discursive shift:

> Through the introduction of terms such as information, feedback, messages, codes, alphabet, words, instructions, texts, and programs, molecular biologists came to view organisms and molecules as information storage and retrieval systems. Heredity came to be conceptualized as contemporary systems of communication, guidance, and control. This linguistic repertoire was absent from molecular biology before the 1950s. (Kay 1997: 25)

James Watson was impressed by this book and marks reading it in the preface to his *Double Helix*. In the light of this socio-cultural context the metaphor of the *Rosetta stone* seems only natural to appear and get disseminated.

Since culture specific metaphors carry quite an extensive load of cultural and historical information that may or may not be actualized in discourse, they are present only in a fraction of papers and monographs not allowing for distributing between the disciplines, yet we mostly focused on sciences and not humanities.

A very interesting case with the whole concept being actualized is found in the foreword for a book titled "The Rosetta stone of the Human Mind: *Three Languages to Integrate Neurobiology and Psychology (Art, Science and Music)* most clearly explaining the choice of this metaphor in a long introductory passage:

> Whether it takes the form of diagrams, graphs, models, images, illustrations or labels, metaphor always plays a function in the revelation of the self. This practice finds its most happy example in the choice of ***the Rosetta stone*** *itself as the metaphor* for the way *different languages cohabit* the same investigative space of *the quest for understanding who or what we are*.
> Yet, even this usage leads to even more questions. The history of the reception of the Rosetta stone required that *the three languages be read for what they had in common*. They were ***clues*** to each other, allowing *obscure* ***symbols*** to *reveal their* ***unknown significance***. Yet, anyone who has experienced the liminal space where one language meets another is aware of the untranslatable dimension that divides one *symbolic order* from another. *The three languages* on the Rosetta stone cannot be reduced to a single meaning, because this *meaning* will be at the cost of the minute but inescapable differences in tone, emphasis and timber that separate individual languages. (Sanguineti 2006: xiv)

The most important thing in this passage is the idea of metaphor, which reveals the unknown significance in three semiotic systems – art, science, and music together. The author stresses the idea that obscure symbols allow revealing their relevant importance in deciphering ***clues*** *to each other* and *symbolic* ***order***, while the unity of three symbolic arts is underlined by the phrases *different languages cohabit, the quest for understanding,* and at last their meaning can be reached *at the cost of the minute but inescapable differences* displayed by peculiarities of separate languages.

Another example is even closer to hard sciences when the analogy between the massive data sets of the sequenced genomes and their evolution, and the Rosetta stone and the deciphering by Champollion is fully drawn. The linguistic representation of human languages is put forward, when the aim of the author is to provide some *insights about the language of proteins*.

> Proteins, the main cell machinery which play a major role in nearly every cellular process, have always been a central focus in biology. We live in the post-genomic era, and inferring information from massive data sets is a steadily growing universal challenge. The increasing availability of fully sequenced genomes *can be regarded as* the ***'Rosetta stone' of the protein universe***, allowing the understanding of genomes and their evolution, just as the original Rosetta stone allowed Champollion *to decipher* the ancient Egyptian hieroglyphics. In this review, we consider aspects of the protein domain architectures repertoire that are closely related to those *of human languages* and aim to provide some *insights about the language of proteins.* (Scaiewicz/Levitt 2015: 50)

The general conceptual field of the metaphor fits into the linguistic sphere that has become rather common for the sphere of biology: first as a fresh suitable analogy and then as a linguistically grounded methodological tool coinciding with the time nucleic acids were "recognized as strings of nucleotide bases comprising the famous four-letter alphabet" (Searls 1997: 333). Numerous examples of metaphorical expressions becoming terms include: *library of genomes, reading the code, DNA-RNA-proteins translation process, gene editing, etc.* These appeared in the 50s of the 20th century and determined the development of Molecular Biology ever since. Interestingly, since many linguistic expressions got conventionalized the metaphor turned out to be in constant quest for novel ways and novel expressions. This is especially vivid in peripheral genres of lay abstracts, popular scientific reports and interviews with scientists. Here we find that *bacteriophages can listen in to bacteria, DNA is a blueprint of life,* and *we need a translation service for genes.* These do not allow the underlying metaphor to be ultimately fossilized in academic discourse.

Metaphors with the culturally specific concept as a source domain are not that frequent in scientific writing as contrasted with conceptual metaphors facilitating the way of thinking, such as *nature as a code or life as a memory/information system* (cf. Emmeche/Hoffmeyer 1991). Nevertheless, they most naturally incorporate into this global mode of reasoning. These metaphors carry quite an extensive load of cultural and historical information that are actualized in discourse.

In the majority of examples extracted from a number of scientific journals, a single reference to *Rosetta stone* is enough and we rarely find such a detailed explanation. In these cases only a fragment of conceptual knowledge is evoked and made use for creating a metaphor.

The analysis of the corpus data shows that although this conceptual content is quite broad, it is structured according to the zones of core and periphery. These areas lend themselves to identification. Their use in shortened and prolonged linguistic units inside the stretches of discourse are typologically characterized by bringing to the limelight a very special feature, which turns out to fit together everything: the whole concept, the linguistic content and the expression in the stretch of discourse.

One of the conceptual features is usually brought to the limelight in a particular stretch of special discourse. To the core we can ascribe the *linguistic sphere* with the codes, meaning, symbols, languages profiled (in Table 1 the core is represented by number one). The mid-zone comprises the necessity to solve the *mystery* itself or crack of the code itself or the *historical reference*. To the periphery – creating the common conceptual space for at least three notions necessary to solve the problem since Rosetta's unique character was determined by the correspondence between three major parts constituting it: three types of alphabets. The conceptual dominant central for the use of this metaphor in scientific discourse is – the heuristic potential of the idea of a 'key'.

Now let us give more examples of the major conceptual zones actualized by this metaphor in academic and popular scientific discourse. The zones of the concept as well as the conceptual dominant evoke mental representations of the cultural content acting like a key to a major vehicle for the metaphor to be worked on to the piece of academic discourse. This dominant determines the meaning of the set of phrases in the text. The linguistic units with a metaphorical load are presented in italics (cf. Table 1).

Table 1: The layers of the concept structure of the Rosetta stone *starting from the conceptual dominant of the category*[3]

1) The linguistic sphere (codes and languages deciphering and their sequence)	The Rosetta stone of Human Mind: three *Languages* to Integrate Neurobiology and Psychology *(Art, Science and Music)* (Sanguineti 2006); **Digital Rosetta stone**: A Conceptual Model for Maintaining Long-Term Access to *Digital Documents* (Heminger/Robertson 1998); A ceRNA hypothesis: **the Rosetta stone** of a hidden *RNA language* (Cell 2011); We found 6809 pairs of nonhomologous sequences, both members of the pair having significant similarity to a single protein in some other genome that **we term a Rosetta stone sequence** because *it deciphers the interaction* between the protein pairs (Science 1999).
2) Universal heuristic potential within a certain system ('like a key')	The Lawyer's **Rosetta stone**: How Frank Shepard's Invention Transformed Legal Research and Remains "Indispensable" Today (LexisNexis 2001); Arabidopsis, **the Rosetta stone** of flowering time? (Science 2002) (*Arabidopsis is a model object for abundant plant research); The long QT interval syndrome. A Rosetta stone for sympathetic related ventricular tachyarrhythmias (Circulation 1991); Evaluation of diastolic filling of left ventricle in health and disease: Doppler echocardiography is the clinician's **Rosetta stone** (Journal of the American College of Cardiology 1997).
3) A common conceptual space for three notions/ objects (unifying)	**The Rosetta stone** of Human Mind: three Languages to *Integrate (Art, Science and Music)* (Sanguineti 2006).
4) The necessity to get solved itself (a mystery, a quest for new knowledge, revelation)	The Earth as a distant planet: **A Rosetta stone** for *the search of* Earth-like words (Vázquez/Pallé/Rodríguez 2010); Metabolic profiling: **a Rosetta stone** for genomics? (Current opinion in plant biology 1999).
5) Historical reference	The Rosetta stone, *key to the original deciphering of Egyptian hieroglyphs*, has probably been the most famous language inscription on the planet. This massive piece of polished black stone, discovered in 1799, contains parallel messages in old Greek, hieroglyphs, and demotic, a cursive form of hieroglyphics, chiseled into its surface. Twenty-four years after its discovery linguists finally completed the *decoding* which permitted the people of the *world to understand* the writings and culture of ancient Egypt (Yong 2006); *Unlocking the mysteries* of diastolic function: deciphering **the Rosetta stone** 10 years later (Journal of the American College of Cardiology 2007).

[3] Here we include the titles of the books and extracts from the journals. For the books and monographs we provide the author and the date of publication, yet for the journals we put the year of publication and the journal name as we focus of the large trends rather than the individuality of particular authors. The necessary details are given in the references.

The uneven distribution between the use of this metaphor in various types of the text – namely the title of a book or a scientific paper and the text itself, usually starting with the introductory part, also account for the deliberateness of this kind of metaphor. We found that this expression is used in the title (98 cases), abstract (82), introduction (60), body (24), conclusion (49). Yet the sole uses turned out quite rare: only 25 times it was used only in the title, while for the abstract 18, and only once in the introduction. It is usually repeated in two or three parts of the paper mostly being title + abstract, or abstract + introduction or title + abstract + introduction (Figure 4).

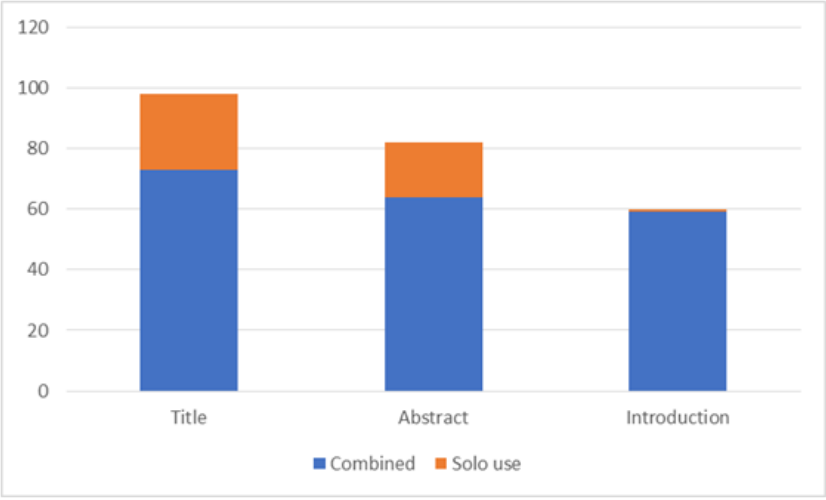


Figure 4: The distribution of the Rosetta stone metaphor in the parts of a scientific paper

The deliberate type of metaphor is generally considered less frequent in academic discourse than the conceptual metaphor. Another argument for the deliberateness of it and the attractiveness is the range of journals it is found in. Rosetta stone in its evolution has generally proceeded from higher impact journals to the lower ones – the process accompanied with the growing frequency (Figure 5).

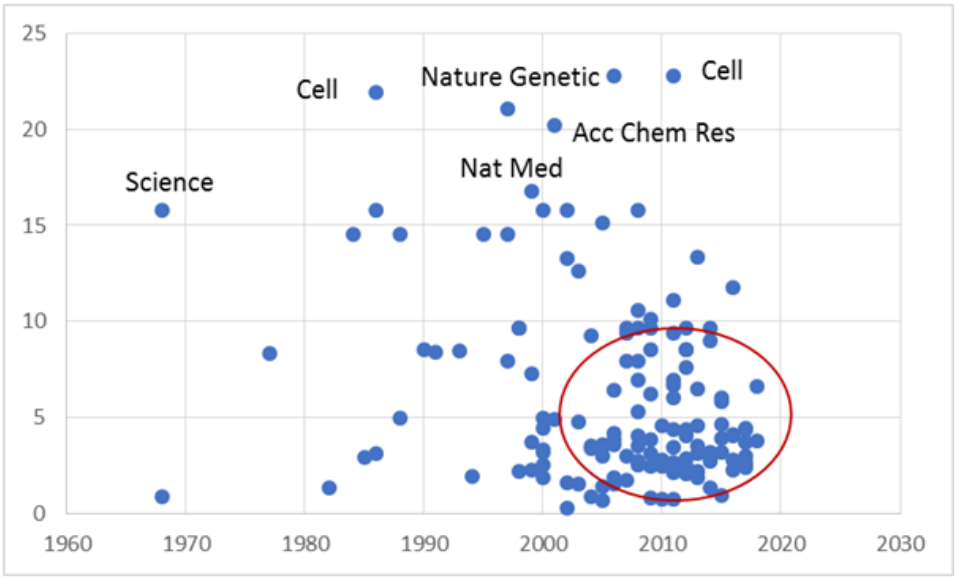


Figure 5: The impact factors of the journals using the metaphor Rosetta stone

It is specially used to attract attention thus brought to the initial position supported by an explanation further evoking all the parts of the conceptual content, useful for not only understanding a metaphor in general, but making it transfer knowledge from one area to another. The latter becomes especially important for interdisciplinary models being worked out in the last few decades.

3.2 The conceptual metaphor of the Rosetta stone *in the interdisciplinary perspective*

The analysis of the contexts proved that the metaphor based on culturally specific concept is used deliberately and most consciously. The authors recognize that Rosetta stone may be interpreted in a number of ways, thus provide an explanation of what they mean by this metaphor in the context of their special topic:

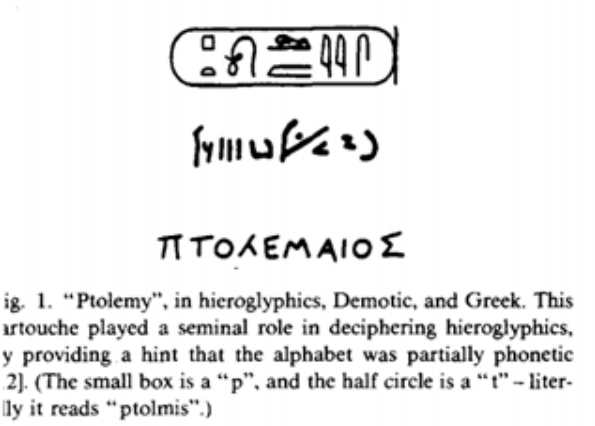
> A decade ago we described the role of echocardiography in the "Evaluation of Diastolic Filling of Left Ventricle in Health and Disease: Doppler Echocardiography Is the Clinician's **Rosetta stone**". (Lester et al. 2008: 679)

The *Rosetta stone* here being used as a metaphor to refer to anything that is a critical key to a process of decryption or translation of a difficult problem.

> Will the model developed for *Arabidopsis unlock* the complexities of flowering time control in all plants, as the **Rosetta stone** did for Egyptian hieroglyphics? (Simpson 2002: 285)

What is more notable, a multimodal dimension including the figures may be evoked to serve an explanation, thus giving the metaphor an opportunity to go beyond the semiotic medium into the sphere of the conceptual stage of the meaning construal, which precedes the verbal realization. Besides that, the ancient Egyptian writing system combining logographic, syllabic

and alphabetical characters contained 'the sacred letters' or 'god's words' (the first line) (see the material on hieroglyphs: https://en.wikipedia.org/wiki/Egyptian_hieroglyphs), the later Demotic scripts derived from the Egyptian writing (the second line) and at last the Greek phonographic reading of the same cartouche correspond to the "general semiotic system of meaning" (Manerko 2016a: 722). The *integration* of the metafunctional principle provides the basis for semiotic resources and a mechanism of its creation in discourse, where three writing systems on the Rosetta Stone serve the source domain explaining the necessity to be united together to bring forth the idea of 'connectionism' in the target domain, at which it is aimed at (cf. Figure 6).



ig. 1. "Ptolemy", in hieroglyphics, Demotic, and Greek. This artouche played a seminal role in deciphering hieroglyphics, y providing a hint that the alphabet was partially phonetic 2]. (The small box is a "p", and the half circle is a "t" – liter-ly it reads "ptolmis".)

Figure 6: An illustration provided for a paper "A Rosetta stone for connectionism" (Farmer 1990) explaining the title and the major idea

The next image (cf. Figure 7) is supported by an extended explanation abound in manifesting the heuristic potential for further studies and treatment through the metafunctional principle of *analogy* between the known languages (Ancient Greek and Demotic) and mysterious hieroglyphic inscriptions on the Rosetta stone and their decoding, on the one hand, and the similar processes going on in isogenic (normal) cells and other ones that need deciphering. They were called *cellular Rosetta stones.* The *Rosetta stone* metaphor brings forth not only the basic semiotic and cultural information, but the mechanism of treatment represented in the attributive component of the substantive construction, revealing the biological sphere of activity. The mechanism is based on the explanation and understanding of currently unknown biological phenomena.

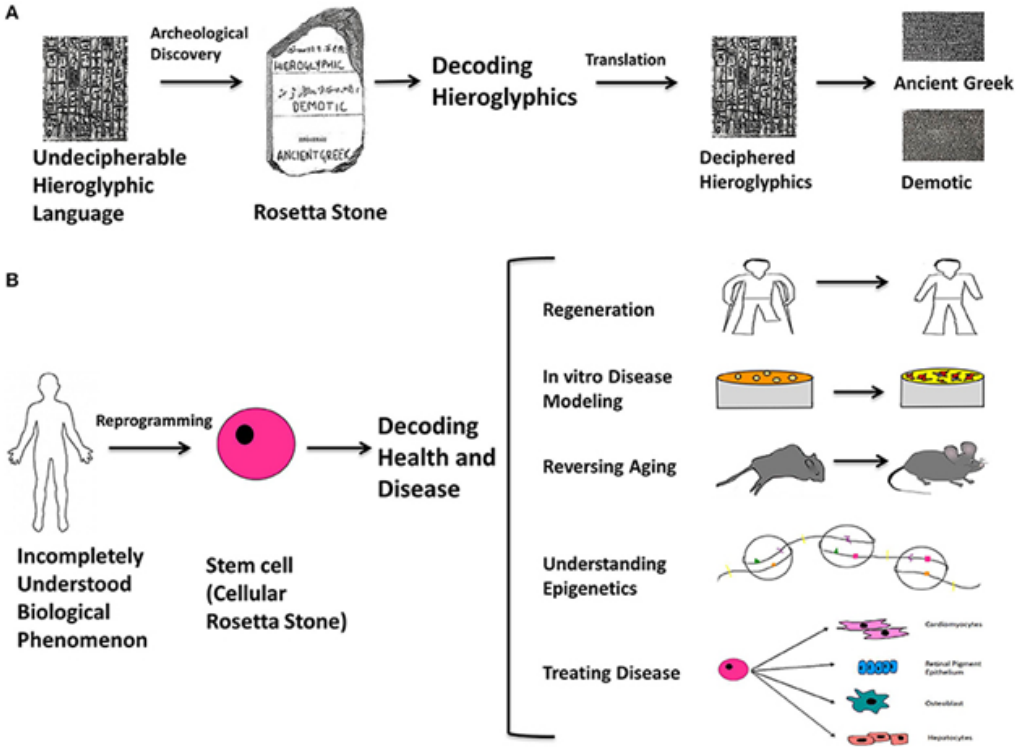


Figure 7: An illustration provided for a paper "Cellular Reprogramming for Understanding and Treating Human Disease" (Kanherkar et al. 2014)

"*The Rosetta stone* analogy" is explained consecutively in the following way:

> ***The Rosetta stone*** is an archaeological slab with the same text in three different languages; Hieroglyphics, Demotic, and Ancient Greek, and its discovery proved to be *a turning point* in understanding the Hieroglyphic language. By direct comparison of the three languages, it was possible to *decipher previously unintelligible* Hieroglyphics from the other two known languages. *An analogy can be made* with respect to stem cells: they can be thought of as "cellular Rosetta stones" because they are *key to understanding* the multifaceted mysteries underlying human health and disease. Stem cells can be *conceptualized* as *"cellular Rosetta stones"* because they are enabling us to create and compare cells with diseases or cellular phenomena that are *poorly understood (non-deciphered Hieroglyphics),* with isogenic cells that are completely normal (well-understood, Ancient Greek or Demotic). This is the contribution of stem cells toward *modeling* and treating diseases and *generating* functional cell types. In addition, they are becoming *quintessential* for studying epigenetics, aging, cancer and regeneration. It won't be long before they emerge as the ultimate practical tool and make their mark on the conceptualization of biological science in terms of understanding molecular and cellular events and treating debilitating diseases. By using reprogramming as the means *to make cellular Rosetta stones,* it will be possible to form a *universal understanding of currently unknown biological phenomena* and develop an accurate philosophy for cellular processes, disease and therapy. (A) Illustrates the

> rationale behind the way the Rosetta stone was used to decode hieroglyphics. (B) Illustrates the analogously unexplained biological phenomena to which stem cells can be made with various characteristics on an isogenic background and used to understand them; for example (1) limb-regeneration (2) disease modeling at the cellular level (3) treating organismal aging (4) understanding epigenetic mechanisms underlying diseases (5) generating lineage specific cell types to treat degenerative and chronic diseases, or acute injuries. (Kanherkar et al. 2014: 2)

Drawing a preliminary conclusion, it should be noted, that culturally important concepts are charged with an unprecedented potential for adaptation and change in the course of evolution within the semiotic systems – language and culture. The content of the concept may fluctuate depending on the genre of special kind of discourse: a book, a monograph, a popular scientific text, a review paper, an experimental paper with narrowing down the conceptual content from the first to the latter. It may also depend on the discourse field. Finally, all the characteristics of the concept may vanish leaving only the conceptual dominant meaning. Moreover, outlining the conceptual dominant within the concept structure helps to explicate the development of metaphor and semantics in late 19th and 20th centuries.

Particularly, this conceptual dominant becomes a common meaning for numerous contexts. Once it is well-established and unambiguously perceived it might be combined with other abstract concepts or idioms. Here are some examples of the kind:

> *Animal Models in Translational Research: Rosetta stone or Stumbling Block?* (Bioessays 2017) actually suggesting that the unit under scrutiny is approaching the dead metaphor stage and is very close to an idiom – *stumbling block*;
>
> *Pollen Tube Growth and Guidance: Occam's Razor Sharpened on a Molecular Arabinogalactan Glycoprotein Rosetta stone* (New Phytologist 2018) bringing two concepts with a long history together;
>
> *A Sword in the Rosetta stone* (Journal of Biosciences 2005) that is naturally an allusion to the famous *The Sword in the Stone* – T.H.J. White novel and the animated story of King Arthur of 1963;
>
> *Tamoxifen: the Rosetta stone or Hope Diamond?* (Jordan 2003: 338) where an attempt to create the stone-based opposition was made. The Hope Diamond was rumored to carry a curse thus not carrying the promise to solve the scientific mysteries (the heuristic potential), but to exacerbate them. The conceptual dominant is extracted and even played upon.

The name of Rosetta had come a long way from a small unknown village in Egypt to a personal name of the stone and then to a culturally specific concept, "an unrolled text with a very deep conceptual content" (Garagulja 2009: 20) and then to a metaphor in various kinds of texts and finally back to a personal name – *Rosetta* (comet chaser). The photographs taken by Rosetta in the open space aimed at unraveling the secrets of a mysterious 'mini' ice world – a comet. The NASA site also explains this choice, referring to the original story:

> Just as the **Rosetta stone** provided *the key to an ancient civilisation*, so ESA's Rosetta spacecraft *will unlock* the *mysteries* of the *oldest* building blocks of our Solar System – the comets. As the worthy successor of Champollion and Young, Rosetta will allow scientists

> *to look back* 4600 million years to an epoch when no planets existed and only a vast swarm of asteroids and comets surrounded the Sun.
> (http://www.esa.int/Our_Activities/Space_Science/Rosetta/Why_Rosetta)

The culturally-derived concept used for the domain appeared to be rather consistent to the conceptual metaphor existing in contemporary biology – the linguistic view of the processes (cf. Searls 1997) becoming more and more popular and reflected in a number of linguistic units (cf. Emmeche/Hoffmeyer 1991). Due to the broad knowledge packed in this metaphor and its heuristic potential the concept was gradually accepted, neutralized and gave rise to a set of terms within the sphere of Biology: *Rosetta Stone protein, Rosetta Stone hypothesis, Rosetta Stone method* and *Rosetta stone sequences of the domain fusion.* Terms serve as designations of specific concepts of science and technology. The appearance of the term may be regarded as a terminal stage of metaphor evolution as they appear "as a result of knowledge accumulation and appearance of special notions and concepts" (Shelov 2003: 180–181). As the word combination is used both with and without inverted commas, it may still preserve its metaphorical meaning. By a term *Rosetta Stone* "a protein chain composed of two fused proteins" is meant.

> Crystal structure of the worm NitFhit **Rosetta stone protein** *reveals* a Nit tetramer binding *two* Fhit dimmers.
> **According to the Rosetta stone hypothesis,** if the separate Nit and Fhit genes could be shown to occur in the same subset of genomes (that is, to share a phylogenetic profile), then the existence of a fusion protein in invertebrates and the coordinated *expression* of separate mRNAs in mouse suggest that Nit and Fhit function in the same pathway and that the structure of invertebrate NitFhit may reflect the nature of Nit–Fhit interactions.
> Recently, a general method was proposed to identify *interacting proteins* by *identifying a* ***'Rosetta stone' protein*** *consisting of two unrelated proteins fused in one organism but expressed as separate polypeptides in other organisms*. With few exceptions, experimental evidence and bioinformatic inference suggest that the existence of a fusion protein in one genome *powerfully predicts* that the separate polypeptides function in the same cellular or biochemical pathway in other organisms 36 and 37. *The strongest case that* ***Rosetta stone proteins*** *decode real* interactions can be made when the separate genes have similar gene expression patterns and are found in the same subset of genomes (that is, share a phylogenetic profile). (Pace et al. 2000)

It seems that in coining out this term a parallel interaction of several notions as a conceptual feature and the conceptual dominant being a driving force for naming process were employed. A similar way was undergone by another culture specific concept – *a Trojan horse*, being of no lesser popularity to the scientific discourse and even giving two terms in distinct areas: biology and computer science (for a detailed discussion on the latter cf. Isaeva 2013).

3.3 A Trojan horse in the sphere of Biology

As far as Biology is concerned, the expression *A Trojan horse* started to act as a deliberate metaphor, as a tool for clarifying and communicating a complex novel idea or theory to scientific community. The general number of tokens according to PubMed is over 500, starting with editorials as early as 1958 and ending with dozens of papers already in 2018. As it follows from the context analysis, the evaluation of the concept changed leaving the negative connotations

aside and focusing on the intricate type of action. Possibly, the war metaphor needs not to be stressed as it is already pervasive in medical discourse and has the net of metaphorical expressions: *fight cancer, arms race between phages and bacteria, outflank the defense of bacteria, spy on quorum-censing mechanism*. However, the type of secret action gave the opportunity to use it in medical papers working on the novel drugs and their delivery systems.

> After ten years of fighting the Trojans, the Greeks played the most famous trick in *military history* – building a wooden horse. Once taken within the walls of Troy, Greek soldiers hidden inside the Trojan horse slipped out in the middle of the night and opened the city gates. The Greek army thus entered and destroyed the city. As this *strategy* worked for the Greeks, so it can work for *transporting* molecules across the blood-brain barrier (BBB). ***Molecular Trojan horses*** *are brain transport vectors that include endogenous peptides*, modified proteins and PEPTIDOMIMETIC monoclonal antibodies. These vectors *target* specific receptor/transport systems of the brain capillary ENDOTHELIUM and undergo receptor mediated TRANSCYTOSIS through the BBB. This technology has allowed the brain targeting of recombinant proteins for neuroprotection, antisense radiopharmaceuticals for *in vivo* imaging of brain gene expression, and non-viral gene. (Pardridge 2002: 131)

The author of the paper does not only give it a title with the iconic expression, but explicitly entwines it into an introduction allowing for a successful cross domain mapping between a piece of cultural information about Greek history and brain transport vectors. The negative connotation is completely absent in this case, and the ability to penetrate something extremely difficult to be gone through – here the blood-brain barrier – is profiled.

This profiling feature puts forth a conceptual dominant addressed in various contexts. The predominant number of examples come from high impact journals on most vibrantly developing fields of research. This metaphor is rather consistent with the general conceptual metaphoric discourse of war and struggle used in the field of Biology and Medicine (cf. Larson 2005, Periyakoil 2008). Since the *Trojan horse* metaphor belongs to a very common knowledge of historical character known to all educated men irrespective of their specialization, it is used in the title only, and rarely it is supported by other phrases from the paper itself. The most common linguistic units, supporting the metaphor are verbs with a meaning of crossing the border, penetrating or making war: *spread, transport, deliver, combat,* and *target*. Several examples with a *Trojan Horse* point at various spheres of biological sciences:

> *Brucella abortus* Traverses Brain Microvascular Endothelial Cells Using Infected Monocytes as **a Trojan horse** (Frontiers in Cellular and Infection Microbiology 2018);
>
> A **Trojan horse mechanism** for the *spread* of visna virus in monocytes (Virology 1985);
>
> Protein phosphatase 2A: **the Trojan horse** of cellular *signaling* (Cellular Signalling 2001);
>
> **The Trojan horse:** *survival tactics* of pathogenic mycobacteria in macrophages (Trends in Cell Biology 2005);
>
> *Delivery* of bioactive molecules into the cell: **the Trojan horse approach** (Molecular and Cellular Neuroscience 2004);
>
> Glutamine: **a Trojan horse** in ammonia neurotoxicity (Hepatology 2006);

Intracellular photodynamic therapy with photosensitizer-nanoparticle conjugates: cancer therapy using a **'Trojan horse'** (*Photochemical & …* 2006);

A cellular **Trojan horse** for *delivery* of therapeutic nanoparticles into tumors (Nano 2007);

Trojan horse strategy in Agrobacterium transformation: abusing MAPK *defense signaling* (Science 2007);

Autophagy, **the Trojan horse** to *combat* glioblastoma (Neurosurgical Focus 2006);

A Trojan horse for Human Immunodeficiency Virus (Chemistry & Biology 2015);

The Trojan horse of the Plant Kingdom (Cell Host & Microbe 2018).

The conceptual dominant still allows the general historical content to revive and get used in the contexts beyond the medical investigations. The latest article on cross-kingdom RNA interference led to the discovery of plant extracellular vesicles acting as "Trojan horses to deliver small RNAs into fungi to *fight* infection". The major idea of the paper is illustrated in Figure 8.

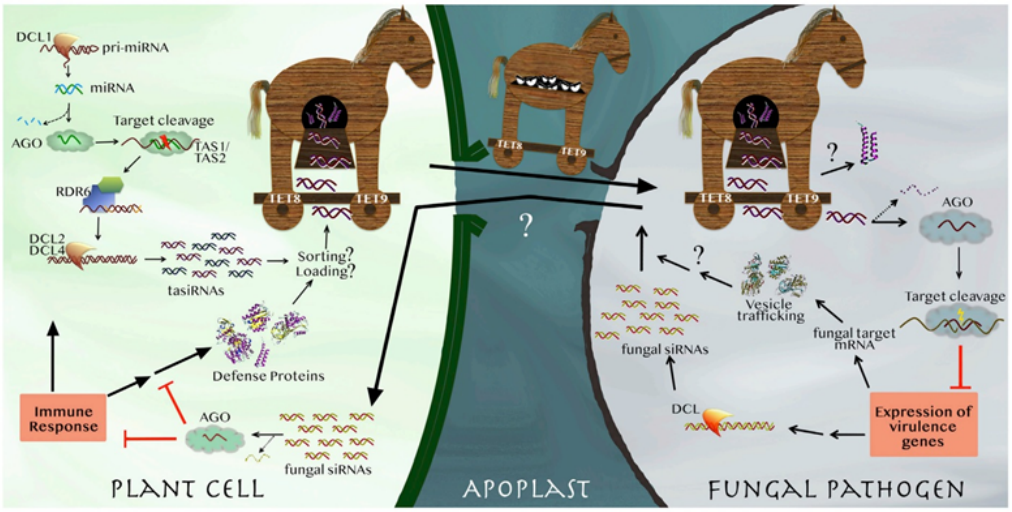


Figure 8: An illustration for "The Trojan horse of the Plant Kingdom" (2018)

4 Conclusion

Two major tendencies are outlined in the development of scientific discourse: standardization and individualization. If the first tendency corresponds to a centripetal force, the other one to a centrifugal one. As it happens in nature these two forces are ontologically unified and cannot be, by any means, traced apart. Indeed, the writers in sciences "rely heavily on conventional practices to encode ideas, to employ warrants and to construct arguments" (Hyland 2008: 3). What is more, the use of English in scientific communication is increasingly standardized and thus neutral keeping in mind the number of non-native speakers as well as collaborative works using English as their medium. However, despite the growing neutralization and standardization of scientific discourse provided by the universal character of English as a *lingua*

franca, another tendency could be revealed. High impact journals are gradually becoming more and more oriented towards a wide audience of specialists: they make the material published increasingly more attractive combining the use of metaphor along with other boosting techniques and useful tools to transfer new knowledge more efficiently. Publications in these journals might be compared to some kind of currency as they ensure further citations.

It has been recently revealed, that abstracts in higher impact journals are featured by a higher narrativity factor (Freeling et al. 2019). We can state that metaphors work for enhancing the narrativity of the paper as well and possibly much better than using simple linguistic techniques such as linking words. Deliberate metaphors basically open up another dimension of intertextual connections. Metaphors with the target domain situated in science are usually regarded to be a complicated mental entity, their source domain seems to be no less complicated that brings about the rise of metaphors based on culturally specific concepts. These concepts represented by nominal phrases, such as *Rosetta stone* and *Trojan horse* pertaining to general cultural knowledge still retain much of their original conceptual content that could be actualized and profiled in scientific discourse.

The conceptual analysis of the complicated metaphors in science with the source domains of the kind reveal the identified categorization represented by the core and periphery zones, which open up new possibilities for a more detailed investigation of the target domains. The feature getting profiled in academic discourse and relevant in the concept organization is a conceptual dominant. This dominant is a form of salience effect abundant in language that is ready to present the idea that plays as the focus in scholar's minds creating the new data bringing together semantics and pragmatics.

This dominant evokes mental representations of the cultural content acting like a key to a piece of special discourse and determining the meaning for the set of phrases in the text. The examples studied prove that the stored and conceptualized information of a very philological and semiotic character *(Rosetta stone)* and historical character *(Trojan horse)* by nature become especially relevant in other spheres of knowledge, construing patterns of discourse in academic writing. The complicated conceptual content becomes not a potential obstacle for understanding, but a viable conceptual tool for explaining something new. It is also necessary to mention, that scientific discourse provides the future generations not only with information structured and processed, classified and dried, but with a conglomerate of emotionally evaluated knowledge, structured according to other than but pure logical principles. The metaphorical language in light of contemporary scientific Pragmatics of being visible seems to be paradoxically more direct than literary language.

In case of the *Rosetta stone*, the search of meaning behind the signs and structures of language, collecting one puzzle from various parts is very similar to the work of any scientist, interpreting, uniting and seeking for analogies. The *Trojan horse* metaphor in Biology is recognized for its potential to get through various barriers that had long been struggled for. This paper has attempted to outline a distinct class of metaphors in scientific discourse and their functions that seem to be twofold: cognitive (inward aimed) and pragmatic (outward aimed). Both metaphors are united by a dynamic character semantics in discourse. Otherwise stated, this inexhaustible curiosity lying beneath the scientific quest and the dynamic heuristic potential made these concepts powerful metaphors so popular across the disciplines and genres. The rich conceptual and emotional content makes these metaphors meaningful, effectively potent of knowledge transfer. Arguing the vital importance of the notion of meaning, Ray Jackendoff compared it to the "Holy Grail" (Jackendoff 2002: 267) for the disciplines making up

the cognitive framework such as Linguistics, Philosophy, and Psychology, again using a highly culture specific metaphor.

Last but by no means least, the issues of scientific register and its uniformity arise. The representation of what is acceptable and what is beyond the limits of the generally acknowledged norm needs to be studied further and revisited for practical implications such as training in Academic Writing for non-native writes of ESP. A successful academic writer should, therefore, be able not only to identify a stretch of discourse as metaphorical but also to decipher and map the source domain to the target domain of his professional sphere of interest and thus interpret the stretch of discourse unambiguously: on-line comparison between two distinct domain-specific knowledge representations (cf. Gentner et al. 2001). A certain cultural and so-to say "metaphoric competence" in similar culture specific concepts becomes essential both in terms of passive and active knowledge and given the growing role of metaphor in science the cultural component in teaching ESP should not be dismissed as having no practical value or importance.

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Prognostic Potential of Political Metaphors

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Abstract The problem we dwell upon is the role of metaphors in political forecasting. Political forecasting is a powerful means of manipulating the audience. Any political forecast is aimed not only at representing the best-case scenario and the worst-case scenario of the political situation, but also at conveying the emotional content of the forecast, as well as at influencing the addressee by manipulating with images of the future to achieve the ultimate goal of the producer of the text. We stress the crucial role of the political metaphor in structuring the text. It is the metaphor that organizes the content of the forecast both formally and conceptually. The article presents a piece of our approach to studying retrospective models of Russia's future using the methods and tools of linguistic political prognostics. The material for the analysis is the 19th century American and British political discourses (1855–1881). The paper evaluates the prognostic potential of the dominant metaphorical models (PATH, DISEASE, CRIME and FAUNA), elicits the discursive factors that shape the usage and meanings of metaphors, demonstrates the interdependence between metaphors and the images they generate and emphasizes the role of the historical context in this process.

Keywords Metaphor, 19th century political discourse, British discourse, American discourse, Russia's future, prognostic potential, linguistic political prognostics

1 Introduction

Does it matter which metaphor is used to sense the future? It certainly does. Metaphor is a conceptual model that legislates and regulates our understanding of the future. Scholars invariably emphasize the crucial importance of metaphor in such a purposeful and typified activity as political discourse interaction (cf. Watzlawick 1984, Bourdieu 1997, Blumenberg 1998, Judge 2001, Dannenberg 2002, Lakoff/Johnson 2003, Gibbs/Cameron 2008). In political discourse the future is often integrated into metaphors: metaphors are powerful tools that organize our experience (the past and the present) and create new realities (the future). Images of the past, present and future realities largely depend on the usage of metaphors that have a creative role in their structuring.

The approach we put forward is linguistic political prognostics, i. e. a new synthesis of theories and conceptions of the future advanced in Futurology Studies, Political Sciences and Cognitive Linguistics. Using the tools of these branches of knowledge, linguistic political prognostics deals with models of the future based on exploratory forecasts made by the authors of political texts. The basic constituents of the methods are models and scenarios of the future. A model of the future serves as a basis for the scenario development in the form of its linguistic representation. The central tool in any scenario is a cognitive metaphor. Particular metaphors

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that configure our understanding of the political future obtain a specific power. Depicting the future either in the most favorable light or portraying it in dark colors is a frequent and efficient means used by mass media and by politicians (cf. Chudinov/Solopova 2015). Best-case and worst-case scenarios constructed with the help of metaphors might have a strong effect on the attitudes towards the "political present" of the country and its probable political future. On the one hand, the reason for that is one of the main driving forces of all human actions – their hope that one day things will change for the better. On the other hand, metaphors are used as weapons to entrap and isolate – and even kill the whole country (cf. Lakoff/Johnson 2003).

To study the prognostic potential of political metaphors we use the data from American and British political discourses of different chronological periods, find out analogies and similarities in interpreting Russia's future that can be reconstructed from the analysis of metaphors used in these discourses. The scope of the present research is the 19th century retrospective period.

2 Theoretical context

The study of metaphors in the political discourse is one of the dynamically developing tendencies of modern Linguistics. The analysis of the works addressing the research scope shows that the study of discourse metaphors as the main tool of conceptualization and categorization of the world is central in a range of disciplines. The fact is explained by the dynamic and temporal nature of conceptualization, cognitive processes development and real-time language functioning, as well as by a continuous nature of each change that never stops.

The most typical features of discourse metaphors include their change, development of contrary connotative meanings of the same metaphor at a particular time or over a long period of time, their reshaping, transforming and extending according to cultural and experiential knowledge of those who use them. A detailed analysis of discourse metaphors of a certain time period is considered to be the upper temporal limit, the starting point of their further development analysis, which reveals the reasons of their change, the impact various discourse factors have both on the stability of a particular metaphor and on the system of metaphors in general, as well as on their transformations in the course of time.

Metaphor cannot be usefully treated in isolation, within the framework of the cognitive, socio-cultural or any other approach (cf. Clark 1997). In this case scholars obtain reliable but scattered data: the analysis is partial, incomplete and inaccurate, as it is the interaction of cognitive features and discourse factors produced by the historical moment, social development and culture that gives a full metaphorical image. Studying metaphors one can see dominant social interests and values of the society, ideals that form its culture, thus, metaphor turns to be a mirror reflecting a particular society at a certain development stage (cf. Chudinov 2013). The study of the figurative language in use can help us to better understand the way in which nineteenth-century authors tried to constitute nations through their texts (cf. White 1973: 94), which is very relevant to examine analogies, specific images and patterns of representing Russia's future in the two discourses.

In order to cover the main features of historical conceptualization, a minimum number of major parameters must be included in metaphor analysis. To study the historical evolution of the figurative language (emotions, color symbolism, political war metaphor) six major parameters are proposed for a global evolutionary model of conceptual mapping and historical conceptualization (Trim 2011: 13 f., 23). These parameters represent 'constants' which are of

primary significance throughout the language development. The historical evolution model includes: (1) thought processes that involve sensory perception and embodiment derived from our bodily experience; (2) the interface with linguistic form, which may also have an influence on modifying conceptual structures in the mind; (3) the hypothetical roles of universal trends or underlying mechanisms which promote these processes; (4) the dominant role of culture in the history of language; (5) different forms of diachronic salience present at varying times in history; and, finally, (6) the type of discourse or semantic field in which the mapping is created. These major parameters can be further subdivided into other categories or excluded from the list according to the particular objective of the study.

Within the framework of the dynamic cognition approach researchers lay emphasis on the situatedness of cognition, the embodiedness of metaphors into a certain social and cultural context (cf. Nerlich/Hellsten 2004, Chilton 2005, Musolff 2008, Zinken/Hellsten/Nerlich 2008). The focus of the metaphor here can be understood as a system of associations coded by the culture. It means that studying metaphors does not only require synchronous contexts but also involves general cultural contexts. Thus, it is impossible to understand metaphors discretely: only through their linguistic, cognitive or socio-cultural component. As language, cognition and culture are inextricably intertwined, discourse metaphors are socially and culturally situational, linguistic and extra-linguistic context-dependent, and ambiguous, i. e. they imply various conceptual meanings and tend to be differently interpreted. The metaphor's "discourse career" highly depends on two complementary factors: 1) the experience that enables the constancy of conceptual features, 2) the sufficient conceptual flexibility that enables the development of different and sometimes contrary conceptual meanings (cf. Musolff 2004).

Osborn, the founder of the archetypal metaphor theory, states that there exists a permanent demand for metaphors in any discourse, a certain "immunity" to changes (the same models are dominant both in the discourse of one country and in the discourses of different countries throughout a long period) (Osborn 1967). The scholar stresses their embeddedness in the human experience and, consequently, in the human consciousness, their dependence on the basic motives and driving forces of human beings (cf. Osborn 1967: 338 f.). Osborn's archetypal metaphor theory is supported by the findings of O'Bryan's (1986) and Harvey's (1999) works: in the former research a retrospective analysis of anti-immigration discourse (the beginning of the 20th century) shows the frequency of metaphors typical of the modern American political communication; in the latter work the author proves that the "STATE-AS-ORGANISM" metaphor is one of the archetypal source domains embedded in the human thought from ancient times. Thus, a discourse metaphor is a dynamic ensemble that exists as a unity of language, cognition, feelings, emotions and socio-cultural influences. It cannot be reduced to its linguistic, physical, cognitive, emotional, and socio-cultural components. To understand a metaphor one must explain how these components interact and overlap one another in real time.

The meanings a particular discourse metaphor has are culture-based, society-based and situation-based, i. e. they are linked to specific cultural and discourse traditions and depend on a number of situational features. Any archetypal metaphor, the one that operates in long-term paths in a given culture or cross-culturally, evolves together with the cultural component it is embedded in. Even becoming obsolete it remains latent in the conceptual system to be reactivated at a later stage as its inherent discourse stability is influenced by other factors. Single historical events may considerably increase or decrease frequency counts of a particular metaphor. Furthermore, the situational variation can over time create a semantic and pragmatic

drift that changes the dominant meaning of an archetypal metaphor. Being context-sensitive (both situational and discourse historical contexts are meant here), the archetypal metaphor can modify its culturally entrenched interpretations and evaluative connotations. Besides, the evolution of metaphors is not only determined by a stable presence of metaphors in the language and culture and their high frequency, but also by the tendency to generate "meanings that require less intellectual losses and ensure a higher cognitive effect" (Sperber 2000: 53).

The problems of metaphor variability and their dependence on the social and political situation are dwelt upon by Landtsheer (1991), who proved the interdependence between the frequency of metaphors and public crises in the Dutch political discourse (1831–1981), by Vertessen/Landtsheer (2006) who fixed the increase in the number of metaphorical models over the pre-election period as compared to the metaphor frequency over the periods between elections, by Heintze (2001) who found out some regularities of political metaphors evolution when regarding political and economic changes in Poland.

Within the framework of the dynamic research on metaphor, the scholars introduce the notions of "sleeping" and "waking" metaphors (cf. Forceville 2006, Cienki 2008, Mittelberg 2008, Müller 2008, Mittelberg/Waugh 2009). Drawing on the latest research in Linguistics, Semiotics, Philosophy, and Psychology, the scholars put forward a new approach that disputes the dead/alive dichotomy of metaphors, proposing a more dynamic model: sleeping and waking metaphors. The existence of "sleeping" and "waking" metaphors implies that the discourse metaphor is property activated in dynamics, its activation is a result of discourse interaction and, consequently, it depends on a particular context. This view implies that any "sleeping" metaphor has a potential for being activated, consequently, a potential for becoming a metaphor (cf. Barsalou 1999, Steen 2008). The analysis makes them conclude that metaphors may change their status and have various degrees of "sleeping" and "waking" components depending on a particular context they are used in (cf. Müller 2008).

Thus, when metaphors are used in any discourse their metaphorical potential is simultaneously actualized and processed. On the one hand, metaphors have certain immunity to changes, on the other hand, they are reformulated, reshaped and transformed, being influenced by extra-linguistic factors. Studying the use and the evolution of metaphors in discourse is a key element of understanding both metaphors and the society, its history and its evolution.

3 Metaphor and its prognostic function

The cognitive process of constructing a model of the future in political discourse often becomes possible due to the use of metaphor-based cognitive models.

According to Lakoff/Johnson (2003), our everyday thoughts and behavior are pierced with metaphors we normally do not realize. Linguistic studies of the last few decades have shown that metaphor is not so much a rhetorical technique but a special cognitive model used to describe, predict and create the world. In political discourse "the future" component is often integrated into a metaphor. Whereas the future is one of the abstract, less "feasible" categories (e. g. when compared with the past and the present), a constitutive property of anticipatory cognition is figurative language. The world cannot be unchangeable, its change gives rise to new knowledge based on the old patterns used in the new conditions. Modeling the future in political discourse is a complicated process; it requires certain conceptual operations that allow for linking the old and the new and for making metaphors emerge.

Politicians use metaphors to argument their ideas of the future. Bright, akin, "colorful" representations of future consequences cause a stronger reaction and more likely motivate the addressees' behavior convincing them of a real opportunity to reform the country, to improve the present and to correct the mistakes of the past. The future is supposed to be revised, processed and corrected by the present.

The review of the works on the problem of metaphor and its ability to "predict" the future allows us to differentiate the following functions of metaphors involved in constructing the future:

- Metaphors are powerful tools that organize our experience (the past and the present) and create new realities (the future) (cf. Lakoff/Johnson 2003).
- Metaphor allows us to imagine something not yet realized (cf. Chudinov 2013: 49).
- Constructing the images of present and future realities depends to a great extent on the use of metaphors (cf. Watzlawick 1984: 53).
- Metaphors specify what to expect and how to behave (cf. Kelling 1991).
- Metaphor enables us to change the social world modifying the understanding of the world and creating a new reality (cf. Bourdieu 1997: 34).
- Metaphor opposes a paradoxical insight, utopia, project, and program to the ordinary vision (cf. Bourdieu 1997: 34).
- Metaphor performs a dual function: it defends the existing order and challenges it and it supports the existing order and rebuilds it (cf. Kennedy 2000).
- Metaphor intimidates and calms down the electorate, makes them support a politician or keep silent (cf. Edelman 1988: 103 f.).
- Metaphor has the courage of hypothesizing (cf. Blumenberg 1998: 13).
- Metaphors are framed with the social world they modify (cf. Dannenberg 2002: 292).
- Metaphor is a response to the need for innovations (cf. Herman 2000: 230).

That makes us believe that metaphorical images are obviously an active force able to awaken the imagination and cause an emotional outbreak. Metaphors do not only reflect modern reality but also influence our vision of future realities and structure our view of the world. As the man has neither sense nor opportunity to physically perceive "the hurrying river of time" (the time dimension), he uses metaphors to understand what the future holds for the country. Representations of present and future realities depend to a great extent on the use of metaphors that have a creative role in their structuring. Metaphors are not only framed with political, legal, social, economic and cultural systems, they can transform these systems by changing the concept and the idea of them. Metaphors may guide future actions, i. e. they can maintain and back up the existing system, or rebuild, or even undermine its stability. Metaphorical analogies for modeling the future are the most powerful tools we have to transform the reality into the world adapted to human goals and objectives.

4 Empirical basis and findings

This article is a piece of the study of dominant political metaphors modeling Russia's future in American and British political discourses (cf. Solopova 2014, 2017). The work is performed within the framework of linguistic political prognostics. The material for the analysis is political texts of the 19th century. All the examples cited in the paper to illustrate and prove our theses have spelling, punctuation and font of the 19th-century original texts in American and British political discourses; contexts from American texts are marked in the article with the label *(US)*, from British texts with the label *(GB)*.

The parameters used to analyze systems of metaphors in the two discourses are the following:

- the general activity of metaphorical units (the correlation of metaphorical and non-metaphorical representation of Russia's future),
- the correlation of "dead" metaphors (conventional expressions from everyday language) and "alive" metaphors (novel or poetic),
- the number of metaphorical models fixed in the discourses,
- the peculiarities of dominant metaphorical models,
- their most frequent frames,
- metaphors' meanings and their prognostic potential.

The retrospective analysis of the systems of metaphorical models functioning in political discourses of the two countries allows us to fix a set of regularities in the metaphorical representation of Russia's future.

It should be noted that in the analyzed corpora (comprising 3000 contexts in each of the discourses) the non-metaphorical representation of the future prevails over the figurative representation (cf. Figure 1). The percentage indices of metaphors (the USA: 40,1 %, Great Britain: 44,8 %) include all metaphorical units, both "alive" (the USA: 24,5 %, Great Britain: 20,1 %) and "dead" (the USA: 15,6 %, Great Britain: 24,7 %).

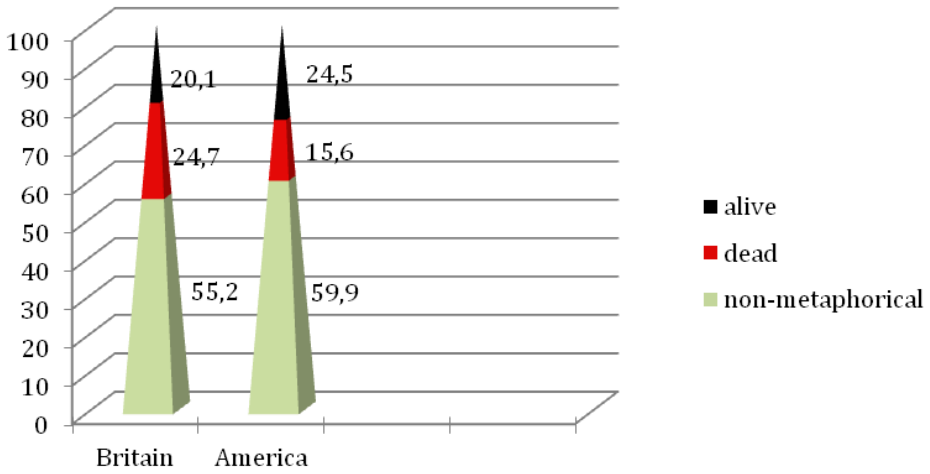

Figure 1: Comparative diagram of the representation of Russia's future in the 19th century American and British political discourses

Despite the 19th century military campaigns and the rivalry in European affairs, the metaphor creativity parameter (the use of "alive" metaphors) is comparatively low. The frequency of metaphors does not 'predict' crises and great changes in the present and the future of the Russian Empire. It is quite representative that British political discourse of the retrospective period is more metaphorical if compared with American political discourse, which is primarily preconditioned by the historical reasons: the international political situation, the Russian-British rivalry in Central Asia, in the East and in the Pacific Ocean, the military campaigns where the two countries were either rivals or allies of opposing sides. It is interesting to note that the bulk of the alive, novel metaphors fixed in representing the Russian Empire's future is typical of the

American political discourse, in spite of the fact that the general activity indices of metaphors in the American discourse are slightly lower. However, the British are more inclined to use "dead" metaphors, while the Americans tend to use "alive" ones. These findings show linguistic and cultural peculiarities of metaphorical models in political discourses of the two nations speaking one language.

The systems of metaphors modeling Russia's future in the two discourses include 17 metaphorical models (realized in 1345 contexts) in British texts about Russia, and 16 metaphorical models (realized in 1203 contexts) in American texts (cf. Table 1; five dominant models used in modeling Russia's future in each discourse are semi-bold, Roman numerals show their frequency in the discourse of each country).

Table 1: Systems of metaphorical models functioning in the 19th-century American and British political discourses

#	**"RUSSIA'S FUTURE IS ..."**	**The USA (1203)**		**Great Britain (1345)**	
1	PATH	**9,3**	**IV**	**16,6**	**I**
2	ORGANISM	6,0		6,2	
3	DISEASE	**10,5**	**II**	**11,1**	**IV**
4	FLORA	3,3		2,4	
5	INANIMATE NATURE	**9,6**	**III**	5,4	
6	CRIME	**8,6**	**V**	**13,0**	**II**
7	WAR	8,2		8,0	
8	MECHANISM	3,6		4,9	
9	RELATIONS	4,5		0,7	
10	FAUNA	**14,5**	**I**	**11,6**	**III**
11	THEATER	7,1		3,0	
12	CONSTRUCTION / BUILDING	2,8		–	
13	LESSON	3,4		2,3	
14	HOME	–		0,7	
15	GAME	3,9		**9,3**	**V**
16	RELIGION	1,8		2,5	
17	INSTRUMENT	–		1,3	
18	SPORT	0,9		0,9	
19	MONARCHY	0,9		–	

The focus here is on the dominant metaphorical models common for both discourses. The corpora under analysis yields numerous examples portraying Russia's future as PATH. Choosing a direction and a way is one of the most popular sources of metaphors in modeling the future, this metaphor being the most frequent in British discourse, and the fourth in terms of frequency – in American discourse, which primarily reflects the human's linear perception of time: its

flow from the past through the present to the future (cf. Table 2). PATH metaphors become particularly important when modeling the future as they reflect social and cultural processes of understanding "the hurrying river of time" and lay the foundation for understanding the direction the country chooses and the expediency of its movement to the future.

In the British political discourse in constructing the Russian Empire's future, the prognostic potential of the frames TRACK and OBSTACLES is most actively used:

> (1) *Onward and onward, ever on – to the Far East*, until the conqueror signs a Treaty of Peace with the vanquished British – that is due of the fixed objects of the Slavonian mind. *Every step in advance* may be painful and perilous, but the great prize is not grasped at once; *it is approached by a systematic course of stealthy advances.* (Unknown publisher 1857: 4) (GB)

> (2) We know that many countries will support us in restricting *Russia's further and future encroachments* in Europe, because their interests are deeply concerned. (Unknown publisher 1878a: 5) (GB)

The use of these two frames is predominantly connected with the Russian policy of imperial expansion. The country's orientation towards extending and broadening its territory makes its rivals wish to slow down the country. It is reflected in the use of metaphors with negative connotations that aim at modeling thousands of obstacles in the country's way, numerous barriers that restrict its movements forward and become limitations for its future: *Russia's historical path being still surrounded and obstructed by many obstacles and many trials, the difficulties cannot be suddenly overleaped, serious difficulties in its path, main obstacles, one key obstacle, a chief restriction, a significant hindrance, an obstruction, a mid impediment, a barrier*, etc.).

Table 2: Frames of the metaphorical model RUSSIA'S FUTURE IS PATH

Frame **Discourse**	**TRACK**	**MOVEMENTS**	**SPEED**	**OBSTACLES**
Great Britain (223)	89	10	44	80
The USA (112)	63	_	31	18

In American political discourse PATH metaphors are active in representing the Russian territorial extension as well:

> (3) *Russia*, like the United States, *is an improving and expanding Empire. Its track is eastward*, while that of the United States is westward. The two nations, therefore, never come into rivalry or conflict. *Each carries civilization to the new regions it enters, and each finds itself occasionally resisted by States jealous of its prosperity, or alarmed by its aggrandizement.* Russia and the United States may remain good friends until, *each having made a circuit of half the globe in opposite directions*, they shall meet and greet each other in the region where civilization first began, and where, after so many ages, it has become now lethargic and helpless. It will be your pleasing duty to confirm and strengthen these traditional relations of amity and friendship. (Seward 1861: 8) (US)

In the American political discourse among metaphors depicting Russia's future as PATH the most frequent are those belonging to the frame TRACK (*to take decisive steps, to make ad-*

vances, a single step, to work by steps, the last step before the spring, a step forward, a stride forward, its quick and long strides, Russia's path, race, glorious route, wide road, etc.). A prominent peculiarity of American political discourse in representing the Russian Empire's future is invariably positive connotations of metaphors that produce the image of the active, dynamic progress of the Russian Empire, its continuous external and internal development. PATH metaphors do not merely model Russia's movement through time and space. Being symbols of change, they point to progressive changes: the Russian Empire is constantly moving forward, to the future.

The relevance of the PATH metaphor in conceptualizing the future lies in the fact that, on the one hand, it reflects the dynamics of social phenomena and processes, Russia's moving forward from the past through the present to the future, a progressive development of the country (the best-case scenario) and, on the other hand, it allows for modeling a regressive development (the worst-case scenario) that means returning to old political regimes, crafting policies that largely look to the past.

Another common domain providing metaphors in the two discourses is that of DISEASE (the second model in terms of frequency in American discourse, the fourth in the discourse of Great Britain) (cf. Table 3).

Table 3: Frames of the metaphorical model RUSSIA'S FUTURE IS DISEASE

Frame Discourse	**DIAGNOSIS**	**CAUSES OF DISEASE**	**SYMPTOMS**	**TREATMENT**	**PATIENT'S CONDITION**
The USA (126)	34	_	7	_	85
Great Britain (149)	58	16	12	_	63

Depending on the discourse a text belongs to (American or British) DISEASE metaphors can be realized through at least two scenarios which represent its extremes – the best-case and the worst-case scenarios. The content of the DISEASE metaphor varies greatly depending on the ideological position of the author, his intentions, on the fact whether he aims at emphasizing positive aspects of the future or, on the contrary, negative ones. In British discourse the Russian Empire is shown suffering from incurable diseases. The image of the 'dying empire' makes the addressee interpret the social and political situation in the country as being unambiguously negative in the country's present and inadmissible for its future development:

> (4) We cannot here dwell upon the manifold symptoms of *Russia's unhealthiness*; but we may repeat that Alexander II owes these interior difficulties, as well as the exterior embarrassment. *The organism which has thus been thoroughly far from sound*, and *all the greater is now the difficulty of placing it in a condition of healthful development*. But, however arduous the task, Alexander II may hope to accomplish it. (Smith 1877: 2) (GB)

In American discourse the frame PATIENT'S CONDITION, as opposed to British political discourse, is mainly realized through RECOVERY metaphors. The attention is paid to positive reformations in the country:

> (5) *The Russian race is slowly recovering from an oppression.* (Jones 1878: 4) (US)

Another frequent domain providing metaphors in American and British political discourses and having a high prognostic potential is the source domain DIAGNOSIS:

(6) We are, all of us, convinced that *Russia will eventually recover from the present afflictions and "come back"*. There is still a future for Russia. (Hall 1877: 6) (US)

(7) Russia has taken the malady from her weaker neighbour. And *the present Czar may be classed in the category of the "sick man". There is sickness nigh to destruction through the whole extent of that incongruous empire.* (Pagan 1863: 5) (GB)

In British political discourse the frame comprises a list of numerous "diseases" of the Russian Empire in its present and future: *a perilous illness, abominable cancer, Russia being paralysed by a wicked enchanter, a painful malady, an untreatable illness, a generational disease, its own deadly domestic malady, etc.* The DIAGNOSIS metaphor shows the dysfunction of political, economic and social relations in the society, it explicitly expresses negative connotations symbolizing the impotence of the country's policy, its deviations from the standards and rules, impossibility of its proper functioning in the future. Both frames (PATIENT'S CONDITION and DIAGNOSIS) allow the addressers to diagnose and outline the present trends and to predict their future alternative development. It should be emphasized that in British political discourse the DISEASE metaphor characterizes the future of the Russian Empire in a strongly negative key, being an intensifier of the worst-end scenario of the future.

Within metaphors used to conceptualize Russia's future in American and British political discourses we find a large set specifically equating Russia's future to CRIME, ranking fifth and second in the system of metaphorical models correspondingly (cf. Table 4).

Table 4: Frames of the metaphorical model RUSSIA'S FUTURE IS CRIME

Frame Discourse	**CRIMINALS**	**CRIMINAL ACTIVITY**	**VICTIMS**	**TRIAL**	**DETENSION FACILITY**
Great Britain (175)	23	84	20	18	30
The USA (104)	13	56	15	5	15

In the two discourses metaphors of the frame CRIMINAL ACTIVITY are frequently used: *to stand against right and justice, to make oneself an outlaw, to rob, waste other's lands unchecked, perfidious, treacherous, cutting, carving, mangling, thieving, lying, cunning, bribery, intrigue, foul deeds, to take the law into one's hands, to act unlawfully, to offend, to coerce, to cajole, to bribe, a species of coercion, to bully, infamy, wicked schemes,* etc. (GB); *acts of aggression, robbery, Russian machinations, crime, murder, offence, felony, schemes, villainous machinations, a deceptive half truth, a fraud, a cheat, cunning,* etc. (US). The CRIME metaphor actualizing concepts of swindle and robbery aims at modeling the Russian Empire's predatory policy in the present and maintaining the current policy in the future, as well as at highlighting the need to suppress its unfair foreign policy maneuvers, baffle them, and bring Russia to justice:

(8) Russia is never at a loss for such excuses as will, in her own eyes, *justify her acts of aggression and robbery.* (Clifford/Leng 1878: 2) (GB)

(9) *We take all possible precautions against the success of Russian machinations in that direction!* (Raymond/Jones 1860: 5) (US)

CRIME metaphors are particularly active in modeling Russia's future in British political discourse, being a structured set the model ranks second in the system of metaphors modeling the future. They negate the Russian absolute monarchy as a form of government, which results in regarding the Russian Czar as the chief criminal in the present and in the future of his country:

(10) *The records of the Imperial House are deeply stained with vice and crime. Tyranny, licentiousness and murder invest the history of the Czars with the same kind of gloomy horror that we are accustomed to associate with the annals of the Caesars.* (Stoddart 1880: 5) (GB)

CRIME metaphors characterize the Russian present political system as a criminal network that poses a serious threat to the development, functioning and existence of the country and that threatens the international peace, the political stability, economic and social development of other states. A peculiar feature of the British CRIME metaphorical model is the use of the ARBITER metaphor:

(11) *The Czar is no longer the arbiter of Europe*; not even a German or Italian potentate dares to propose him openly for an example (Unknown publisher 1856: 3) (GB).

(12) *Russia* has too much to risk, even though it *is now in point of fact the arbiter of Europe.* (Mort/Mort 1870: 6) (GB)

The Russian Empire acts like a judge who shapes the future of other countries and peoples, resolving arguments, disputing resolutions, sentencing and pardoning. Depending on the extra-linguistic factors, British authors either raise Russia and its monarch to the chief and supreme judge in all disputes, High Justice who independently makes decisions on present and future foreign affairs, or lower the Russian Empire and its Czar to the level of a criminal.

In general, CRIME metaphors model an aggressive, dangerous and unpredictable situation in the present of the country that is likely to become the worst-case future. The majority of CRIME metaphors form a negative perception of the country's further development. Their connotative meanings are the following: the evil of crime is woven into Russian life; crime pervades its policies; the country has a lawless history; it has practically never been lawful, and it has the prospect of a dismal, lawless future. Conceptually metaphors of the source domain express the idea of criminality and anti-social behavior producing repulsive images of the future.

Another domain common for the two discourses is FAUNA metaphors (ranking first in American political discourse in modeling Russia's future and third in British political discourse) (cf. Table 5):

(13) In twice two hundred years *the Bear* and the Crescent shall assail, but if *the Cock and Bull* unite, *the Bear* shall not prevail. So far, so good. *The Bear* (Russia) did assail the Crescent (Turkey), but France and England (presented by the *Cock and Bull* respectively) united with Turkey, and *the Bear* was foiled. (Unknown publisher 1878b: 4) (US)

(14) Probably, if we could get to the bottom of Afghan thought, it would be that *the Russian bear* and *the British lion* were equally determined to have Afghanistan, and that *the only difference is that while the Russian comes with subtle swiftness directly to his victim, the British lion waits until he sees an opportunity to make a sudden spring.* (Reynolds/Dicks 1878: 1) (GB)

Table 5: Frames of the metaphorical model RUSSIA'S FUTURE IS FAUNA

Frame Discourse	**SPECIES**	**BODY**	**BEHAVIOR**	**HANDLING ANIMALS**	**HABITAT**
The USA (174)	56	45	49	11	13
Great Britain (156)	49	43	47	7	10

The Russian Empire's active foreign policy involves different countries in the sphere of its international relations, each representing its own social model. Thus, one of the richest sets of metaphors draws upon the frame SPECIES: *the Russian Bear, the British Lion, the British Bull, the American Eagle, the French Cock, an ursine type, a tiger, a cat, a wolf, a sheep, a sheep-dog, a gobbler, an insect, a slug, an African locust*, etc.

In the majority of metaphorical contexts with the source domain FAUNA American and British authors use the BEAR metaphor identifying the animal with the whole empire. Metaphorical meanings the BEAR metaphor has in the discourses reflect Russia's barbarism, aggression and unpredictable behavior: *to waddle up, to roar, to howl, to lash one's tail, to gnash one's teeth, to grit one's teeth, to bare one's teeth, to track one's way, to mark for a prey, to prepare for a spring, to grasp, to scratch to bleeding*, etc.:

(15) As is well known, *the bear has a fondness for honey, and will track his way a great distance to where the wild bees have filled some hollow tree. Their sting cannot hurt him, and they and their stores are entirely at his mercy.* (Unknown publisher 1878c: 2) (US)

(16) This Russian circular to every foreign representative of Russia at foreign courts is faithfully characteristic of Russian impudence; and *impudence to Russia is to Russia what the bear's skin is to the bear. To this may be added other faculties and properties of her ursine type. She can climb, and swim, and hug, and slaver.* (Jerrold 1856: 1) (GB)

The Russian Empire, bear-like, is an enduring symbol of power and true wilderness; it relies on its strength and size, and requires vast, roadless land. Despite its heavy build and awkward gait, it is an adept runner, climber, and swimmer and it is able to overcome different obstacles to get its dainty treat it loves with a guilty passion – new territories and colonies. It neither needs nor has allies as bears tend to be overwhelmingly solitary, they are used to spending time alone and considered the most asocial type of all the animals.

Metaphors that model the aggressive behavior of Russia the Bear, its power and cunning manners construct different unpredictable futures on the international political arena, which allows the USA and Great Britain to justify their own foreign policy intentions, visions, ambitions, and ideas.

BEAR metaphors in the two discourses are alive, brisk and rich in positive and negative connotations; they aim at modeling the pressure and activity of the Russian Empire's foreign policy:

(17) *Just so soon as the great Northern Bear gets wind of this irritation on the part of his neighbor, he will simply turn over, give one considerable growl, make a sudden clutch and after that, all be at peace*. The fact of the matter is, if Alexander wants Romania and Serbia sliced from the breast of the Turkey, his carving knife is ready for the work, and no other in Europe can stop him. (Duck 1876: 2) (US)

(18) *Both Turkey and China will one day become the Bear's prey;* and, far richer and of wider extent than the old Roman Empire, Russia will spread over the two hemispheres; from the Caucasus to the Rhine, from Finland to India. (Earle 1856: 1) (US)

It should be particularly noted that, as opposed to modern American discourse, where the BEAR metaphor has an entirely negative connotative meaning (rough power, rough manners, barbarism, laziness, etc.) (cf. Solopova 2017), in the 19th century the American discourse positive connotations of the metaphor are in the focus of attention: mobility, vitality, suddenness, endurance, speed, ability to cover great distances. The shift of the emphasis can be explained by the nature of the Russian expansion, by friendly relations between the USA and the Russian Empire in the 19th century. American authors predict further territorial expansion of the Russian Empire emphasizing its positive result.

It is interesting to note that when conceptualizing Russia's future in British political discourse another metaphor of the frame SPECIES becomes dominant:

(19) *All the outlying possessions of the Chinese, Russia has already seized, or is about to seize. Ere long her wolfish clutch will be on China itself, Japan she would on the instant grasp, if she dared; but her most covetous and pertinacious glance is thrown towards British India.* Now, Russia does not need or care for decent pretexts when she wishes to steal. (Lee 1861: 4) (GB)

(20) Russians, Cossacks, Tartars, Circassians, Kirghese, Bashkirs, Calmucks, and a host of other hordes – all good fighting men of their kind. They have nothing to lose. *The clime they inhabit is* one of the bleakest, coldest, most barren, most accursed climes in the universe – *fit for wolves alone – made for them, in fact.* Who could stop them? How is it that the politicians seem to have forgotten that *the Russian wolves are howling at the frontiers?* (Clifford/Leng 1876: 2) (GB)

The WOLF metaphor has a distinct negative pragmatic potential. In British discourse Russia is presented as a predator, a she-wolf with a hungry and greedy look and a mortal grip. A well-developed intellect, force, agility and speed typical of this species allow it to actively search for a prey, to easily track and hunt it, the size of the prey doesn't matter much. A strong and exceptionally large pack of Russian wolves, the Russian army, is constantly searching for a prey. Wolves are highly territorial animals; they generally establish the pack's territory far larger than they need to survive, as suitable habitat must have sufficient access to prey. Russian wolves are brought up in the rigorous climate; they are unpretentious, sturdy and fierce, which increases their chances in the fight for new preys and territories. The state borders of the Russian Empire are coming nearer and nearer to the borders of Great Britain's spheres of influence, which explains the frequent use of metaphors with negative connotations in British political discourse.

Thus, the most frequently used metaphor in modeling Russia's future in political discourses of the two countries is the PATH metaphor, which reflects the human's linear perception of time: time movement from the past through the present to the future, where the state's present "knows" and "remembers" the past and is open to the future it approaches. The linear time model allows us to see the past behind the present and to predict the future.

Another frequent domain common for the two discourses in predicting future changes is the DISEASE metaphor. Its frequency is most likely preconditioned by the organic theory

of the state and is connected with the conceptualization of any country as a biological organism whose evolution is equal to the mechanisms of biological evolution. Projecting laws of nature onto the functioning of socio-political formations actualizes the DISEASE metaphor whose significance in modeling the future consists in the fact that diagnosing the present the metaphor offers two extreme alternatives of the country's future development (the best-case scenario and the worst-case scenario).

The use of CRIME metaphors is a specific feature of modeling Russia's future in the two discourses. The negation of the Russian form of government in the 19th century and the need to change the course of its national development are in the focus of the CRIME metaphor; it serves for demonizing the Russian Empire and discrediting its political and economic systems.

Among frequent metaphors used in describing Russia's future in British and American political discourses we also find those coming from the domain FAUNA, which is, firstly, connected with the tradition of using zoomorphous characteristics in metaphorical representation of countries, which originates from the Bible. Secondly, FAUNA metaphors with negative connotative meanings of "otherness", being different, unusual, alien, and, consequently, hostile aim at forming the negative image of political opponents and rivals and their probable future.

5 Conclusion

Particular metaphors that configure our understanding of the political future have specific power. Metaphors have a strong effect on attitudes towards the "political present" of the country (the present leader, the present government, etc.) and its probable political future. Thus, metaphors in political discourse are central cognitive instruments for understanding the future. They are fraught with hidden assumptions, helping to interpret the present, postulating possible, probable, and preferable futures, generating and dictating visions of the future, reframing the worldviews.

The meanings metaphors realize driving the present either to the best-case or to the worst-case scenario are caused by the following factors:

- The model of Russia's future is discourse-dependent, embedded into a particular extra-linguistic context, dependent both on its internal policy and on the geopolitical distribution of power.
- The model of Russia's future in the discourses is to a great extent subjective, i. e. it is directly connected with the temporality of those who construct it and determined by the addresser's and the addressee's ideological and political environments, stereotypes, typical cultural and political prejudices.
- The model of Russia's future is subject-centered: it is always based upon and subject to the interests, priorities, objectives, intentions, prospects of the country whose discourse is analyzed.

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Metaphor in Terminology: Finding Tools for Efficient Professional Communication

Ekaterina Vladimirovna Isaeva

Abstract Professional communication between an expert and a non-expert, the so-called transdiscursive communication, presupposes special knowledge transfer and acquisition. Asymmetry in communicants' knowledge causes ambiguity and conceptual misrepresentation. Precise knowledge transfer in the context of transdiscursive communication can be achieved by means of knowledge mediation. In this context metaphor accomplishes the function of a transdiscursive knowledge mediation tool. This cognitive mechanism encourages conceptual mapping of specialized knowledge from a routine area to some knowledge domain. The study of metaphoricity of terms provides ground for finding language tools for cognition management.
For discourse analyses we have focused on specialized texts from scientific journals and popular magazines obtained from the Corpus of Contemporary American English as a result of the key word in context search. We aim at proving the evidence for special knowledge mediation necessity and efficiency in the context of transdiscursive communication.

Keywords Professional communication, transdiscursive knowledge communication, computer security discourse, deliberate metaphor, knowledge mediation, terminology, ontology, context model, situation model, three-dimensional metaphorical modelling

1 Introduction

The results of professional activity depend heavily on the efficiency of communication between its players, who usually make up a complicated network of participants, from scientists to common users. This means that people with different background knowledge, diverse professional competence, and various qualifications come together to accomplish their collaborative task or achieve a shared purpose. Despite communicants' aspiration for proper knowledge transfer and acquisition, the performance of this process may vary.

This situation can be described in terms of Cognitive-Discursive Linguistics. In this framework it is believed, that knowledge communication occurs in discourse, which is defined as verbally mediated professional communication (cf. Alekseeva/Mishlanova 2002). This refers to the activity, carried out in some professional sphere, and represented both in cognition of its participants in the form of mental models (context and situation models), and in language in the form of words. Such kind of interactions make up the institutional discourse. It is entitled institutional because that refers to special knowledge domains, e. g. Medicine, War, Computer Security, connected with "work-related institutions" (Freed 2015: 1). The diversity of discourse participants is explained through their belonging to different functional types of one

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institutional discourse. Functional types correspond to genres of professional communication, i. e. scientific, popular, and lay (Alekseeva/Mishlanova 2002, Utkina 2006, Utkina/Mishlanova 2008, Mishlanova 2008). Despite similarity in context models provided by the consistency of the institutional discourse the individual mental models differ due to the distinction in the functional types.

2 The problem of ambiguity in transdiscursive knowledge communication

Within a certain institutional discourse, communication between experts with different professional competence and non-experts with various background knowledge turns out to be transdiscursive, meaning special knowledge is transferred from one functional discourse to another.

The higher the asymmetry in communicants' individual mental models, the more evident is the ambiguity and conceptual mismatch between the same special knowledge transferred and acquired. This means that transdiscursive professional communication presupposes knowledge conversion. Without adequate measures taken this conversion can be done with losses and cause conceptual misrepresentation. Meanwhile, in the current information epoch, when information stored in the form of knowledge is of great value, the problem of special knowledge distortion is particularly evident.

Linguistics is the branch of science which is directly related to all other fields of knowledge, as it studies language in various forms of its existence and areas of implementation. Because of this, it is relevant to study language of professional communication from the perspective of cognitive - discursive linguistics as a tool for receiving, processing, and storing special knowledge. At the same time, the role of interdisciplinary (transdiscursive) communication becomes more important, which highlights the problem of scientific information misrepresentation.

This problem covers various fields of knowledge. The most vulnerable are the spheres with a many layered system of participants. Computer Security is a bright illustration of such many layered spheres.

3 The evolution of the research question

The effectiveness of professional communication is not a new research issue. The first attempts to study terminology as the basic tool for professional communication, date back to the 16th–18th centuries; the researchers focused on the terminology record of Anatomy (Versalius, the Royal Society), Chemistry (AL Lavuoze, Berthollet KL), Economy (J. Beckman), Biology, and Zoology.

In the 19th century the work on standardization of terminology begins, terminology theory and practice (e. g.: lexicography languages for special purposes) appear.

In the 20th century, the study of languages for special purposes becomes a branch of applied linguistics, a major contribution to the development of which was done by E. Wüster, D. Lotte, A. Reformatskiy, and others. Attention to language processes, communication, language and thinking becomes the impetus for the development of cognitive science. The most important contribution to its development is made by such famous scientists as G. Harman, U. Cheyf (identifying the principles of cognitive science), Ch. Fillmore (the theory of frame semantics), G. Lakoff and M. Johnson (the conceptual metaphor theory), R. Langacker (the

cognitive grammar), E. Roche (the prototype theory). In Russia understanding of cognitive linguistics as a new direction of research began with the appearance of "Concise Dictionary of cognitive terms", which was published in Moscow in 1996. On the basis of cognitive linguistics cognitive (epistemological) term study was formed, in which a significant role was played by such Russian scientists as L.M. Alekseeva, B.N. Golovin, E.S. Kubryakova, V.M. Leichik and others.

Linguistics of the 21st century is based on the theoretical foundations of the previous paradigms developing in the direction of cognitive studies and delving into the conceptual meaning of the term. Today, such Russian linguists as L.M. Alekseeva (2009), N.N. Boldyrev (2007), V.Z. Demyankov (2016), E.I. Golovanova (2013), L.A. Manerko (2009), S.L. Mishlanova (2011), V.F. Novodranova (2011), V.F. Tabanakova (2014), and others work in the framework of this approach. There appears to be the idea that terminology of any field of knowledge is the means of storing, processing, transmitting, and developing conceptual paradigms in science; for the central problem of cognitive term studies is the relation between terms and underlying special knowledge (Golovanova 2013: 13).

Cognitive-discursive approaches to term study offers a comprehensive research into the terminology and allows us to consider terminological units on the linguistic, conceptual, and pragmatic levels. Such an approach to the description of terminology coincides with modern trends of the leading European and American linguistic schools represented by the works of L. Barsalou (2008), G. Budin (2016), J. Engberg (2010), P. Faber (2012), R. Gibbs (2003), G. Steen (2007), T. van Dijk (2012), etc.

One of the cognitive discursive methods of studying and organizing concepts existing in some field of knowledge is the frame-based terminology (a term coined by P. Faber 2012). It is based on the assumption that the structure of a language reflects its conceptual framework, and that it is possible to understand human thinking by studying its reflections in the language (cf. Langacker 1987). One of the key units of the frame-based terminology is an event, which comprises the term's conceptual frame, the context of its situational and potential usage and its relations to other terms in the field of knowledge.

The role of metaphor in professional communication has been discussed many times by both Russian linguists (cf. L. Alekseeva, A. Chudinov, L. Manerko, S. Mishlanova, V. Novodranovoy) and foreign researchers (cf. A. Denies, Z. Keveches, T. Krennmayr, G. Lakoff, J. Littlemore, E. Semino). Metaphor is regarded as a "cognitive mechanism in which one conceptual area is partially mapped onto another conceptual area, which is in turn understood through the prism of the former one" (Isaeva/Mishlanova 2014: 8). In the language for special purposes conceptual metaphors occur in the form of metaphorical terms. Cognitive potential of metaphor in terminology lies in its ability to model the content and structure of new scientific concepts by analogy with familiar concepts from other knowledge domains or everyday life.

4 Our solution

Precise knowledge transfer in the context of transdiscursive communication can be achieved by means of knowledge mediation and adjustment in accordance with the level of communicants' professional competence. We understand knowledge mediation as an interim stage between knowledge transfer and acquisition. At this stage conceptual structures, which represent special knowledge, are transferred into a verbal form and again rendered into conceptual

structures. To objectivize this process, let us compare it with a process of signal transfer, described in the Information theory, originally proposed by Claude E. Shannon in *A Mathematical Theory of Communication* (1948).

Structurally knowledge communication can be seen as a typical system for storing and transmitting information. Let us represent this communication in the form of a flow chart, similar to C. Shannon's connection system (Shannon 1948), but adjusted to our research purposes (cf. Figure 1).

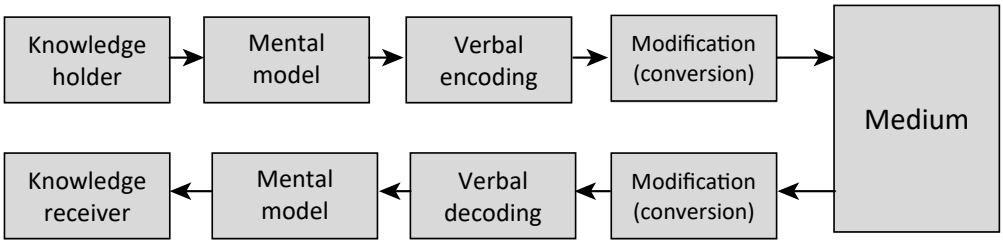

Figure 1: Knowledge communication flowchart

In this flowchart knowledge holder is the person (in our case an expert) who is going to share his or her special knowledge with another person (in our study a nonexpert), labelled as a "Knowledge receiver". The process of knowledge transfer and acquisition comprises a number of steps. First the expert's knowledge being a part of his or her ontology is extracted from this ontology in a form of a mental model. This means that not the whole ontology will be transmitted to the knowledge receiver, but only the part of it that is necessary for adequate knowledge acquisition. This important step, which facilitates redundancy elimination, is labelled "Mental model extraction". In cognitive linguistics a mental model is understood as the way an event is represented in thought and "stored in the episodic memory" (van Dijk 2012: 589). The model comprises a set of elements associated with the event, such as time, place, participants, objects, etc. Mental models "contribute to the construction of the common ground" (van Dijk 2012: 589) and enable human beings "to 'read the mind' of others through plausible and often reliable reconstructions of the mental models of others" (van Dijk 2012: 589). The form of a mental model is an efficient way for preserving knowledge due to the fact that missing elements, lost or distorted in the process of knowledge transmission or storing are easily restored or drawn upon from the event frame.

The step entitled "Verbal encoding" is intended for mental model transformation into a verbalized form of a message. Here minimal idea units (propositions) are encoded by means of the languages of general and special communication to form a message. This message is to be converted in the following "Modification" step into an oral or written text.

The medium where the knowledge is stored or transmitted causes random noise or distortions, which make knowledge reception more perplex. Here by the word medium we understand the discourse where the knowledge is being communicated, i. e. transferred and acquired, comprising the event of communication, its participants, settings. All of these influence the completeness of the initial knowledge at the moment it is being acquired.

Blocks located on the receiving side perform reverse operations and provide the receiver with information in a convenient for perception form.

The loss of a part of specialized knowledge in this complicated process is difficult to avoid not only due to the complexity of the "route" but mostly due to the mismatch between the ontology, the knowledge to be transferred is being part of (the output ontology), and the ontology the knowledge being transferred is received by (the input ontology).

Ontology as a set of concepts hierarchically related to one another to form a knowledge field is part of human conceptual system inherent in human perception. To study its complex organization, we apply the method of ontological modelling. For this reason, we go in for an applied understanding of ontology accepted in computer and information sciences as knowledge bases of a specialized type which are feasible for "reading" and understanding, alienating from their developer, and physical sharing by the users (cf. Gavrilova/Khoroshevskii 2001). According to Gruber (2009: 59 f.)

> ontology defines a set of representational primitives with which to model a domain of knowledge or discourse. The representational primitives are typically classes (or sets), attributes (or properties), and relationships (or relations among class members). The definitions of the representational primitives include information about their meaning and constraints on their logically consistent application.

T. Gruber points out the following features of the ontology. First, he notes, that "an ontology defines (specifies) the concepts, relationships, and other distinctions that are relevant for modeling a domain", and adds, that "the specification takes the form of the definitions of representational vocabulary (classes, relations, and so forth), which provide meanings for the vocabulary and formal constraints on its coherent use" (Gruber 2009). To differentiate the ontology from semantic word nets we introduce another distinctive feature, namely, hierarchy.

Hoping to find out why in some cases of professional communication output knowledge is not completely embedded into an input ontology, we decided to study premises for its inclusion.

We assume that knowledge is transferred from one person to another in patches, a number of concepts, linked together to recreate a particular event of a real or imaginary life, physical, biological, or chemical process. In the mind these recreations occur in the form of so-called context and situation mental models (cf. van Dijk/Kintsch 1983, van Dijk 2006). Situation mental models are individual representations of an event with reference to the time, participants, objects, relations, and operations. An event framed in the form of a mental model is rendered as data or "sense data" as it is put in B. Russel's philosophy, where

> sense data are taken to be mind-dependent objects whose existence and properties are known directly to us in perception. These objects are unanalyzed experiences inside the mind, which appear to subsequent more advanced mental operations exactly as they are (CRAM101 Text book Reviews 2016: 77).

Sense data occur as mental reflections of real events refracted through the prism of individual's cognition. Therefore, they are distinct from the real-life events and subjective.

On the other hand, a situation model is not only dependent on the personality of its bearer, but also on the external factors as it comprises a personal vision of an event through the frame of a context model.

Context models are dynamic pragmatic models of typical communicative situations. Context models determine collective mental representations of communication or interaction

between (among) discourse participants by people, belonging to the same epistemic group. Context models frame an ongoing event and relate it to a proper sociocultural context. In particular, they determine communicants' roles (speaker, listener, author, etc.), social roles (professor, journalist, doctor, etc.), category (gender, age, etc.), personal relations (friend, enemy, helper, etc.), aims, and intentions. One of the important functions of context models is knowledge management, because they take part in knowledge adaptation. They provide context for event acquisition. In other words, on the basis of these models discourse participants perceive real life situations and react correspondingly.

Context models in turn are restricted by discourse, which can be regarded as the media, the mechanism, as well as the result of special knowledge transmission. In particular, according to Karasik (2002: 192), discourse is "an intermediate phenomenon occurring between speech, verbal communication, and linguistic behavior, on one side and a recorded text on the other"[1]. So, it includes both, "text as a static object, occurring in the process of special communication, and dynamic unfolding processes of its production and understanding"[2] (Kibrik 2003: 4). Speech linguists share the opinion, that discourse stands for live verbalized communication, characterized by a variety of deviations from the standards of the written text. Thus, from this perspective, special attention is payed to its spontaneity, completeness, thematic coherence, and perspicuity (cf. Karasik 2002: 193). For sociolinguists discourse is communication in or between some social groups and it is studied with reference to some specific speech behavioural event (cf. Karasik 2002: 194).

As disciples of Cognitive-Discursive Linguistics (cf. Alekseeva et al. 2014), which suggests the complex study of complementary knowledge representation in language, in thought, and in communication, we stick to the theory that discourse as a verbally mediated professional (special) activity (cf. Alekseeva/Mishlanova 2002) is serviced by a language for special purposes. Because of this, discourse is terminologically rich. Terms accumulate segments of special and background knowledge in a compressed way and comprise elements of context model shared by members of epistemic community. That is why the study of transdiscursive knowledge communication inevitably leads to research into metaphoricity of terms.

5 Metaphor as a tool for knowledge communication

Recent developments in the study of metaphorical nature of terms (cf. Alekseeva et al. 2014, Bogatikova at al. 2014, Isaeva/Mishlanova 2014) have shown the potential of employing the method of Three-Dimensional Metaphorical Modelling, which allows us to examine terminology from lexicological, cognitive and pragmatic perspectives. In this respect terms are considered as part of language, thought and communication.

For our research we have chosen Computer Security discourse, since it is relatively new (about 70 years) and rapidly developing. It involves participants with various professional competences, that is why special knowledge about Computer Security is transferred from specialists both to experts and non-experts. Furthermore, lexical units belonging to language for special purposes elicit diverse conceptual content based on recipient's background knowledge and experience. This provokes disagreement in conceptual content of output and input knowledge and causes conceptual ambiguity in the process of transdiscursive special knowledge sharing. This is the rationale for our research, carried out on texts specialized for an IT

[1] Our translation.

[2] Our translation.

expert readership (scientific genre) and texts targeting an unsophisticated readership (popular genre), extracted from the Corpus of Contemporary American English (COCA).

6 Methods and data analysis

To analyze the data we have employed the method of Three-Dimensional (3D) Metaphor Modelling meant to constrain pragmatic, semantic, and conceptual aspects of metaphor (Isaeva/Mishlanova 2014). The method comprises a number of strategies: corpus analysis, thesaurus modelling (cf. Baranov/Karaulov 1991, Utkina/Mishlanova 2008), MIPVU (cf. Pragglejaz Group 2007, Steen 2010), the Five-Step Method (cf. Steen 2007, 2011), Frame semantics (cf. Fillmore 2006). The procedure is executed in succession: communicative-pragmatic analysis, semantic analysis and conceptual analysis.

Communicative-pragmatic analysis includes three steps: key word in context (KWIC) search; discourse type distinction; discourse subtype (genre) distinction. The KWIC search has been limited to the contexts of the lemma *virus* in COCA. The search has resulted in approximately 10000 contexts. To divide the contexts into discourse types we have applied the definitional analysis of a lexeme *virus*. As a result, three knowledge domains have been distinguished with reference to the meanings of the lexeme:

1) *Medicine/Virology:* "a) Any of the various submicroscopic agents that infect living organisms, often causing disease, and that consist of a single or double strand of RNA or DNA surrounded by a protein coat. Unable to replicate without a host cell, viruses are typically not considered living organisms. b) A disease caused by a virus" (American Heritage Dictionary).
2) *IT/Computer Virology:* "A computer program or series of commands that can replicate itself and that spreads by inserting copies of itself into other files or programs which users later transfer to other computers. Viruses usually have a harmful effect, as in erasing all the data on a disk" (American Heritage Dictionary).
3) *Sociology/Social Relations:* "A harmful or destructive influence" (American Heritage Dictionary).

These knowledge domains correspond to similarly named institutional discourse types: Medicine (Virology), IT (Computer Security), and Sociology (Social Relations).

For our purposes we have selected those contexts which are associated with definition 2, i. e. belong to a Computer Security institutional type of the discourse.

To subdivide the texts into functional discourse subtypes (genres) we have sorted them according to a potential professional competence of their target audience. The first group included the contexts taken from specialized computer journals (*Compute!, PC World, Communications of the ACM (CACM), Computer World*), while the second group encompassed the contexts extracted from popular magazines (*Science News, Popular Science (PopSci), Omni, The futurist*). The received concordances represent two functional subtypes of the Computer Security discourse: scientific and popular. Thus, the result of the communicative-pragmatic analysis is *virus* tokens divided into institutional discourse types, namely IT/Computer Virology, Medicine/Virology (discarded from further analysis), and Sociology/Social Relations (discarded from further analysis), and functional subtypes, namely scientific and popular.

The linguistic dimension of the 3D Metaphorical Model represents Metaphor Related Words (MRW) (cf. Pragglejaz Group 2007). The identification procedure involves MIPVU, which stands for Metaphor Identification Procedure, developed by the linguists of Vrije Uni-

versity Amsterdam. The procedure is based on comparison of contextual and basic meanings of words composing selected contexts. Those words which have contrasting contextual and basic meanings, while the former can be understood in comparison with the latter, have been tagged MRW. An example of this can be the word *virus* in *Virus attacks the computer*. The contextual meaning is "A computer program or series of commands that can replicate itself and that spreads by inserting copies of itself into other files or programs which users later transfer to other computers. Viruses usually have a harmful effect, as in erasing all the data on a disk" (American Heritage Dictionary). The basic meaning is "Any of the various submicroscopic agents that infect living organisms, often causing disease" (American Heritage Dictionary). The contextual and the basic meanings refer to different fields of knowledge, namely IT Security (the former meaning) and Microbiology or Medicine (the latter one), however the IT Security meaning can be elicited from the Microbiological or Medical one.

The conceptual dimension refers to situation and context mental models. A situation model, i. e. an individual mental representation of an event, fixes event distinctive features: space-time characteristics, participants, their relations, roles, specific actions, goals etc. This knowledge is grounded in human mind in the form of propositions, "minimal idea units consisting of small numbers of concepts" (Steen 1999a) and is elicited by words' semantics.

In this paper we are interested in a metaphorical constituent of mental models, therefore we have focused our attention on the features, which carry allusions to the source domains of metaphorical mappings. These features are examined on the basis of MRWs in their contexts with the usage of the Five-Step Method (cf. Steen 2011). The method allows recreating metaphorical mappings through the analysis of indirect comparisons and the reconstruction of indirect analogies at the text base level. Consider a specific example of the method (see example 1):

(1) *It (AntiVirusPlus) scans and removes the virus code from the infected files as it reconstructs the original data* (Oligschlaeger, Richter 1991).

According to Steen (2007) the first step is to identify the focus of metaphor. This refers to an expression activating a "concept which cannot be literally applied to the referents in the world evoked by the text" (Steen 1999b: 61). For this purpose, we have applied Metaphor Identification Procedure (cf. Pragglejaz Group 2007) and have obtained the following focuses of metaphor:

scan	
Contextual meaning	Basic meaning
"if a machine or computer program scans something, it examines it in order to look for a particular thing" (Macmillan Dictionary)	1) "to look at something very carefully, because you hope or expect to see a particular person or thing" (Macmillan Dictionary) 2) "to read something very quickly, in order to get a general idea of its meaning or to find particular information" (Macmillan Dictionary)

remove	
Contextual meaning	Basic meaning
"uninstall (a feature in Microsoft Windows that lets users uninstall and manage the software installed on their computer)" (Computer Hope)	"to take something or someone away from a place" (Macmillan Dictionary)

code	
Contextual meaning	Basic meaning
"a set of instructions that a computer can understand" (Macmillan Dictionary)	1) "a system of words, numbers, or signs used for sending secret messages" (Macmillan Dictionary) 2) "a complicated system of rules, relationships, or instructions (the genetic code)" (Macmillan Dictionary)

infected	
Contextual meaning	Basic meaning
"if a computer or disk is infected, the information in or on it has been changed or destroyed by a computer virus" (Longman Dictionary)	1) "someone who is infected has a disease that can be spread from one person to another" (Macmillan Dictionary) 2) containing bacteria or other substances that cause disease (Macmillan Dictionary)

file	
Contextual meaning	Basic meaning
"a collection of data or program records stored as a unit with a single name" (American Heritage Dictionary)	1) "a set of papers, documents, or records that you keep because they contain information" (Macmillan Dictionary) 2) "line, row, chain, string, column, queue, procession" (The Free Dictionary by Farlex)

reconstruct	
Contextual meaning	Basic meaning
"to make a copy of something that existed in the past" (Macmillan Dictionary)	1) "to build something again" (Macmillan Dictionary) 2) "(Linguistics) to deduce the form and properties of (a protolanguage or an unattested word) based on evidence from attested languages, such as cognate words" (American Heritage Dictionary)

The second step is devoted to the examination of conceptual structures elicited by the foci of metaphor. To accomplish this, we present all the concepts and their relations in the form of propositions, structurally recorded minimal idea units (cf. Steen 1999a). Each proposition consists of a predicate and one or two arguments.

P1: (SCANt/s ANTIVIRUSPLUSt CODEt/s)
P2: (REMOVEs ANTIVIRUSPLUSt CODEt)
P3: (MOD CODEt/s VIRUSt)
P4: (FROM P2 P5)
P5: (MOD FILEt/s INFECTEDt/s)
P6: (RECONSTRUCTs ANTIVIRUSPLUSt DATAt)
P7: (MOD DATAt ORIGINALt)

Here P1–P7 stand for propositions, t – target domain, s – source domain, MOD – adverbial or adjectival modifier.

The third step is aimed at an indirect comparison identification. This is done by means of splitting propositions, which contain references to both target and source domains, into two parallel lines, representing either concepts of the target or source domains. Each concept has a variable referent in the parallel domain line. These referents are signified with variables F, x, y and G, a, b substituting predicates and two arguments in the target or source domain respectively.

P1: (SCANs ANTIVIRUSPLUSt CODEt)
SIM{[]F, []a, []b

[	F	ANTIVIRUSPLUS	CODE	]t
[	SCAN	a	b	]s

P2: (REMOVEs ANTIVIRUSPLUSt CODEt)
SIM{[]F, []a, []b

[	F	ANTIVIRUSPLUS	CODE	]t
[	REMOVE	a	B	]s

P3: (MOD CODEt VIRUSt)
SIM{[]x, []b

[	MOD	CODE	VIRUS	]t
[	MOD	a	b	]s

P5: (MOD FILEt/s INFECTEDt/s)
SIM{[]x, []b

[	MOD	FILE	INFECTE	]t
[	MOD	a	b	]s

P6: (RECONSTRUCTs ANTIVIRUSPLUSt DATAt)
SIM{[]F, []a, []b

[	F	ANTIVIRUSPLUSt	DATA	]t
[	RECONSTRUCT	A	b	]s

The fourth step is devoted to the reconstruction of indirect analogies. This is done by means of filling in the empty slots, designated with variables in the third step. The concepts to be inserted instead of the variables are determined by the dictionary entries, which define correlating meanings in corresponding knowledge domains.

The pattern under analysis belongs to the scientific discourse subtype, therefore we fill in the missing slots by reference to the communicators' professional knowledge. Thus, taking into account Computer Virology's succession to conceptual frames and metaphors of Virology in medicine (cf. Mislanova/Mishlanov 2012, Bogatikova et al. 2014), we assume that the usage of the MRWs *scan, remove, code, infected, file,* and *reconstruct* might evoke mappings from a referential medical knowledge domain. We believe that this happens only at a scientific level of professional communication (cf. Hoffmann 1985, 1988) as it invokes fundamental knowledge of Computer Virology origins. In this case we obtain the following results:

SIM{
[SCAN ANTIVIRUSPLUS CODE]t
[ANALYZE DOCTOR DNA/RNA]s

SIM{
[DEINSTALL ANTIVIRUSPLUS CODE]t
[REMOVE DOCTOR DNA/RNA]s

SIM{
[MOD CODE VIRUS]t
[MOD DNA/RNA VIRUS]s

SIM{
[MOD FILE INFECTED]t
[MOD CHAIN INFECTED]s

SIM{
[MAKE-COPY ANTIVIRUSPLUS DATA]t
[RECONSTRUCT DOCTOR GENETIC-MATERIAL]s

Or, if communicators are not equipped with the knowledge on Computer Virology history and general scientific knowledge, the metaphorical constituent of the situation model might have a different a frame, e. g.:

SIM{
[SCAN ANTIVIRUSPLUS CODE]t
[READ PROOFREADER SET-OF-LETTERS]s

SIM{
[DEINSTALL ANTIVIRUSPLUS CODE]t
[REMOVE PROOFREADER SET-OF-LETTERS]s

SIM{
[MOD CODE VIRUS]t
[MOD SET-OF-LETTERS ERROR]s

SIM{
[MOD FILE INFECTED]t
[MOD SET-OF-PAPERS ERRORFUL]s

SIM{
[MAKE-COPY ANTIVIRUSPLUS DATA]t
[RECONSTRUCT PROOFREADER TEXT]s

In the fifth step we take down all the correlating concepts in the target and source domains received in the fourth step. Table 1 contains correlations representing indirect mappings in the

exemplary extract as it might be interpreted by the communicants who possess fundamental knowledge on Virology both in Microbiology/Medicine and Computer Security (see "Fundamental knowledge" in Table 1) and by the communicants who possess only applied knowledge in Computer Security (see "Applied knowledge" in Table 1). The results obtained from pattern (1) analysis are consistent with the full selected corpus described in (cf. Isaeva/Mishlanova 2014).

Table 1: Indirect mappings evoked in pattern (1)

Fundamental knowledge		**Applied knowledge**	
TARGET DOMAIN	SOURCE DOMAIN	TARGET DOMAIN	SOURCE DOMAIN
VIRUS	VIRUS	VIRUS	ERROR
CODE	DNA	CODE	SET-OF-LETTERS
INFECTED	INFECTED	INFECTED	ERRORFUL
FILE	CHAIN	FILE	SET-OF-PAPERS
ANTIVIRUSPLUS	DOCTOR (GENETIC-ENGINEER)	ANTIVIRUSPLUS	PROOFREADER
MAKE-COPY	RECONSTRUCT	MAKE-COPY	DEDUCE-FORM
DATA	GENETIC-MATERIAL	DATA	TEXT

From the mappings represented in Table 1 we extrapolate, that in scientific communication the metaphorical constituent of the situation model of the exemplary extract draws upon a correlating situation model in the source (Genetic engineering) domain. The latter introduces a virus as a pathogen, which embeds into the DNA chain. A genetic engineer aims at reconstructing damaged genetic material.

In professional communication in order to conceive the way Antivirusplus operates on a virus, interlocutors appeal to a Linguistics domain where a proof-reader corrects errors in texts.

The article deals with the scientific versus the popular discourse subtypes, that is why communication at levels lower than scientific is not taken into account.

When the metaphorical constituent of the situation model is simulated, we examine the metaphorical component of a context mental model. For this purpose, we arrange all the MRW in taxonomy with fields, denoting source domains at various explication levels. A completed taxonomy represents an integration of socially shared models of similar events. Context models have three main functions: they determine the way events are imprinted in the episodic memory of discourse participants, define the way an event is perceived by the members of an epistemic community, i. e. "a community of shared knowledge" (Haas 1989: 377), and provide successful knowledge communication.

Our objective at this stage is to simulate epistemically shared metaphorical models of the concept 'virus' in the scientific and the popular subtypes of Computer Security discourse.

The taxonomy we use includes two domains, subdivided into four basic taxons. The latter split into specific taxons:

Domain: MAN
- Basic taxon: MAN AS A LIVING BEING
  - ANATOMY
  - PHYSIOLOGY
- Basic taxon: MAN AS A SOCIAL BEING
- Specific taxon: PROFESSIONAL ACTIVITY
  - POLICY AND WAR
  - MACHINERY
  - HOUSEHOLD
  - CULTURE

Domain: NATURE
- Basic taxon: INANIMATE NATURE
- Specific taxon: LANDSCAPE
  - NATURAL PHENOMENON
- Basic taxon: ANIMATE NATURE
- Specific taxon: PLANT
  - ANIMAL

In the same way every taxon can be broken into subtaxons. We fill this taxonomy with the MRWs in compliance with the source domains of denoted concepts, activated in indirect mappings.

As a result two metaphorical models of the concept 'virus' in the scientific and the popular Computer Security discourse have been reconstructed. By means of statistic analysis we have revealed common and specific features in the models.

Thus, the taxon MAN AS A SOCIAL BEING predominates in both models (64.1 % in the scientific discourse and 57.4 % in the popular discourse). It means that both experts and non-experts conceptualize the computer virus as part of their social life. It is either a member of society, having a particular social status or role, or an object of social manipulation. It is followed by the taxon MAN AS A LIVING BEING (25.3 % in the scientific discourse and 39.3 % in the popular discourse). The least representative taxons are ANIMATE NATURE (8.6 % in the scientific discourse and 1.5 % in the popular discourse) and INANIMATE NATURE (2.5 % in the scientific discourse and 1.8 % in the popular discourse).

A slight disagreement of the models is apparent at the level of specific taxons and subtaxons. Figure 2 illustrates representativeness of specific taxons in two models.

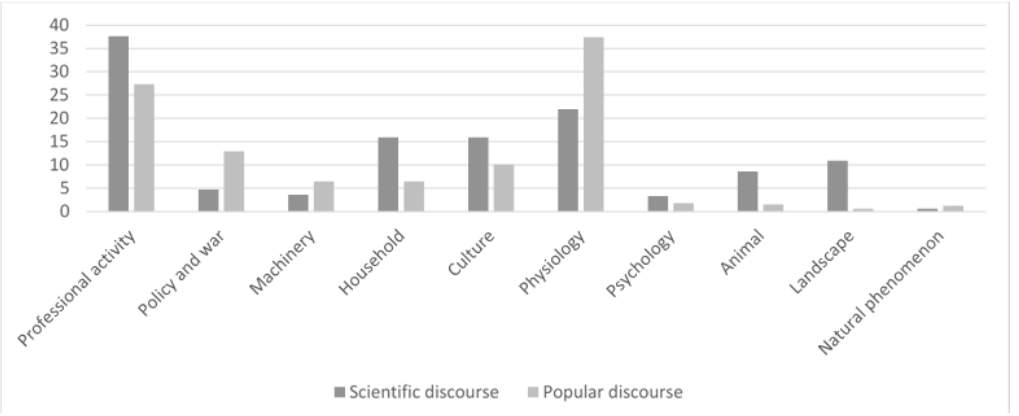

Figure 2: Representativeness of specific taxons in scientific and popular Computer Security discourse

As it is shown in the diagram high-representative taxons in both types of the discourse are PHYSIOLOGY (22.0 % in the scientific discourse, 37.4 % in the popular discourse), and PROFESSIONAL ACTIVITY (37.6 % in the scientific discourse, 27.3 % in the popular discourse). Medium-representative taxons in the scientific discourse are ANIMAL (8.6 %), HOUSEHOLD (15.9 %), and CULTURE (10.1 %), while in the popular discourse they are POLICY AND WAR (12.9 %), MACHINERY (6.4 %), HOUSEHOLD (6.4 %), and CULTURE (10.1 %). Low-representative taxons in the scientific discourse are LANDSCAPE (1.9 %), NATURAL PHENOMENON (0.6 %), PSYCHOLOGY (3.3 %), POLICY AND WAR (4.7 %), and MACHINERY (3.6 %), while in the popular discourse they are LANDSCAPE (0.6 %), NATURAL PHENOMENON (1.2 %), ANIMAL (1.5 %), and PSYCHOLOGY (1.8 %).

Specificity of the models becomes more obvious through semantic roles differentiation (cf. Fillmore 2006). We have examined semantic relations in the frames modelled in the last step of the Five-Step Analysis. As a result, all the nominative elements have been assigned with semantic roles: Agent, Counteragent, Patient, Object, Instrument, Location, and Result.

In the professional Computer Security discourse, we have encountered the following semantic roles: Agent (DOCTOR, POLICEMAN, DEFENDER, TAMER, WRITER/ARTIST), Patient (BIOLOGICAL VIRUS, CRIMINAL, ENEMY, WILD ANIMAL), Object (DEVICE, MACHINERY, ARTICLE), Instrument (TOOLS), Location (NATURE), Result (WORK OF ART, LITERARY WORK).

Thus, in the scientific discourse computer virus is conceptualized as an object of professional, home, and cultural activity, verbalized by MRWs included into the taxons LAW, MEDICINE, HOUSEHOLD, ANIMAL, and CULTURE. The taxon LAW contains MRW verbalizing the conceptual metaphors "a computer virus is a criminal", "an IT specialist is a policeman" (see example 2):

(2) *More than 42,000 distinct variants of the new malware spread over a 2-day period, according to security company Commtouch. The attackers intended for the onslaught to evade traditional signature-based virus detection, which must know about a specific piece of malware before it can catch it* (Naraine 2007).

detection	
Contextual meaning	Basic meaning
"the process of detecting someone or something" (Macmillan Dictionary)	"the work of trying to discover information about a crime so that the criminal can be caught" (Macmillan Dictionary).

The taxon MEDICINE contains MRWs verbalizing the conceptual metaphors "a computer virus is a biological virus/infectious disease", "an IT specialist is a doctor" (see example 3):

(3) *Virus Immunization Program available for an additional $ 395.00 per year* (Oligschlaeger, Richter 1991).

immunization	
Contextual meaning	Basic meaning
the attempt to prevent a computer from getting a virus by "automatically spreading across networks and patching the known exploit, weeks before the real virus hit" (http://www.google.com/patents/US7512809)	"the attempt to prevent someone from getting a particular illness by putting a substance into their body, especially using a needle" (Macmillan Dictionary)

The taxon HOUSEHOLD contains MRWs verbalizing the conceptual metaphor "computer virus is an object", e. g. *load, block, float*. The taxon CULTURE contains MRWs verbalizing the conceptual metaphors "a computer virus is a work of art/literary work", "an IT specialist is an artist", e. g. *write, create, author*.

The taxon ANIMAL contains MRWs verbalizing the conceptual metaphors "computer virus is an animal", "an IT specialist is an animal tamer" (see example 4):

(4) *NAV detected 100 percent of the wild viruses, and it found more zoo viruses than any other package (over 99 percent)* (Miastkowski 1999).

wild	
Contextual meaning	Basic meaning
situated outside the single computer or lab where it was created[3]	"a wild animal or plant lives or grows on its own in natural conditions and is not raised by humans" (Macmillan Dictionary)

In the popular Computer Security discourse, the most active semantic roles are Agent (BIOLOGICAL VIRUS, CRIMINAL, ENEMY, DOMESTIC ANIMAL, NATURAL DISASTER, WRITER/ARTIST), Patient (VICTIM), Object (INANIMATE OBJECT), Instrument (TOOLS), Location (HUMAN ENVIRONMENT), Result (WORK OF ART, LITERARY WORK).

In the popular Computer Security discourse, a computer virus is conceptualized as a problem. Thus, the most representative specific taxon Physiology contains MRWs verbalizing the conceptual metaphors "computer virus is a biological virus/infectious disease", "computer is a diseased organism" (see example 5):

[3] Our definition.

(5) *Never give out a password, and always use a virus checker to be sure that a file downloaded from the Internet isn't contagious* (Bruning 1995).

contagious	
Contextual meaning	Basic meaning
able to transmit malware code to another device[4]	"a contagious disease spreads from one person to another through touch or through the air" (Macmillan Dictionary)

Computer virus as a problem is represented in the popular Computer Security discourse by MRWs included into the taxons LAW and POLICY AND WAR, verbalizing conceptual metaphors "a computer virus is a criminal/invader", "a computer is a victim/territory" (see example 6):

(6) Could *computers themselves be used as weapons? Yes, say experts, thanks to that category of malicious computer programs known as viruses, which can alter, damage, or destroy files and computer memory and can attack and spread without their victims' knowledge.* (Gunther et al. 1994)

attack	
Contextual meaning	Basic meaning
penetrate into a computer system[4]	"to use weapons to try to defeat an enemy" (Macmillan Dictionary)

MRWs included into the taxon CULTURE verbalizing the conceptual metaphors "a computer virus is a work of art/literary work", "an IT specialist is an artist" indicate how sophisticated a computer virus is (see example 7):

(7) *The student, Onel A. de Guzman, who had been missing for several days, appeared at a news conference in dark glasses. # He did not directly say whether he had written the "ILOVEYOU" virus* (Beveridge 2000).

write	
Contextual meaning	Basic meaning
"to create a computer program" (Macmillan Dictionary)	"to create something such as a story or song by putting words together" (Macmillan Dictionary)

7 Results

While comparing semantic frames typical of the metaphorical components of context models in the scientific and the popular types of Computer Security discourse we have revealed that the former includes *a computer virus* in the role of Object and *IT specialist* in the role of Agent, whereas the latter contains *a computer virus* in the role of Agent and *a computer* in the roles of Object or Location (cf. Table 2). This rearrangement of semantic roles occurs due to the difference in real life experience of discourse participants. As far as scientific IT commu-

[4] Our definition.

nication includes experts who intend to stop virus influence, the metaphorical model of the concept 'virus' in the scientific Computer Virology discourse implies the idea of "suppression of aggression". Meanwhile non-professional communication includes users who suffer from virus malicious activity thereby in the popular Computer Security discourse the idea of "succumbing to aggression" is implied.

Table 2: Rearrangement of semantic roles in scientific and popular types of Computer Security discourse

Scientific Discourse	**Popular Discourse**
Agent (DOCTOR, POLICEMAN, SOLDIER, TAMER)	Counteragent (VIRUS, OFFENDER, ENEMY, WILD ANIMAL)
Instrument (EQUIPMENT, MECHANISM, TOOL)	Agent (VIRUS, OFFENDER, ENEMY, WILD ANIMAL, NATURAL DISASTER)
Counteragent (VICTIM, DISEASED ORGANISMS)	Instrument (WEAPONS)

8 Discussion

This rearrangement of semantic roles occurs due to the difference in real life experience of discourse participants. As far as scientific IT communication includes experts who intend to stop virus influence, the metaphorical model of the concept 'virus' in the scientific Computer Virology discourse implies the idea of "suppression of aggression". Meanwhile non-professional communication includes users who suffer from virus malicious activity, therefore in the popular Computer Security discourse the idea of "succumbing to aggression" is implied.

Based upon the results obtained we come to the conclusion, that even though the analyzed data belongs to the same discourse type (i. e. Computer Virology) and it represents relatively analogous sets of metaphorical models, we have revealed rearrangement of semantic roles in metaphor frames. This proves that the way a scientific entity is conceptualized, depends on a person's real-life experience, and an attempt to transfer original scientific data to non-experts might fail and/or lead to conceptual misrepresentation.

The way to avoid this is mediation of special knowledge in the process of its transdiscursive communication. We believe that mediated special knowledge preserves its validity, as far as it contains "veridical data received as a result of scientific research but released from system-related context" (Chernyavskaya 2004: 5). The process is streamlined when knowledge transfer (sending) on one side and perception (receiving) on the other side are initiated as a conscious deliberate act of knowledge communication, which should include the additional step of special knowledge transformation both on conceptual and language levels (cf. Figure 3).

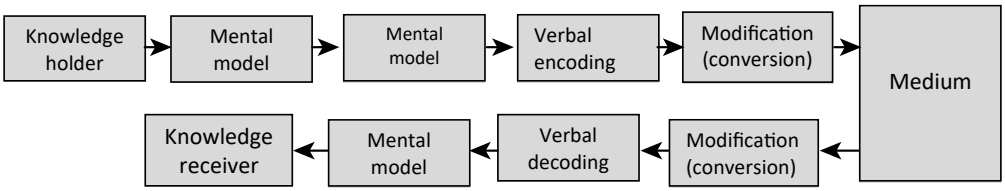

Figure 3: The flowchart of knowledge communication with internal mediation

In case the knowledge sender is aware of the metaphors, which the knowledge to be transferred is conceptualized with by the receiver (this means the expert employs the results of a preliminarily carried out cognitive discursive research in the corresponding discourse), mediation will be achieved with only one additional step of the initial mental model transformation. The following step of verbal encoding will be drawn from the obtained mental model. The rest of the steps will be preserved without any change.

Meanwhile in most cases of real professional communication the sender is an expert in his knowledge area but is not able to underpin his or her special knowledge transfer with any cognitive linguistic data. Due to this it is reasonable to introduce the third participant into the process of knowledge communication. The mediator (a linguist-cognitivist) decodes verbal data back into conceptual structures using the Five-Step Method. Then he or she transforms the situation model into the one, which correlates with the context model obtained with the Three-Dimensional Modelling. After that the conceptual data is encoded back into a verbal form (cf. Figure 4).

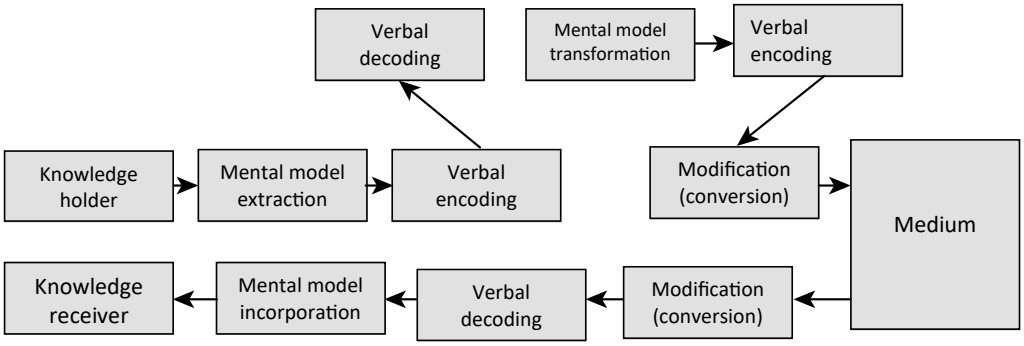

Figure 4: The flowchart of knowledge communication with external mediation

In such way conceptual metaphors and semantic frames can be preprogrammed to ensure adequate knowledge acquisition.

A mediator can provide specialized knowledge translation by intentional usage of certain language units for conceptual reframing. In professional communication deliberate (targeted) usage of terms helps to adjust expert knowledge to a nonexpert experience, and to dispose the receiver to unbiased perception of transferable knowledge (cf. Bogatikova et al. 2014). One form of deliberate specialized language usage is direct metaphor (see the example below). Together with intentional "semantic roles distribution" (Fillmore 1968) it regulates framing.

> *Computer viruses got their name from what White calls "an obvious but deep biological analogy".* ***Like biological viruses, the computer versions replicate by attaching themselves to a host*** *(a computer program* ***rather than a human cell) and then co-opting the host's resources to make copies of themselves. Infection can lead to death.*** [...] *Both research groups caution that* ***in nature, no defence system remains perfect forever. Just as white blood cells and viruses engage in a delicate dance, each evolving to outwit the other, so will computer viruses and antivirus technology****, White says* (Christensen 1999).

The situation starts with *virus* and *malware* in the Agent role as a voluntary initiator of the actions expressed by the predicates *replicate*, *attach*, *co-opt* and *make copies*. Similarly, *program* and *crash failure* perform the Goal role, that is the location or entity the Agent moves to. Such role distribution fits a nonexpert "succumbing to aggression" frame which provides expert knowledge adjustment. Direct metaphors as an efficient tool of specialized knowledge mediation provide targeted framing and results in optimized knowledge communication (cf. Table 3).

Table 3: Semantic roles distribution in direct metaphor

Role	**Target**	**Source**
Agent	*computer virus*	*biological virus*
Goal	*make copies*	*replicate*
Goal	*program*	*cell*
Agent	*malware*	*infection*
Goal	*crash failure*	*death*
Location	*computer environment*	*nature*
Agent	*antivirus software*	*defence system*
Agent	*antivirus technology*	*white blood cells*

9 Conclusion

In this article, we have addressed the problem of special knowledge misrepresentation in the process of its transfer. We have shown that this issue should be considered from different angles and the solution is complex, multistage, and can be achieved cooperatively by experts from various areas. Our approach is based on Cognitive-Discursive Linguistics. To investigate the problem and prove its topicality we have applied our method of Three-Dimensional Metaphorical Modelling. To explain the errors occurring in the process of professional communication, we have reprised the concepts of ontology and mental models. To objectivize the steps of special knowledge communication, we have referred to the Mathematical Theory of Communication.

As a result, we have come to the conclusion that special knowledge mediation solves the problem of conceptual ambiguity. The implementation of high quality mediation requires cooperative efforts of knowledge domain experts and linguists/cognitivists.

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Metaphorik im Kommunikationsbereich der Sportfachsprachlichkeit

Wenke Mückel

Abstract Metaphorical elements are a highly productive language means in live reports about sport events on TV. They occur in different relations to what is simultaneously seen on screen and depend on the reporter as well as on the special kind of sport. But nevertheless, general structures and functions of metaphors in those medium-bound oral texts can be indicated; as one of the markers they contribute to what is often called "language of sport" or maybe rather "communicative template of sport". Examples taken from TV reports of the European Football Championship and the Olympic Games (both took place in 2016) are used to illustrate this character of metaphorical expressions in sport reports on TV.

Keywords Metaphorik, Sportsprache, Live-Bericht, Sportübertragungen im Fernsehen, Sportfachjargon, Fernsehreportage

1 Von *Rohdiamanten* und *Modellathleten*

Sucht man neben dem sportlichen Event auch eine sprachliche Unterhaltung, bieten sich Live-Sportberichterstattungen im Fernsehen an. Zwar ist der Grad des sprachlichen Unterhaltungswertes auch an den zuständigen Kommentator und seinen persönlichen Stil sowie seine momentanen (sprachlichen) Eingebungen während des ablaufenden Geschehens gebunden, jedoch lassen sich personenunabhängige Grundmuster erkennen, die des Öfteren unter dem Begriff *Sportsprache* subsumiert werden (vgl. Burkhardt/Schlobinski 2009). Ein fester Bestandteil dieser Kommunikationsform sind metaphorische Ausdrücke, wie z. B. die sportartenübergreifende Metapher *Rohdiamant*. Diese Metapher scheint universell, d. h., sie ist tragfähig im Pferdesport zur Bezeichnung junger, noch in der Reifung befindlicher Champion-Pferde genauso wie in allen anderen Sportarten zur Bezeichnung junger, hochtalentierter, noch in der Entwicklung befindlicher Sportler und Sportlerinnen. Eine ähnliche, allerdings auf Personen und dort überwiegend männliche Sportler beschränkte Anwendungsbreite findet eine Metapher wie *Modellathlet*.

Die Nuancen des Einsatzes von Metaphorik beim Berichten in Sportzusammenhängen bestehen aber nicht nur in der Genderfrage und im Personenbezug, sondern auch in der Frage der medialen Präsentation des Sportereignisses; insofern kann das Merkmal „metapherreich", das einer „Sportsprache"[1] prinzipiell zugeordnet wird (vgl. z. B. Beard 1998: 3), genauer

[1] Die Bezeichnung *Sportsprache* wird im zweiten Abschnitt problematisiert; sie entstammt älteren Publikationen, wie z. B. denen von Beard: „The Language of Sport" (1998), Dankert: „Sportsprache und Kommunikation" (1969), Schneider: „Die Sprache des Sports" (1974).

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an verschiedenen Präsentationsformen untersucht werden. Bislang wurde bei der Analyse der Sprachlichkeit in der Sportberichterstattung ein starkes Gewicht auf die Darstellung in Zeitungstexten gelegt, u. a. als Vergleich von seriöser und Boulevardpresse oder auch als kontrastive binationale Zeitungstextstudien (vgl. z. B. Sverrisdóttir 2003). Die Merkmale einer „Sportsprache" wurden demzufolge auch vorrangig aus der Analyse von Zeitungstexten gewonnen, jedoch ist das Spektrum medialer Präsentationsformen und der daraus resultierenden je spezifischen Textmuster im Kommunikationsbereich des Sports äußerst vielschichtig (vgl. Überblick bei Simmler 2009).

2 Domänenbezogene Kommunikation im Sport

Die Kommunikation im Bereich des Sports könnte grob nach der Varietätenausprägung und nach der medialen Präsentation sortiert werden. Varietätenbezogen wäre beispielsweise zwischen Sportfachsprache (inklusive einer Sport*arten*fachsprache und einer Terminologisierung in Regelwerken), (Sport)fachjargon und (Sport)fachslang bzw. sportbezogener Umgangssprache sowie Sprache der Sportberichterstattung zu unterscheiden (vgl. Dankert 1969). Diesbezüglich wäre außerdem zu berücksichtigen, inwiefern sportsprachliche Begriffe bereits entterminologisiert wurden und in die Alltagssprache vorgedrungen sind (z. B. Wendungen wie *das Handtuch werfen* oder *k.o. sein* aus dem Boxsport), sodass sich bei deren Verwendung ein alltagssprachlicher in den fachlichen Kommunikationsbereich mischt, der aber mit ehemals fachsprachlichen Ausdrücken operiert.

Die Graduierungen und Mischungen – möglichweise mit Ausnahme der Regelwerke – sind allerdings abhängig von der medialen Aufbereitung, von der Textsorte, von Nutzer/Sender und Empfänger, von der Funktion und von der Sportart (vgl. Simmler 2009). Aufgrund dieser Bandbreite stellt sich die Frage, ob „die Sportsprache" als eine identifizierbare Varietät eingestuft werden kann und ob es sich in diesem Fall um einen Funktiolekt, einen Mediolekt, eine Sondersprache oder mitunter auch einen Soziolekt (z. B. hinsichtlich der kollektiven, formelhaften Gesänge von Fans in Fußballstadien oder der Sprache zwischen Trainer und Aktiven) handelt. Ein günstigerer Ansatz zur Erfassung der Komplexität von „Sportsprache" und ihrer Eingebundenheit in öffentliche, halböffentliche und private Kommunikationsakte könnte es sein, verschiedene Kommunikationsbereiche innerhalb des Sportspektrums zu unterscheiden und darin wiederum unterschiedliche Texttypen:

> Da es in der Forschung nicht gelungen ist, eine Varietät Sportsprache zu begründen […], stellt sich das Problem, auf welche Weise repräsentative Aussagen über rhetorisch-stilistische Eigenschaften der Sprache des Sports gewonnen werden können. Als erstes ist es notwendig, den Kommunikationsbereich des Sports zu begründen und die zu ihm gehörenden Sportarten zu benennen, und dann zweitens diejenigen Sportarten auszuwählen, die die Analysegrundlage bilden sollen, da nicht alle Sportarten zugleich behandelt werden können und zu den meisten Sportarten keine sprachwissenschaftlichen Analysen vorliegen. (Simmler 2009: 2292 f.)

Zum einen wird der Ansatzpunkt für die Erschließung der sprachlichen Merkmale von Sportkommunikation somit in einer Anbindung an konkrete Sportarten gesehen, was den Gedanken der Sport*arten*fachsprache stützt – in der vorliegenden Studie ist dies vorrangig durch die Auswahl der *Fußball*-Europameisterschaft 2016 erfolgt. Der zentrale Grund dafür ist, dass Fußball die präsenteste Sportart im deutschen Fernsehen ist, sodass sich „Sportsprache" in

der Live-Berichterstattung häufig in Gestalt der Fußballfachsprache zeigt. Aus dieser Präsenz resultiert vermutlich auch, dass die Fußballfachsprache eine der am besten untersuchten Sportfachsprachen ist, wenn auch mehrheitlich in Zeitungstexten und Rundfunkreportagen. Um aber auch auf sportartenübergreifende Phänomene bezüglich der Metaphorik schließen zu können, werden die Olympischen Sommerspiele 2016 als zweites Ereignis der Live-Berichterstattung im Fernsehen herangezogen. Allerdings war die Live-Berichterstattung im deutschen Fernsehen auch hier nur auf eine Auswahl an Sportarten begrenzt, die u. a. den Fußball eingeschlossen hat. Außerdem zeigt sich, dass die Berichterstattung zu den einzelnen Sportarten unterschiedlich metaphernreich gestaltet wurde – der Fußball steht an der Spitze –, was möglicherweise auf die unterschiedlichen Bekanntheitsgrade zurückzuführen ist: Da Fußball grundsätzlich viel Sendezeit einnimmt, bietet sich Raum für ästhetische Sprachspiele und die Ausbildung markanter persönlicher Sprachstile bei den wohlbekannten, sprachlich mitunter auch konkurrierenden Fußballkommentatoren. Bei den dem Zuschauer eher unvertrauten Sportarten leistet der Kommentator neben der sprachlichen Begleitung des konkreten Wettkampfgeschehens oft auch Erklärungsarbeit bezüglich der Regeln, der Besonderheiten und der Entwicklung der jeweiligen Sportart; außerdem sind diese Kommentatoren ansonsten nicht so oft für diese Sportart im Einsatz, sodass auch deshalb der Stil sachlicher und terminologischer wirkt. Dies scheint dadurch bestätigt, dass langjährige Kommentatoren, die regelmäßig in einer Sportart die Berichterstattung übernehmen und zu Experten bzw. Insidern der Sportart geworden sind, auch häufiger auf besondere sprachliche Mittel zurückzugreifen scheinen: Im Material zu Olympia ist auffällig, dass neben Fußball vor allem Pferdesport und Tennis – beides durch in diesen Sportarten erfahrene Kommentatoren begleitet – tendenziell metaphernreich kommentiert werden, während beispielsweise Judo als selten im Fernsehen gezeigte Sportart weniger metaphorisch, sondern recht terminologisch kommentiert wird (z. B. durch Bezeichnungen der Wurf- und Bodentechniken).

Das sprachästhetische Spiel, z. B. mit Metaphern, ebenso wie der Grad der Fachsprachlichkeit bzw. der Anteil erklärender Paraphrasen zu Termini beziehen sich folglich zum einen auf die Expertise und Erfahrung des Kommentators, zum anderen aber auch auf das erwartete Publikum: „The use of specialist language does depend, though, upon a shared understanding between commentator and viewer." (Beard 1998: 72) Beim Fußball scheint dem Zuschauer eine höhere Fachkundigkeit zugetraut zu werden als bei Sportarten, die selten(er) im Fernsehen ausgestrahlt werden. Wenn Kommentatoren davon ausgehen, dass die Sportart nicht besonders vertraut ist – beispielsweise weil sie zum ersten Mal eine Sendezeit im Fernsehen erhält –, passen sie ihre Fachsprache wie auch sportartentypische Metaphorik (z. *B. blau gehen*, in Ausdauersportarten verwendeter Ausdruck für Konditionsprobleme) über Entterminologisierung, Paraphrasierung und Verzicht auf „Insider"-Metaphorik sprachlich an ein Laienpublikum an.

Neben der Berücksichtigung der Popularität einer Sportart bei der sprachlichen Untersuchung und der Anbindung des Kommunikationsbereichs des Sports an konkrete Sportarten wird in der o.g. Aussage von Simmler (2009: 2292 f.) zum anderen auf die Vielgestaltigkeit des Kommunikationsbereichs hingewiesen, die es zu rahmen und zu kategorisieren gilt, um sprachliche Kennzeichen zu bestimmen. Einer der Teilbereiche ist dabei die Live-Berichterstattung im Fernsehen.

2.1 Das kommunikative Format Live-Berichterstattung im Fernsehen

Ein zentraler Texttyp im Kommunikationsbereich des Sports ist der Bericht. Ungeachtet dessen, dass auch der Begriff *Bericht* facettenreich ist, kann unter der Idee einer Typisierung doch eine Art des textuellen Rahmens von *Sportbericht* ausgemacht werden. Zu dieser Rahmung gehört zum einen die Differenzierung von medial schriftlichen Varianten (z. B. Zeitungsbericht, Detailbericht im Internet) und medial mündlichen Varianten (z. B. Radiobericht, Fernsehbericht). Zum anderen gehört aber auch die Frage die Unmittelbarkeit des Berichtens dazu: So sind z. B. Live-Bericht in Fernsehen, Radio und Live-Ticker diesbezüglich ähnlich und unterscheiden sich von einer nachträglichen Ereignisdarstellung beispielsweise in der Tageszeitung, im Videotext oder in der zusammenfassenden Fernsehreportage. Parallel dazu ist auch das jeweils spezifische Potenzial des Mediums von Bedeutung, d. h. die Frage, ob es sich um Zeitung/Zeitschrift/Fanzine bzw. Magazin, Rundfunk, Fernsehen, Internet oder Printtext (z. B. Regelwerk, Handbuch, Trainingslehre, Dokumente, expositorische Texte wie Wettkampfpläne und Ergebnisübersichten) handelt.

Der Texttyp der Live-Berichterstattung im Fernsehen ist unter diesen Gesichtspunkten als ein medial und konzeptionell mündlicher Text[2] zu klassifizieren, der quasi-simultan zur Ereignissituation produziert wird und dabei die spezifischen audiovisuellen Potenziale des Mediums Fernsehens nutzt. Die medial aufbereitete Kommunikationssituation bei der Live-Berichterstattung im Fernsehen kann zusammenfassend so charakterisiert werden:

> […] dass die Produktion des Textes durch den Kommunikator (Reporter/Kommentator) zeitgleich mit der Ausstrahlung und der Rezeption des Textes durch den Zuschauer erfolgt. Dabei liegt zwischen Text und Bild eine synchrone Relation vor, denn beide lassen sich dem gleichen Zeitpunkt zuordnen und werden synchron wahrgenommen. (Bezüglich des Synchronitätsbegriffes könnte eine Relativierung erfolgen, indem unterschiedliche Grade von Asynchronität angesetzt werden.) Bezüglich des räumlichen Verhältnisses ist m.E. von einer asyntopen Relation auszugehen, da bei einer Live-Sportübertragung der Reporter als Sprachquelle weder im Bild sichtbar ist noch sich direkt am Wettkampfort (also dem Ort, den der Zuschauer im Bild sieht) befindet, sondern in der Reporterkabine; er verfolgt meistens das Geschehen, das er kommentiert, anhand derselben (Fernseh)bilder, die der Zuschauer empfängt. (Mückel 2009: 202 f.)

Durch diese besondere Konstellation werden die sprachlichen Elemente so ausgewählt, dass sie in der von Kommunikator und Rezipienten geteilten Situation des Sporterlebnisses die Funktion übernehmen, zu erklären und zu kommentieren, zu vergleichen, Parallelitäten herzustellen, zu emotionalisieren, zu bewerten, zu veranschaulichen und zu illustrieren, außerdem wird der Insiderstatus des Kommunikators unterstrichen (vgl. Mückel 2009: 202 f.)

Diese generell für die Live-Berichterstattung zu Sportwettkämpfen feststellbaren kommunikativen und funktionalen Kennzeichen der Fernsehübertragung sind im Wesentlichen identisch mit den spezifisch für den Fußball – als der am häufigsten im deutschen Fernsehen live kommentierten Mannschaftssportart – geltenden. Deshalb kann im Umkehrschluss die vorrangig an der Fußballberichterstattung ausgerichtete Definition für die „Ganzreportage im Fernsehen" (Simmler 2009: 2312) bezüglich der Merkmale der Kommunikationssituation

[2] Bei dieser Einordnung erfolgt eine Orientierung an dem gängigen Nähe-Distanz-Modell von Koch/Oesterreicher (1994).

sowie hinsichtlich der sprachlichen Elemente *Initiatoren* (Redemittel und Textkomponenten zur Ankündigung der Übertragung), *Terminatoren* (Redemittel und Textkomponenten zum Beenden der Übertragung), *Makrostrukturen* (chronologische Gliederung und Anordnung der Textbausteine), *Satztypen* und *Lexik* (hierbei kann Metaphern eine wichtige Bedeutung beigemessen werden) auf weitere, im Fernsehen für die Live-Berichterstattung ausgewählte Sportarten übertragen werden; insofern ist die im Folgenden gegebene Definition im Kern für die Live-Sportberichterstattung in den meisten Sportarten zutreffend:

> Die ‚Ganzreportage' zu Mannschaftsspielen im Kommunikationsbereich des Sports ist im Medium Fernsehen eine Textsortenvariante, durch die extern ein Spielgeschehen simultan zu seinem Ablauf einem mehr oder weniger interessierten Zuschauerkreis durch einen visuellen Kommunikationskanal technisch-bildlich über ein Studio vermittelt und von einem oder zwei Reportern von einer Sprecherkabine aus begleitet wird, die intern durch einen auditiven Kommunikationskanal durch sinnkonstituierende Merkmalbündel aus Initiatoren, Terminatoren, Makrostrukturen, Satztypen und Lexik die Ereignisse auf dem Spielfeld näher erläutern und kommentieren, ohne den Ausgang des Spiels zu kennen. (Simmler 2009: 2312)

2.2 Sprachlichkeit in der Sportberichterstattung

Wie sich mit Blick auf den gesamten Kommunikationsbereich Sport eine Vielfalt zeigt, so ist auch für die enger gefasste Bestimmung sprachlicher Merkmale festzustellen: Vergleichbar dem Phänomen Jugendsprache ist es auch im Bereich des Sports schwierig, eine „Sportsprache" auszumachen und ihre Varietätenmerkmale zu bestimmen. Gleichwohl gibt es – auch hier der Jugendsprache vergleichbar – wiederkehrende sprachliche Muster, grundlegende sprachliche Attitüden und frequent sowie situationsübergreifend auftretende Kennzeichen, die der auf sportliche Ereignisse bezogenen Kommunikationsweise eine erkennbare Prägung geben bzw. „zu einer eindeutigen Textsortendifferenzierung und zur Kennzeichnung und Abgrenzung dieses Kommunikationsbereichs" (Simmler 2009: 2315) beitragen. Zu diesen sprachlichen Mitteln gehören:

- Verwendung von Kurzwörtern und Abkürzungen,
- Alliterationen und Gleichklänge,
- spezielle Namengebungen, Beinamen, Spitznamen,
- generelle Wortspiele, Wortspiele mit Eigennamen,
- Superlativ- und Hyperbolstil (u. a. auch metaphorisch realisiert),
- Nutzung von Phrasemen (u. a. auch von idiomatischen sowie methaphorischen),
- Nutzung von Vergleichen (u. a. auch von bildlichen Vergleichen),
- Nutzung spezifischer Termini (u. a. auch metaphorischer, z. B. *das Team mauert/rührt Beton an*),
- Metaphorik, besonders aus den Bildbereichen Emotionen/Psychologie, Kampf, Ästhetik und Körperlichkeit, Technik sowie Theater.

Die fünf letztgenannten Aspekte weisen ein metaphorisches Potenzial auf bzw. sind – im Falle des letztgenannten Aspekts – metaphorisch (vgl. Übersicht unter 3.2). Damit ist über die Hälfte der typischen sprachlichen Mittel im Kommunikationsbereich des Sports dadurch gekennzeichnet, dass *bewusst* und *zweckgerichtet* Facetten und Erscheinungsformen von Metaphorik eingesetzt werden:

> Specialist language appears in sports commentary for at least two reasons. First, it is a means of economy in language. ‚Pearce's cross', says in two words what would otherwise need many more, i. e. ‚Pearce kicks the ball high from the side of the pitch into the middle'. Second, it can add colour and drama to the account, often by using metaphorical description. For example, calling Ince's shot a ‚strike' emphasises its aggressive force by likening it to a military onslaught. (Beard 1998: 72)

3 Metaphorische Elemente der Live-Sportberichterstattung im Fernsehen

Neben den eigentlichen Metaphern im engeren Sinn zeigt sich Metaphorik auch häufig bei Phrasemen, Vergleichen und sportartspezifischen Begriffen bzw. Termini. Damit können mehrere Arten von Metaphorik in den Live-Sportberichten erfasst werden, die mittels verschiedener Kategorien von Sprachelementen realisiert werden. Darüber hinaus treten Metaphern in unterschiedlichen Strukturen auf, sodass sie auch dahingehend näher differenziert werden können. Außer der strukturellen und kategorialen wäre auch eine funktionale Betrachtung möglich, die allerdings genauer durch die Detailanalyse von einzelnen Berichterstattungen zu leisten ist, da für eine Aufschlüsselung verschiedener Funktionen von Metaphern in einem Bericht der Sprachkontext sowie die Anlage des Gesamttextes berücksichtigt werden müssten; dies wird wegen des gewählten Verfahrens der Global- und Grobanalyse, die auf die Wahrnehmung von Strukturen und Häufigkeiten beim einmaligen Rezeptionsvorgang zielt, nicht berücksichtigt.[3]

Anhand von Sprachmaterial, das während der Live-Übertragungen im Fernsehen mitgeschrieben wurde, können wiederkehrende Strukturen der Metaphernbildung und Annahmen über gängige Übertragungsverfahren abgeleitet werden. Dabei handelt es sich nicht um eine systematische Korpusanalyse, sondern um eine Sammlung von Sprachmaterial während des Rezeptionsvorgangs. Der Fokus lag demnach nicht darauf, eine begrenzte Zahl von vollständig mitgeschnittenen Ganzreportagen im Anschluss durch mehrmaliges Wiederholen bezüglich der Metaphernverwendung zu untersuchen – dies wäre für die Ermittlung der Funktionen, die Metaphern bei der Textkonstituierung einnehmen, ein möglicher Weg. Da aber nicht die Funktionalität der Metaphern bei einer bestimmten, einzelnen Berichterstattung, sondern die Frage der prinzipiellen Art und generellen Häufigkeit von Metaphern in der Live-Sportberichterstattung im Zentrum standen, wurde dokumentierend beobachtet. Dabei ging es darum, den Kommunikationsakt zwischen Kommentator und Zuschauer in seiner Einmaligkeit und Flüchtigkeit bestehen zu lassen und somit authentisch und unmittelbar die Wirkung von Metaphern auf die Rezeption zu überprüfen – eine solche Wirkung gilt in dieser Studie dann als erzielt, wenn der Ausdruck für mich als Zuschauer metaphorisch markiert und damit dokumentationswürdig, d. h. zum Mitschreiben, war.

Mit dieser Vorgehensweise sollte folglich zum einen der natürlichen, einmalig ablaufenden Kommunikationssituation Rechnung getragen werden, in der sich der Fernsehzuschauer bei der Rezeption einer Live-Sportübertragung befindet. Zum anderen begründet sich das methodische Verfahren aus dem Untersuchungsinteresse: Die Studie richtet sich auf die Erfassung eines reporter- und ereignisübergreifenden metaphorischen Stils der (generellen) Live-Sport-

[3] Grundsätzliche Funktionen von sprachlichen Stilmitteln in der Live-Sportberichterstattung, die auch weitestgehend auf Metaphern zutreffen, sind in Abschnitt 2.1 aufgelistet und werden am Ende in Abschnitt 4 für Metaphern zusammenfassend benannt.

berichterstattung im Fernsehen; sie soll keine Detailanalyse der Metaphorik bei ausgewählten Einzelreportagen sein, weil dies zu speziell und situationsabhängig für eine Verallgemeinerung hinsichtlich der Metaphorik im Bereich der Sportfachkommunikation bei Live-Übertragungen wäre.

Den Datenpool bilden zum einen die Vorrundenspiele, die Achtel-, Viertel- und Halbfinale sowie das Finale der Fußball-Europameisterschaft 2016 und zum anderen die Live-Übertragungen zu Olympia 2016 in den Sportarten Fußball, Handball, Volleyball, Tennis, Pferdesport, Rudern und Judo.

3.1 Sprachstrukturelle Merkmale von Metaphern der Sportberichtsprache

Typische Strukturformen, nämlich Substantiv-, Verb- und Adjektivmetaphern sowie Prädikativa (vgl. Kohl 2007: 46 ff. und Mácha 2010: 48 ff.), bilden auch im Bereich der Live-Sportberichte die Grundlage der Metaphernbildung. Zunächst können diese Strukturformen wortartenbezogen oder syntaktisch unterschieden werden.

3.1.1 Wortartenbezogene Unterscheidung

Eine wortartenbezogene Unterscheidung von Metaphern der Live-Sportberichterstattung führt zu einer Einteilung in Verbmetaphern, Adjektiv- bzw. Partizipialadjektivmetaphern sowie Substantivmetaphern. Letztere erscheinen als einfache Substantive oder als Substantivkomposita, die entweder vollmetaphorisch oder teilmetaphorisch sind. Bei den Substantivkomposita eröffnet die Struktur ein besonderes Potenzial, denn „im Deutschen bietet das substantivische Kompositum die Möglichkeit der Verbindung von Herkunfts- und Zielbereich in einem Wort“ (Kohl 2007: 46 f.). Ein Beispiel dafür wäre das *Jokertor* im Fußball, das ein durch einen eingewechselten Spieler – einen *Joker* – erzieltes, spielwichtiges Tor meint. Beim Kartenspiel als dem Herkunftsbereich des *Jokers* wird diese Karte eingesetzt, wenn das Spiel ansonsten für den Spieler schwer weiterzuspielen wäre; er erhält dadurch eine neue Spiel(gewinn)chance. In ähnlicher Funktion wirkt der Joker-Spieler beim Fußball, denn wenn ein Spiel stockt und ein Tor dringend für einen guten Spielverlauf benötigt wird, greift ein Trainer oft zum Mittel des Auswechselns. Indem der neu eingewechselte Spieler trifft und das wichtige *Jokertor* erzielt, hat der Trainer sich als guter Spieler bewiesen, denn er hat die richtige Person zum Einwechseln ausgewählt, also ‚auf die richtige Karte gesetzt‘ und ‚ein gutes Händchen bewiesen‘, und hat durch das Einwechseln dem Spiel die gewünschte Richtung gegeben.

Folgende Strukturtypen von Metaphern zeigen sich im Material, wobei sich *Verwendung* hier auf die rezipierten Fernsehberichterstattungen bezieht (nicht auf eine generelle Aussage zu Verbreitung und Häufigkeit):

Wortart		**Sprachbelege**	**Verwendung** (Sportart; Frequenz)
Substantiv			
einfach		*Da haben sie ein **Juwel**.* (‚X ist wertvoll, siegreich')	alle Sportarten; häufig
		*den Ball in die **Gasse** spielen* (‚den Ball auf einer schmalen, vom Gegner freien Bahn spielen')	Fußball, Handball; häufig
		*das **Scharnier** spielen* (‚ein Spieler, der die Bälle verteilt und die Lücken schließt')	Fußball; selten
		*die **Kugel** nicht treffen* (‚den Ball nicht treffen')	Fußball; häufig
		*sein/ihr erster **Auftritt*** (‚erster Wettkampfeinsatz')	alle Sportarten; häufig
		*im **Tunnel** sein* (‚sich nur auf sich selbst konzentrieren und die Umgebung ausblenden')	alle Sportarten; häufig
		*sein **Ticket*** lösen (‚die Qualifikation für eine Meisterschaft schaffen')	alle Sportarten; häufig
Kompositum	voll-metaphorisch	***Rohdiamant*** (‚X ist ein großes, entwicklungsfähiges, perspektivreiches Talent')	alle Sportarten; häufig
		*Sie ist eine **Blaupause** von Kerber.* (‚Sie spielt so, wie sonst Kerber spielt.')	Tennis; einmalig (13.8.16)
		Langholz (‚weite Pässe möglichst über das gesamte Spielfeld')	Fußball; selten
		Schaltzentrale (‚für das Spiel und die Taktik wesentlicher Spieler')	Fußball; häufig Handball; selten
	teil-metaphorisch	*Fan**kolonie*** (‚Gruppen von Fans an Wettkampfstätten')	alle Sportarten; häufig
		*Trainer**fuchs*** (‚erfahrener, cleverer Trainer')	alle Sportarten; häufig
		***Joker**tor* (‚wichtiges, durch einen Einwechselspieler erzieltes Tor')	Fußball; häufig
		*Ball**magnet*** (‚Spieler, der oft den Ball hat')	Fußball, Handball; selten
		[*kein*] *Kopfball**ungeheuer*** (‚[kein] guter Kopfballspieler')	Fußball; häufig
		*Zweikampf**monster/-ungeheuer*** (‚harter, kämpferischer Gegenspieler')	Fußball; selten
		*Tor**jäger*** (‚Spieler, der viele Tore erzielt')	Fußball; häufig

		***Modell**athlet* (‚physisch makelloser Sportler')	kraft- und ausdauerbetonte Sportarten; häufig
		***Königs**disziplin* (‚prestigeträchtigste Disziplin einer Sportart')	Sportarten mit mehreren Disziplinen oder (Gewichts)klassen; häufig
Verb			
		den Ball ***durchstecken*** (‚den Ball zwischen den Gegnern hindurchspielen')	Handball, Fußball; häufig
		mit 3:0 aus der Halle ***gefegt*** (‚mit 3:0 besiegt')	Volleyball; einmalig (18.8.16)
		Der Ball bleibt an der Netzkante ***kleben****.* (‚Ball verfängt sich oben im Netz')	Tennis; häufig
		viele Meter/X Kilometer ***abspulen*** (‚viel laufen')	Fußball; häufig
		das Tor ***zunageln*** (‚das Tor durch den Torhüter oder die Abwehr versperren')	Handball, Fußball; häufig
		den Gegner ***zustellen*** (‚den Gegner eng decken')	Fußball; häufig Handball; selten
		*im Strafraum (****lichterloh****)* ***brennen*** (‚Gefahr eines Gegentores')	Fußball; häufig
		es ***nach Hause bringen*** (‚einen Wettkampf gewinnen')	alle Sportarten; häufig
Adjektiv			
einfach		*das Spiel* ***breit*** *und* ***tief*** *machen* (‚große Räume für die Zuspiele schaffen')	Fußball; häufig
		blank *stehen* (‚nicht durch einen Gegenspieler gedeckt werden')	Fußball, Handball; häufig
		[*nicht mehr*] ***rund*** *laufen* (‚humpeln/noch unbeeinträchtigt laufen')	Fußball, Handball; häufig
Partizipialadjektiv		***schwimmender*** *Neuner* (‚die Position der Neun etwas flexibler spielen')	Fußball; selten
		hängende *Spitze* (‚etwas zurückgezogener Stürmer')	Fußball; häufig
		fliegender *Wechsel* (‚schneller Austausch eines Spielers bzw. schnelle Veränderung eines Dressurelements')	Handball, Pferdesport; häufig

3.1.2 Syntaktische Unterscheidung

Neben einer Einteilung von Strukturtypen nach Wortarten könnten die Metaphern auch syntaktisch unterschieden werden. Die zwei am häufigsten beobachteten syntaktischen Muster waren Prädikationsmetaphern und satzwertige Metaphern. Durch die prädikativen Metaphern kann eine direkte Zuweisung erfolgen, d. h., der Übertragungsvorgang vom Herkunfts- in den Zielbereich ist unmittelbar. Eine bei den Wettkämpfen in allen Sportarten häufig verwendete Prädikationsmetapher war *X* ***ist ein Krimi***. Einmalig dagegen war die Verwendung der prädikativen Metapher *Niclas Süle* ***ist ein so großes Versprechen*** *auch für die A-Nationalmannschaft in Zukunft* am 20.8.16 beim olympischen Fußballfinale. Solche einmalige Verwendung kann auch dergestalt erfolgen, dass der Bildbereich der prädikativen Metapher im Folgeteil ausgebaut wird, wie es exemplarisch der Kommentar zur Entscheidung im olympischen Dressurreiten am 12.8.16 zeigt: *Isabell Werth* ***ist eine so hell strahlende Kerze*** *inmitten der* ***Kathedrale*** *des Dressursports.* Eine mittlere Häufigkeit und zudem eine Beschränkung auf Ballsportarten hat die prädikative Metapher: *Der Spielaufbau/die Abwehr/der Aufschlag* ***ist eine Katastrophe***. Das bedeutet, dass prädikative Metaphern prinzipiell zwar oft genutzt werden, aber die konkreten Metaphern variieren in ihrer Anwendungshäufigkeit von hochfrequent (und damit schon fast fester Bestandteil des sprachlichen Inventars eines Reporters) über sportartenspezifisch frequent bis hin zu einmalig durch einen Reporter zur Kommentierung verwendet.

Die satzwertigen Metaphern zeigen dagegen eine stärkere Bindung an die Kommentierung eines konkreten Ereignisses und an den jeweiligen Reporter; sie treten in dieser Form meistens nur einmalig auf und werden des Öfteren innerhalb des Satzes mit weiteren Elementen aus diesem Bildbereich verknüpft (Beispiele f–h). Beispiele für satzwertige Metaphern, die vom Kommentator einmalig für das Berichten des aktuellen Geschehens genutzt wurden, sind:

a) *Sie ist eine erfahrene Kämpferin – sie hat in jeder Disko schon getanzt.* (Judo; 6.8.16)
b) *Lars Bender geht auf der letzten Rille mit.* (Fußball; 7.8.16)
c) *Am 5. Tag endlich die erste Medaille für den deutschen Judobund – die Kuh ist jetzt vom Eis.* (Judo; 10.8.16)
d) *Er hat sich mit 3 Toren ins olympische Schaufenster gestellt.* (Fußball; 7.8.16)
e) *Der Sand färbt sich langsam golden für die deutsche Mannschaft.* (Pferdesport; 12.8.16)
f) *Auf was für eine Achterbahnfahrt nimmt Angelique Kerber uns wieder mit? … Angelique Kerber hat uns auf eine Reise mitgenommen, die spannender und abenteuerlicher nicht hätte sein können.* (Tennis; 13.8.16)
g) *Die Tschechen haben wie ein Boxer in den Seilen gehangen, aber die Spanier konnten den K.O.-Schlag nicht setzen.* (Fußball; 13.6.16)
h) *Es ist Sisyphusarbeit – kaum haben die Engländer den Stein hochgerollt, stoßen ihn die Isländer wieder runter.* (Fußball; 27.6.16)

3.2 Kategoriale Unterscheidung

Eine Bündelung von strukturellen und kategorialen Betrachtungen könnte schematisch in folgende Übersicht gefasst werden, wobei unberücksichtigt bleibt, dass auch Phraseme, Vergleiche und fachsprachliche Ausdrücke ihrerseits aus morpho-syntaktischer Perspektive betrachtet werden können. Vielmehr versucht die Übersicht bei einer Trennung der Kategorien

sprachlicher Elemente anzusetzen, nämlich Metapher, Phrasem, Vergleich, Fach(jargon)ausdruck, sodass die morpho-syntaktische Struktur ein sekundäres Merkmal auf zweiter Ebene wird, das nur hinsichtlich der Kategorie Metapher i. e.S. (also *nicht* eine Metapher in Form von Phrasem, Vergleich oder Fachausdruck) genauer aufgeschlüsselt wird (vgl. 3.1):

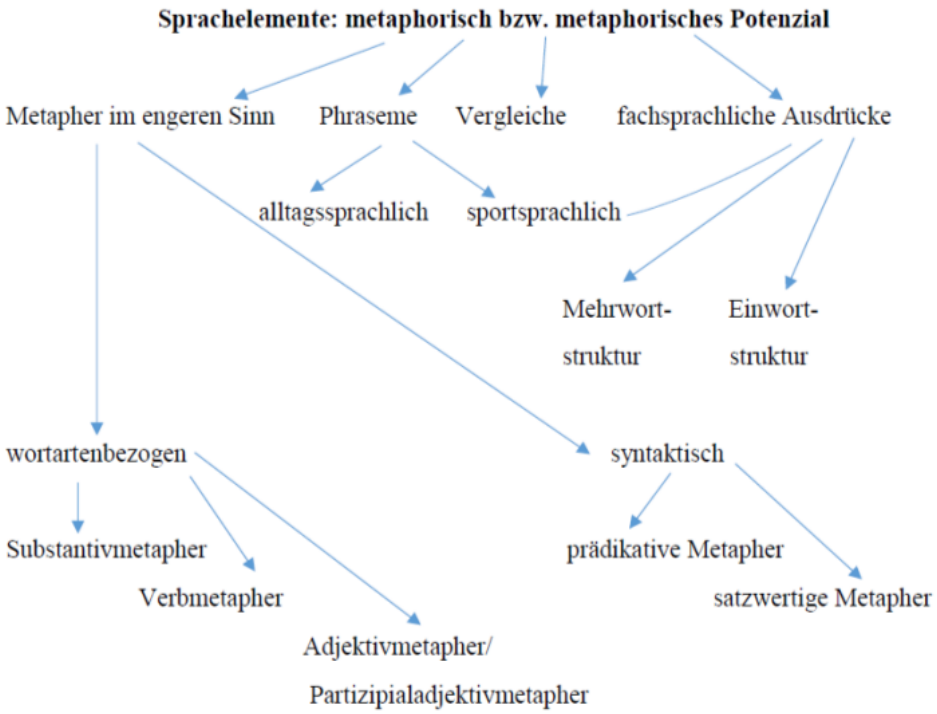

Abbildung 1: Kategorien metaphorischer Sprachelemente

Die metaphorischen Sprachmuster können außer nach Wortarten und syntaktischer Struktur auch nach Kategorien sprachlicher Mittel (vgl. 2.2) eingeteilt werden. Fasst man die in 3.1 aufgeführten Sprachbelege als Metaphern im engeren Sinne, kann man zu den potenziell metapherfähigen weiteren Kategorien die Vergleiche, die fachspezifischen Ausdrücke in Ein- und Mehrwortform (als Mehrwortkombination entwickeln sie den Charakter von sportfachsprachlichen Phrasemen) sowie die allgemeinsprachlichen und sportsprachlichen Phraseme zählen, die z. T. aber auch zu den Termini bzw. zum Fachjargon gehören.

Da Phraseme mehrgliedrige, strukturfeste Wortverbindungen sind, die als Einheiten abrufbar im mentalen Lexikon gespeichert sind, handelt es sich bei den in der Sportberichterstattung verwendeten Phrasemen nicht um Einmalprägungen (das wäre nur in einem ganz spezifischen Fall denkbar, der den Autorphrasemen in der Literatur gleichen müsste, d. h., ein Reporter müsste während der Berichterstattung eine Wortverbindung prägen und permanent wiederverwenden, sodass diese Wendung zu einer für die konkrete Live-Übertragung festen, wiederkehrenden Wendung wird). Damit können die metaphorisch verwendeten alltagssprachlichen und sportsprachlichen Phraseme als lexikalisierte Metaphern gelten, wobei in Abhängigkeit vom Bekanntheitsgrad – gerade bei den sportsprachlichen Phrasemen – die

phraseologische Metapher für den einzelnen Nutzer noch einmal unterschiedlich stark konventionalisiert erscheinen kann:

> Die wichtigste Unterscheidung nach Typen der Metapher betrifft den Konventionalitätsgrad …]. Am Ende des Spektrums ist die konventionelle, fest im Wortschatz etablierte und somit ‚lexikalisierte' Metapher, die als solche nicht wahrgenommen wird und insofern als ‚tot' gilt. Am anderen Ende des Spektrums befindet sich die besonders für die Dichtung charakteristische kreative, innovative Metapher, die durch ihre Frische ‚lebendig' wirkt und aufgrund ihrer Ungewöhnlichkeit als besonders ‚kühn' angesehen wird. (Kohl 2007: 20)

Treten Phraseme als Metaphern auf, müssen es aufgrund der Lexikalisierung phraseologischer Einheiten konventionalisierte Metaphern sein. Bei den sportsprachlichen Phrasemen kann der Laienzuschauer dabei den Eindruck von kreativen Metaphern haben, wenn ihm die Verwendungshäufigkeit der festen Wortverbindung und damit der phraseologische Charakter nicht bewusst sind. Für den Expertenzuschauer und den Fachkommentator dagegen sollten metaphorische sportsprachliche Phraseme konventionelle Metaphern darstellen. Für einen Reporter gehören die in Sportberichterstattungen regelmäßig verwendeten und dadurch als fachliches Beschreibungsmedium etablierten festen sportsprachlichen Wortverbindungen sogar zur sprachlichen Basis und Grundausstattung bei der Kommentierung in der Live-Übertragung. Sind die sportsprachlichen Phraseme metaphorisch, greift ein Kommentator folglich automatisch auf vorgefertigte, strukturfeste Metaphern zurück, wenn er das Sportereignis fachgerecht kommentiert. Hierin liegt die Verbindung zwischen sportsprachlichen Phrasemen und mehrwortigen Fach(jargon)ausdrücken in Bezug auf die Metaphorik. Als Beispiele für metaphorische sportsprachliche Phraseme und damit für mehrwortige Fachausdrücke sollen feste Wendungen aus dem Fußball dienen:

- *Beton anrühren* (‚sich komplett in die Verteidigung zurückziehen');
- *den Ball abtropfen lassen* (‚den Ball sanft vom Körper abprallen lassen');
- *Zeit von der Uhr nehmen* (‚das Spiel bei Unterbrechungen verzögern');
- *vor dem K.o. stehen* (‚in Achtel-, Viertel-, Halbfinale zu verlieren drohen');
- *sich vom Gegenspieler abkochen lassen* (‚sich austricksen lassen');
- *den Gegenspieler/Torwart tunneln* (‚den Ball durch die Beine des Gegenspielers/gegnerischen Torwarts spielen');
- *hinter den Ball gehen* (‚die eigenen Spieler so zurückziehen, dass sie den gegnerischen Angriff abwehren können');
- *den Torwart ausgucken* (‚den gegnerischen Torwart überlisten');
- *die Räume zulaufen* (‚Lücken schließen, die der Gegner zum Torangriff nutzen könnte').

Metaphorische Fach(jargon)ausdrücke erscheinen jedoch nicht nur in der Kombination mehrerer Wörter als Phrasem, sondern auch in Einwortstruktur, wie z. B. *einnetzen* (‚den Ball in Hand-, Fuß-, Basketball ins Tor/in den Korb bringen'), *Schwalbe* (‚Fußballspieler täuscht vor, gefoult worden zu sein und lässt sich im Flug auf den Boden fallen'), *Elf* (‚Bezeichnung für eine Fußballmannschaft, die regulär aus 11 Spielern besteht'), *Flaggschiff* (‚Bezeichnung für den deutschen Ruder-Achter der Männer, der das Vorzeigeboot und Prestigeobjekt des deutschen Ruderverbands ist'); *Dreier-/Viererkette* (‚spezielle Abwehrformation beim Fußball'); *X-Mann-Mauer* (‚Abwehrformation bei Freistößen im Fußball').

Bei den alltagssprachlichen Phrasemen, die in der Ganzreportage metaphorisch zur Kommentierung des Geschehens verwendet werden, handelt es sich um lexikalisierte und auch dem Laienzuschauer meistens bekannte Metaphern, wie z. B. *der Akku ist leer/runter/geht aus*; *den Deckel draufmachen*/*den Sack zubinden*; *die Fäden* [im Mittelfeld, in der Abwehr] *ziehen*; *auf Augenhöhe agieren; jmdm. in die Karten spielen*; *mit einem blauen Auge davonkommen*.

Ebenso wie Phraseme und Fach(jargon)ausdrücke können auch Vergleiche metaphorisches Potenzial entwickeln, sodass Bildlichkeit mithilfe des sprachlichen Vergleichs erzeugt werden kann. Dies wurde beispielsweise in der Tennis- und Fußballberichterstattung genutzt:

a) *Kerber steht wie eine Wand.* (Tennis; 13.8.16)
b) *Sie trifft immer wieder die Linie wie ein Schlagroboter*. (Tennis; 13.8.16)
c) *Ein Schweizer Käse ist wie eine Betonwand im Vergleich zu dieser deutschen Abwehr*. (Fußball; 6.8.16)

Beim Beispiel c) erfolgt sogar ein doppelter Vergleich (‚Die Abwehr ist löchrig wie ein Schweizer Käse, der wiederum gegen diese Abwehr wie eine lückenlose Betonwand wirkt'), der zudem auch metasprachlich (‚im Vergleich zu') signalisiert wird. Üblicher ist allerdings der einfache Vergleich mit *wie*. Auch innerhalb eines Kompositums kann ein Vergleich ausgedrückt werden, wie z. B. durch *butterweich* bei einem Kommentar zum Pferd Desperados bei seinem Element „Passage" aus dem Dressurreiten bei Olympia (12.8.16): *Butterweich fließt Desperados in die Passage.*

4 Schlussbetrachtung – zurück zu *Rohdiamanten* und *Modellathleten*

Sieht man *Rohdiamanten, Modellathleten* und *Juwelen* in der Live-Sportberichterstattung unter metaphorischem Aspekt, zeigt sich hier eine wesentliche Eigenschaft von Metaphern, nämlich die Fokussierung:

> Metaphern liefern nur eine *partielle* Beschreibung des jeweiligen Zielbereichs, die bestimmte Aspekte hervorhebt und andere ausblendet. Hinsichtlich dieser *Fokussierung* unterscheiden sich alternative Metaphern für denselben Zielbereich. (Jäkel 2003: 41; Hervorhebungen im Original)

Die drei Metaphern *Rohdiamanten, Modellathleten* und *Juwelen* werden in vielen Sportarten verwendet und bezeichnen einen mit besten Voraussetzungen ausgestatteten Siegertyp. Die Perspektive allerdings ist etwas unterschiedlich: Während *Rohdiamant* ein noch auszuformendes, in Zukunft siegreiches sportliches Talent meint, verbirgt sich hinter *Juwel* ein bereits fertig entwickelter Siegertyp im Sport; *Modellathlet* dagegen betont das ideale körperliche Muster und die hervorragende physische Qualität eines Siegers. Solcherart konzeptuelle Betrachtungen von Metaphorik ließen sich im Kommunikationsbereich der Live-Sportberichterstattung ebenso anstellen wie die für die Studie ausgewählten strukturellen und kategorialen Beschreibungen. Alle drei Aspekte – spezifische Konzeptualisierungen und die Bildverhältnisse zwischen Herkunfts- und Zielbereich, spezifische Struktur- und Bildungsmuster (vgl. 3.1), spezifische Ausprägungen von Kategorien sprachlicher Elemente (vgl. 3.2) – kennzeichnen Besonderheiten des Sprachmittels *Metapher* bei seiner Verwendung in Live-Sportberichten. Dabei stellt das Medium der Berichterstattung, nämlich das Fernsehen, einen wichtigen Faktor für die Ausprägung der sprachlichen Mittel dar, da es eine besondere Konstellation in der kommunikativen Rahmung des Berichtens schafft. Trotzdem werden auch bei dieser speziel-

len Kommunikationssituation die den gesamten Kommunikationsbereich des Sports überdachenden Eigenschaften und Funktionen typischer sprachlicher Mittel gewahrt. Eines davon ist die Metapher und sie dient in der Live-Sportberichterstattung

- dem Festhalten des Eindrucks von der Situation sowie der bildlichen Versprachlichung des im Fernsehen laufenden Geschehens durch die Übertragung vorhandener sprachlicher Elemente auf einen neuen Zielbereich,
- der Veranschaulichung und somit der Stimulierung der Imagination,
- der Ästhetisierung, z. B. auch in Form eines individualisierten, originellen und aufmerksamkeitserzeugenden Stils des Kommentators,
- der Emotionalisierung und Unmittelbarkeit in der Wahrnehmung des kommentierten Geschehens,
- der Pointierung, Nuancierung und Fokussierung der Sprecheraussagen.

Somit erweisen sich Metaphern als ein funktional bedeutsames Sprach- und Stilmittel in der Live-Sportberichterstattung im Fernsehen.

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Translation Students' Difficulties with English and Arabic Color-based Metaphorical Expressions

Reima Al-Jarf

Abstract This study aims to identify the similarities and differences between English and Arabic color-based metaphorical expressions, to identify translation students' difficulties and their translation strategies. A corpus of English and Arabic color-based metaphorical expressions was collected and compared. It was found that English and Arabic color-based metaphorical expressions fall into five categories: (i) those that are identical in form and meaning in both languages; (ii) those that are the same in meaning but differ in form, (iii) those that are identical in form but different in meaning; (iv) those that exist in English but have no equivalents in Arabic; and (v) those that exist in Arabic but have no equivalents in English. Students' responses to a color-metaphor test showed that the students translated fewer than 25 % correctly and left many items blank. Color-based metaphorical expressions similar in both languages were easy to translate such as *black list, red line, green light,* whereas opaque ones were difficult. Literal translation was the most common translation strategy. Implications for translation pedagogy are given.

Keywords English color metaphors, Arabic color metaphors, translation students, metaphor translation difficulties, metaphor translation strategies, metaphor meaning transfer

1 Introduction

A color metaphor is a figure of speech that contains a color word such as *black, white, red, blue, green, yellow, orange, pink, silver* or *golden* and refers to one thing by mentioning a color, used for rhetorical effect. Color-based metaphorical expressions are common in all languages. For example, *black and white* used in English, is أسود وأبيض in Arabic, *blanco y negro* in Spanish, and *preto e branco* in Portuguese. Some metaphors are limited to some colors but not others. For example, *brown* has no metaphorical use in Arabic.

Being a sub-category of metaphors, color-based metaphors are widely used literally and metaphorically in different language genres and may also reflect cultural features of the language users (cf. Lan/MacGregor 2009, Rasekh/Ghafel 2011). Color metaphors may convey different connotative interpretations based on the beliefs, norms and constraints of the users' culture (cf. Mohamadi 2015). Some of the color-based metaphorical expressions in English and Arabic have both a literal and figurative/idiomatic meaning as in *red line, white flag, green light, black box, blue line, red carpet*; others have an idiomatic meaning only as in *black market, blue-blooded*, and الأبيضان ('the two whites', i. e., 'salt and sugar' or 'milk and water'), الأخضران ('the two greens, i. e., 'grass and trees') in Arabic. Some of the color-based metaphorical expressions have a single meaning as in *red line, blue collar, blueprint, black gold, yellow fever, black belt, red-light district* in English; others have multiple meanings as in شاب أخضر ('green

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person', i. e., 'young and inexperienced'), وجهه أصفر ('yellow faced', i. e., 'pale of fear or sickness'), الماء الأزرق ('blue water') in Arabic. Examples of color-based metaphorical expressions that are culture specific are *red light district, blue-blooded,* in English; and الأسودان ('the two blacks', i. e., 'the snake and the scorpion', or 'water and dates'), سوّد وجه أبيه ('to blacken his father's face', i. e., 'do something embarrassing'), والیابس الأخضر ('green and dry grass', i. e., 'destroy everything'), الرايات السود ('black banners', i. e., ISIS), اِسْوِدادُ وَجْهِهِ ('his face was blackened', i. e., 'embarrassed'), الحَجَرَ الأَسْوَدَ، ('Black Stone in Kaaba', i. e., 'a holy stone'), and العين الحمراء ('show the red eye', i. e., 'be strict') in Arabic.

Since Arabic is a diglossic language, i. e., has a standard form and a non-standard colloquial form, with different dialects used across and within Arab countries, color-based metaphorical expressions are common in both Standard and colloquial Arabic. For example يا نهار أبيض، ('what a bright day', i. e., 'good news that brightens one's day'), يا ويله يا سواد ليله ('his nights will be black', i. e., 'will have bad consequences') are colloquial; whereas ليالي حمراء، ('red nights', i. e., 'full of drinking and dancing'), السوق السوداء ('black market'), السجادة الحمراء ('red carpet'), الضوء الأخضر ('green light'), كذبة بيضاء ('white lie'), منطقة رمادية ('grey area'), العصر الذهبي ('golden age') are standard as well as colloquial as both overlap in some cases.

Interestingly, color-based metaphorical expressions in Arabic are not only used in general, common language, but they are also used in different domains as in the following table:

Table 1: Color metaphor domains with Arabic examples and their English meanings

Domains	**Arabic examples and their English meanings**	
Art and literature	رمادية الحرف	grey letters grey alphabet i. e. gloomy words
	رمادية المشاعر	grey feelings i. e. sad
	أدب رمادي	grey literature
	أحلام البنفسج	violet dreams
	دموع برتقالية	orange tears
	سيمفونية برتقالية	orange symphony
	بياض الثلج	as white as snow, i. e., Snow White
	الاقلام الصفراء	yellow pens i. e. cynical authors
Business banking and economics	عميل ماسي	platinum client
	بطاقة ذهبية	gold card
	الطبعة الزرقاء	blue print
	الذهب الأسود	black gold
	السوق السوداء	black market
	الياقات الزرقاء	blue collars
	السجل الأخضر	green record

Religion	الدخان الأبيض	white smoke
	الخيط الأبيض والخيط الأسود	white thread and black thread i. e. the line that separates darkness and dawn
	الرايات السود	black banners
	حمر النعم	red camels i. e. camels of good breed
	تبيضّ وجوه	faces turning white i. e., honored
	وتسودّ وجوه	faces turning black i. e., embarrassed
	الأسود والأحمر	the black and the red i. e. black people and blonde people
History	بنو الاصفر	yellow race i. e. the Chinese
	الهنود الحمر	Red Indians
	الرجل الأبيض	White man
	العصر الذهبي	golden age
Law	سجل أسود	black record
	نقطة سوداء	black dot
	القائمة السوداء	black list
Medicine	الذئبة الحمراء	red wolf i. e., lupus erythematosus
	الماء الأزرق	blue water i. e., glaucoma
	الماء الأبيض	white water i. e., cataract
	الحمى الصفراء	yellow fever
Politics military and media	ثورة برتقالية	orange revolution in Ukraine
	الجيش الأحمر	Red Army
	الراية البيضاء	white flag i. e. surrender
	عملية بيضاء	white operation i. e. nobody was killed
	البراميل الزرقاء	blue barrels
	الارهاب الأسود	black terrorism
Zoology	الحوت الأزرق	blue whale
	حصان أزر	blue horse
Sports and others	الحزام الأسود	black belt
	ميدالية برونزية	bronze medal

Interpreting and translating color-based metaphorical expressions involve knowledge of their literal and figurative meanings. Cultural metaphors require an understanding of the input domains and their properties or connections with the output domains. The amount of knowledge that language users have about the relationship between color symbols in language and culture allows that the 'right' reading be activated in different contexts (Plaza 2015).

2 Literature review

Metaphors have received considerable attention in linguistics, pragmatics and translation studies, especially translatability and transfer procedures. A review of the literature has shown several lines of research that investigated metaphors, in general, and color-based metaphorical expressions, in particular. One group of studies focused on different types of color-based metaphors. For example, Ghafela/Mirzaie (2014) investigated the underlying conceptual meaning

involved in the construction of Persian color-based metaphors of emotion and body parts, and the interplay of linguistic expressions and cultural knowledge. Another study by Wijana (2015) classified color metaphors in Indonesian into chromatic and achromatic and compared them with English. Indonesian color metaphors were found to correlate with extra linguistic factors such as politics, religion, history, the environment, and other socio-cultural aspects. No significant differences were found in the metaphorical uses of achromatic colors in English and Indonesian. Furthermore, Al-Adaileh (2012) classified the connotations of Arabic phrases, in which the color terms *black, white, yellow, red, green,* and *blue* occurred into: orthophemistic, euphemistic, or dysphemistic. The researcher found that colors have many orthophemistic connotations. Dysphemistic connotations were found to be more common than euphemistic connotations. The uses of *black, yellow, red* and *blue* were predominantly dysphemistic; *white* mostly had positive connotations, whereas *green* was associated with both euphemistic and dysphemistic connotations.

A second group of studies explored color-based metaphorical conceptualizations in a single language. In a study on the metaphorical conceptualizations of the colors *black* and *white* in the British National Corpus (BNC) and Corpus de Referencia del Español Actual (CREA), Plaza (2015) found that the use of *black/negro* as 'bad, unhappy' and *white/blanco* as 'good, innocent' represent cultural realities. She concluded that both English and Spanish *black* and *white* collocations, idioms and proverbs are powerful symbols in culture. Similarly, Chinese people are fond of *hong se*, i. e., 'red color', and use it in expressions such as *red flag, red clothes, red lantern, red couplet*. They consider it the "national color" of China and call China "Red China". The word *red* in metaphors in Chinese has special associations, symbols, implied meanings, and usages. Chinese culture, customs, value-concept and way of thinking are reflected in red-color metaphors (cf. Qiang 2011). In addition, Persian proverbs and poems with color terms have their metaphorical reflections in the users' beliefs, ideas, or values. Colors are not distributed equally in Persian proverbs, and color-based metaphors in proverbs and poem share both positive and negative connotations (cf. Aliakbari 2013, Aliakbari/Khosravian 2015). In Arabic poetry, the emotive metaphorical conceptualizations of happiness and sadness reveal many cultural similarities and differences with English (cf. Elseddig et al. 2016).

A third group of studies compared color-based metaphors in two or three languages. Philip (2006) compared the connotative meanings of color-word metaphors in English and Italian, how those meanings are fixed linguistically, and the similarities and differences across the two languages. In English and Chinese, the similarities in color metaphors are attributed to the common perceptual and cultural experience, whereas the differences originated from the different living environment, religion, customs, and philosophy (cf. He 2011). In English and Persian, the connotation of colors in the structure of metaphorical expressions are somewhat overlapping and most of the metaphorical expressions are culture-bound and specific to each language (cf. Rasekh/Ghafel 2011). Moreover, color metaphors in English and Turkish proverbs have similar connotative meanings in the case of *white* and *black*, but negative and positive connotations in the case of *red, green, yellow* and *blue* as those depend on the cultural background and context in which the proverbs are used (cf. Mohamadi 2015).

In a comparative study of eight color terms in business English in two specialized corpora: The Hong Kong finance corpus (HK-F) and the financial texts from the British National Corpus (BNC-F), each containing about seven million words, Lan/MacGregor (2009) indicated that all eight colors *black, white, green, red, yellow, blue, brown* and *grey* were used literally and metaphorically in both corpora with quantitative and qualitative differences. Overall, color

words appeared more frequently in the British than in the Hong Kong corpus with the exception of *yellow*, but more often as metaphors in the HK-F with the exception of *red*. The ratios of literal to metaphoric use of color terms revealed large variation between colors and corpora. The researchers gave cultural reasons for the differences in usage between the two corpora. Across both corpora, metaphorical expressions incorporating *black* have negative connotations, *white* metaphors have positive connotations, whereas other colors showed an equal mix of positive and negative connotations.

A fourth group of studies examined how metaphors, in general, and color metaphors, in particular, are translated from one language to another. In this respect, Abdullah/Shuttleworth (2013) investigated the challenges faced in translating metaphors in technical texts from English to Malay. The metaphors in the source text (ST) and target text (TT) were classified according to Newmark's (1988) categories: (i) dead metaphor; (ii) cliché metaphor; (iii) stock/standard metaphor; (iv) adapted metaphor; (v) recent metaphor; and (vi) original metaphor. Although metaphors were used in both ST and TT, the percentage and frequency of use differed from one to another. There were 30 metaphors in the ST compared to 11 in the TT. When the 19 metaphors in the ST were translated, they were either deleted from TT or no longer existed as metaphors. The majority of metaphors in the ST and TT were stock metaphors. In translating the 11 metaphors that appeared in both the ST and TT, the metaphor type changed from one type in the ST to another in the TT. The translation strategies used were deletion in the case of untranslatable metaphors, substitution of a metaphor by a different metaphor, or use of an exact equivalent.

Another study by Gholami et al. (2016) examined how 65 metaphors selected from a book with 54 supplications titled *AlSahifah Al-Sajjadiyah* were translated from Arabic into English by Chittick (2008) and Muhani (1984). English translations were compared with the Arabic ST using the Jakobson/Halle's (1956) syntagmatic and paradigmatic axes. On the syntagmatic axis, i. e., the axis of combination, words are linked or chained together according to grammatical rules, but the researchers made choices about which words to link together on the paradigmatic axis, i. e., the axis of selection. The researchers concluded that Chittick translated the metaphors as literally and faithfully as possible. He observed both the syntagmatic and paradigmatic axes in his translation more than Muhani, and thus approximated the original text's literary style. On the other hand, Muhani mostly converted the metaphors to their senses, and paid more attention to meaning and content than linguistic form.

Similarly, Shabani (2008) compared the English translation of 33 color metaphors extracted from the *Shahnameh* of Ferdowsi by Warner/Warner (1925) and Davis (2007). The analysis was based on Newmark's (1988) seven procedures for translating metaphors: (P1) reproducing the same image in the TL; (P2) replacing the image in the SL with a standard TL image which does not clash with the TL culture; (P3) translating the metaphor by a simile, retaining the image; (P4) translating the metaphor or simile by a simile plus sense, or a metaphor plus sense; (P5) converting the metaphor to sense; (P6) deleting the metaphor if it is redundant or serves no practical purpose; and (P7) translating the metaphor by the same metaphor combined with sense. The researcher found that Warner and Warner applied five procedures in translating color metaphors in *Shahnameh*, whereas Davis applied all seven procedures. Warner and Warner applied Newmark's P1 in 70 % of the color metaphors. Deletion and translation of metaphor by simile plus sense were not applied at all. By contrast, 36 % of the color metaphors in Davis' translation were translated via P1, and 64 % via the remaining six procedures. Warner and Warner's tendency to use the first procedure resulted in a literal translation of a particular

metaphor, whereas Davis had a tendency towards using the other six procedures which led to simplification, explicitation, and production of a reader-oriented text.

To summarize, the prior studies reported above investigated color-based metaphors in several languages: Arabic, English, Chinese, Spanish, Italian and Persian. They utilized different approaches in analyzing the data, the metaphor type and translation strategies used. They focused on examining the connotative meaning of color metaphors, cultural issues that affect the interpretation of color metaphors, the challenges that they pose for translators, and the different translation approaches used. However, prior studies that investigated the translation of color-based metaphors per se are limited. There is a lack of studies that investigated the difficulties that translation students have in translating general-type color-based metaphors. Therefore, the present study aims to fill a gap in this area. It aims to examine English and Arabic color-based metaphorical expressions, to identify the similarities and differences between them, to investigate translation students' ability to comprehend and translate color-based metaphorical expressions from English to Arabic and vice versa, and to identify the strategies that they use in translating them. In other words, the present study aims to answer the following questions: (i) What are the similarities and differences between English and Arabic color-based metaphorical expressions? (ii) Which types of color-based metaphorical expressions are easy to translate, and which ones are difficult to translate by translation students at the College of Languages and Translation (COLT)? (iii) Which strategies do student translators at COLT use in translating color-based metaphorical expressions from English to Arabic and vice versa?

Since color-based metaphorical expressions are an inseparable feature of technical and non-technical discourse, language users, in general, and translation students, in particular, are advised to familiarize themselves with color-based metaphorical expressions in different domains, especially because translation students at COLT take 18 specialized translation courses in: humanities, education, sociology, literature, politics, media, medicine, natural sciences, Islamic studies and others, and knowledge of the similarities and differences between English and Arabic color-based metaphorical expressions is crucial in meaning transfer.

Metaphors can pose translation problems, since transferring their meaning from one language and one culture to another may be hindered by linguistic and cultural differences (Schäffner 2004). Because the color systems of Arabic and English are not connotationally identical, this study reports on the connotations of Arabic color-based metaphorical expressions as an under-researched area of Arabic pragmatics. The cultural connotations carried by color-based metaphorical expressions in Arabic are quite profound and abstruse. Understanding the similarities and differences of color metaphors between English and Arabic is of great importance in cross-cultural communication. This also helps teachers, students and translators in teaching, translation, and appreciation of culture. As university lecturers use metaphors for important functions such as explaining and evaluating, EFL and translation students may be missing valuable learning opportunities. The color-metaphor translation error categorization scheme in this study could be used in helping learners of English and student translators comprehend color metaphors.

3 Subjects

A total of 115 translation students at the College of Languages and Translation (COLT), King Saud University, Riyadh, Saudi Arabia participated in the study. Students in semester 6 (60 students) constituted the beginners' group, those in semester 9 (55 students) constituted the

advanced group. The subjects in both groups completed four levels of English language courses: 4 listening, speaking, reading and writing courses, 3 grammar and 2 vocabulary courses, in addition to several Arabic language courses: syntax, morphology and rhetoric. They took linguistics (2 hours), semantics (3 hours), text linguistics (2 hours), 3 interpreting courses (6 hours), and 2 specialized translation courses in physical sciences and the humanities (2 hours each). In addition, students in level 9 completed 12 specialized translation courses in medicine, engineering, military, Islamic studies, media, administration, sociology, education, security, commerce, politics, and computer science (2 hours each).

As for color-based metaphorical expressions, students in both groups did not study color-based metaphorical expressions per se, rather they studied a sample of English idioms and metaphors in the vocabulary courses that they took.

4 Methodology

4.1 Collecting the color-metaphor data

A corpus of 195 English and 278 Arabic color-based metaphorical expressions were collected from various online resources. The Arabic corpus, in particular, was collected from Al-Maani dictionary, Ilyas (2014), Arab informants and the author's own collection as a native speaker of Arabic. The Arabic color-metaphors were verified by two professors at the Arabic department to make sure that the sample includes color-based metaphorical expressions only and does not include mere phrases consisting of nouns and adjectives. The majority of the Arabic color-based metaphorical expressions are common in Standard Arabic, with few from spoken Arabic dialects in different Arab countries. Many are common in both standard and colloquial Arabic.

4.2 Color-based metaphorical expressions in English and Arabic

The color words *black, white, red, yellow, green, blue, pink, orange* are adjectives and nouns in both English and Arabic, with few derived forms in English such as: (i) derived verbs: *blacken, whiten*; (ii) derived gerunds: *whitening*; (iii) derived adjectives: *yellowish, greenish, reddish, brownish* etc.; (iv) some color words have plural forms: *whites, blacks.* Since Arabic is a derivational language, several forms are derived from most color names and are used in metaphors such as:

- Derived transitive verbs (TV): يبيضّ ('turn white'), يصفرّ ('to turn yellow'), يزرقّ ('to turn blue'), يحمرّ ('to turn red'), يسود ('to turn black'), يخضرّ ('turn green').
- Derived action nouns derived from IV: اسوداد ('becoming black'), ازرقاق ('becoming blue'), احمرار ('becoming red'), اصفرار ('becoming yellow'), اخضرار ('becoming green').
- Derived agents and patients: مبيض ('whitish'), مصفر ('yellowish'), محمر ('reddish'), مزرق ('bluish'), مسود ('blackish').
- Color names have masculine and feminine forms, and singular and plural forms: اسود *black*, singular, masculine, سوداوان *black*, dual, masculine and feminine, سود *black,* plural, masculine, سوداء *black*, singular, feminine, سوداوات *black*, plural, feminine.

In addition, Arabic has dual color names الأسودان ('the two blacks', i. e., 'dates and water'), الأسمران ('the two blackish', i. e., 'water and wheat'), الاحمران ('the two reds', i. e., 'meat and wine'), الأخضران

('the two greens', i. e., 'grass and trees'), each of which has one or more metaphorical meanings such as: الأبيضان ('the two whites' referring to 'milk and water'), الأصفران ('the two yellows', i. e., 'gold and saffron'). There is no dual form for *blue, brown, orange,* or *pink*.

4.3 Data analysis

Each English color metaphor was translated into Arabic and each Arabic color metaphor was translated into English. Then, color-based metaphorical expressions were classified into the following categories: (i) color-based metaphorical expressions that are identical in their conceptual basis (meaning) and linguistic form (wording) in both languages such as *white lie* – 'كذبة بيضاء'; (ii) color-based metaphorical expressions that are the same in conceptual basis, but different in linguistic form as in *black sheep* – ابن البطة السوداء ('black duck'); (iii) color-based metaphorical expressions that have the same linguistic form but different conceptual bases such as *Black Stone* which has a literal meaning in English, but in Arabic, it refers to the holy stone in Kaaba in Makkah; (iv) color-based metaphorical expressions that exist in English but have no equivalents in Arabic (*paint the town red*); (v) color-based metaphorical expressions that exist in Arabic but have no equivalents in English يا خبر اسود ('what bad news').

The percentages of color-based metaphorical expressions in each category were computed. Translations, comparisons and categorization of English and Arabic color-based metaphorical expressions were verified by two professors of English-Arabic translation. Disagreements were solved by discussion.

4.4 The color-metaphor test

At the beginning of the semester, beginner and advanced student groups were given one of two versions of a color-metaphor test, as the students took the test in different class sessions. Each version of the test consisted of 25 English and 30 Arabic color-based metaphorical expressions that were randomly selected from the English and Arabic color-metaphor corpora collected and which covered color-based metaphorical expressions in all five categories. The items were presented in isolation as presenting them in context would help the students infer their meaning. The test instructions specified what the items were. The subjects were asked to translate English color-based metaphorical expressions into Arabic and Arabic color-based metaphorical expressions into English. The subjects were not allowed to use a dictionary. No time limit was imposed on the test session.

4.5 Analyzing students' responses

The subjects' written responses to the color-metaphor test were marked by the author. To be marked correct, each English and Arabic color metaphor had to be translated correctly, either by an equivalent color metaphor or by an explanation if equivalents are absent. To find out the strategies that the subjects used in translating color-based metaphorical expressions, mistranslations were compiled and subjected to further analysis. Translation strategies were classified into: (i) avoidance (leaving the answer blank), (ii) literal translation, (iii) explanation, (iv) partial translation, (v) contextualized guessing, (vi) use of synonym, (vii) confusing color

metaphors with non-metaphorical phrases, (viii) inventing their own metaphors, (ix) free language expression, and (x) extraneous translation. The color-metaphor translation error corpus consisted of 2185 incorrect responses for both groups. Quantitative and qualitative data analyses of the color-metaphor error data are reported.

4.6 Test reliability

Since it was not possible to use parallel forms, split-halves of each full test, or re-test the students two weeks after the first administration of the test, reliability of the test scores was calculated using the Kuder-Richardson 21' formula as it estimates the internal-consistency of the test items from a single administration of the test. The reliability coefficient of the color- metaphor test scores was .70 for the beginners' group and .73 for the advanced group. Inter-scorer reliability was also calculated by having a colleague who taught translation mark a sample of answer sheets and by comparing both analyses. There was a 94 % agreement between the two scorers in identifying those color-based metaphorical expressions available in both English and Arabic and those that are available in one language only and classifying the translation strategies utilized by the subjects. Disagreements were solved by discussion.

5 Results

5.1 Translation equivalence in English and Arabic color-based metaphorical expressions

Analysis of the meaning equivalence of English and Arabic color-based metaphorical expressions showed that 30 % of the color-based metaphorical expressions in the English and Arabic data are identical in their conceptual basis and linguistic form as in: *white lie* – كذبة بيضاء, *black market* – السوق السوداء, *red line* – خط احمر, *yellow journalism* – الصحف الصفراء, *green light* – الضوء الأخضر, *white smoke* – الدخان الأبيض, *black belt* – الحزام الأسود, *black record* – سجل اسود, *black magic* – سحر اسود.

Data analysis also showed that color-based metaphorical expressions that exist in English but have no equivalent metaphors in Arabic constituted 58 % of the data as in *white hope, paint the town red, white magic, give a black eye, green old age, green with envy, blue-blooded, once in a blue moon, out of the blue.* Likewise, color-based metaphorical expressions that exist in Arabic but have no equivalent metaphors in English constituted 60 % of the corpus as in: أيادي بيضاء ('white hands', i. e., 'good deeds'), وجهه اصفر ('his face turned yellow', i. e., 'he looks pale/scared'), الخط الأزرق ('blue line'), ابيضت عيناه ('his eyes turned white because of sadness'), قرشك الأبيض ليومك الأسود ('save your silver money for your black day'), قلبه أبيض ('white-hearted', i. e., 'good-hearted', 'have good intentions', or 'innocent'), ليلة بيضاء ('white night', i. e., 'happy, joyful night'), مسيرة بيضاء ('white path', i. e., 'a lifetime full of good deeds'), منافسة بيضاء ('white competition', i. e., 'fair competition'), نسخة بيضاء من فكرة سوداء ('white version from a black idea', i. e., 'to create a good idea from a bad/evil one'), السوداء الأفكار ('black ideas', i. e., 'evil ideas'), أيام سوداء ('black days', i. e., 'hard times').

Thirdly, color-based metaphorical expressions that have the same conceptual basis in both English and Arabic but different linguistic forms constitute 5 % of the Arabic corpus and 6 % of the English corpus as in ابن البطة السوداء ('black duck', i. e., 'black sheep'), احمر وجه ('red-faced', i. e., 'blushed', once in a 'blue moon'). Similarly, color-based metaphorical expressions that have a similar linguistic form in both languages but different conceptual bases constitute 5 %

of the Arabic corpus and 6 % of the English corpus as in: (a) *Men in blue* referring to the police in English but in Arabic it means 'men who live in the desert'; (b) *Bluetooth* refers to Bluetooth technology in English, but in Arabic it means 'a guy who is mean'; (c) *red-eye* in English means 'a journey that leaves late at night and arrives early in the morning', but *to show the red eye* – يريه العين الحمراء in Arabic means 'a person who is an intimidator'; (d) *Snow White* is a popular fairy tale character in English, but in Arabic it means 'as white as snow' and refers to the fairy tale character as well; (e) *Black Stone* has a literal meaning in English, but in Arabic it refers to the holy stone in Kaaba in Makkah.

5.2 Students' difficulties with English and Arabic color-based metaphorical expressions

Analysis of the subjects' responses to the English and Arabic color-metaphor tests showed that beginners as well as advanced students had considerable difficulty in translating English color-based metaphorical expressions to Arabic, and Arabic color-based metaphorical expressions to English. Beginners and advanced students gave a total of 3245 and 3540 responses to the test items respectively. Both groups left 41 % blank. The typical beginners and advanced students responded to 31 % and 28 % of the color-based metaphorical expressions on the whole test respectively. Less than 34 % of their responses to the test items were correct (cf. Table 2).

Table 2: Mean, median, range and total number of correct and incorrect responses to the color-metaphor test items

Group	N	Color metaphors	Mean		Median		Range		Sum	
			Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Advanced	55	Arabic	39.1 %	42.3 %	28 %	39 %	5-21	5-39	440	495
		English	32.4 %	43.1 %	23 %	44 %	4-19	4-39	330	550
		Total	27.4 %	37.4 %	25 %	34 %	4-21	4-39	770	1045
Beginners	60	Arabic	37.2 %	44.7 %	24 %	29 %	3-17	3-20	480	540
		English	32.4 %	46.2 %	20 %	34 %	2-14	2-15	360	600
		Total	21 %	39 %	25 %	34 %	2-17	2-20	840	1140

No significant differences were found between beginners and advanced students in the total test scores ($T = .25$; $p > .69$), the Arabic color-metaphor subtest scores ($T = 1.9$; $p > .63$), nor the English color-metaphor subtest scores ($T = 2.5$; $p > .54$). However, results revealed significant differences between the English and Arabic color-metaphor test scores for the advance group ($T = 3.6$; $p > .01$), but not for the beginners ($T = 1.6$; $p > .78$). This means that advanced students have slightly more difficulties in translating English than Arabic color-based metaphorical expressions, whereas beginners have comparable difficulties in both. A positive correlation was found between the subjects' English and Arabic sub-test scores ($r = .34$; $p > .01$), i. e. students' ability to translate English color-based metaphorical expressions into Arabic and vice versa. This means that competence in translating English color-based metaphorical expressions is

related to that of translating Arabic color-based metaphorical expressions, and that weakness and/or improvement in one, results in weakness and/or improvement in the other.

Results also showed that about 41 % of the English items were left blank by all the subjects. Fewer than 25 % of the English and Arabic items were translated correctly and 34 % were translated incorrectly. Color-based metaphorical expressions that were translated correctly were those that are similar in both English and Arabic such as: *black list* – القائمة السوداء, *red line* – خط أحمر, *green light* – الضوء الأخضر.

Qualitative data analysis of the error data showed that color-based metaphorical expressions with an idiomatic meaning were found to be more difficult than those that are more transparent. The fact that 60 % of the Arabic color-based metaphorical expressions in the corpus have no equivalent color-based metaphorical expressions in English, and that 58 % of the English color-based metaphorical expressions in the corpus have no equivalents in Arabic, makes the acquisition of color-based metaphorical expressions in both languages difficult. The students' difficulties in translating Arabic color-based metaphorical expressions to English may be due to inadequate linguistic competence in English, whereas their difficulties in translating English color-based metaphorical expressions to Arabic may be due to comprehension problems, as their meaning is not transparent, and they are culturally unfamiliar.

Findings of the present study are consistent with findings of prior studies which found that metaphorical expressions are problematic for non-English speaking students participating in academic lectures in English (cf. Littlemore 2004, Littlemore et al. 2011) and in academic reading in discipline-specific contexts (cf. Sandgren 2014). L2 and translation students have difficulty comprehending and translating metaphors regardless of their proficiency levels. As in the present study, no differences were found between undergraduate and graduate L2 Swedish readers in their ability to comprehend metaphorical expressions in English while reading. The frequency of comprehension errors was unexpectedly high in both groups, which indicates that their knowledge construction is hindered. Although the students' knowledge of the English language was high, metaphorical expressions still caused comprehension problems (cf. Sandgren 2014).

Findings are also consistent with studies conducted with Arab students such as Alsadi (2016) and Zibin (2016). Alsadi (2016) found that Qatari EFL students at the Department of Language and Literature had difficulties in comprehending and producing English metaphorical expressions due to their unfamiliarity with the English culture, and their inability to evaluate whether a statement is metaphorical or literal. Likewise, Zibin (2016) found that Jordanian EFL college students had difficulty in comprehending metaphorical expressions in English.

As in the present study, Charteris-Black (2002) indicated that figurative expressions, with an equivalent conceptual basis and linguistic form, are the easiest for Malay EFL students. However, the most difficult were those with a different conceptual basis and an equivalent linguistic form, and with culture-specific expressions that have a different conceptual basis and a different linguistic form. The students resorted to their L1 conceptual basis when they processed unfamiliar L2 metaphorical expressions.

5.3 Strategies used in translating English and Arabic color-based metaphorical expressions

No significant differences were found between beginners and advanced students in the present study in the strategies they utilized in translating English and Arabic color-based metaphorical expressions. Those strategies were as follows:

(i) **Avoidance** which was the most common strategy, as 41 % of the items on the test were left blank such as: ضحكة صفراء، ('yellow smile', i. e., 'cynical'), الاخضران ('the two greens', i. e., 'grass and trees'), حمراء النَّعم ('red camels', i. e., 'camels of good breed'), الياقات الزرقاء ('blue collars'), الأَحْمران ('the two reds, i. e., 'meat and wine'), فلانٌ أَخضر ('a green person', i. e., 'young and inexperienced'), حصان أزرق، ('blue horse', i. e., 'thoroughbred horse'), الأشعة فوق البنفسجية ('ultraviolet rays') in Arabic; and *green about the gills, green party, green cross code, green power, green spit, green eye, blue film/magazine/video, blue one`s money, blue-blooded, blue murder, beet red, once in a blue moon, out of the blue,* and *see pink elephant, red herring* in English as they are opaque.

(ii) **Literal translation.** The subjects tended to translate color-based metaphorical expressions word-for-word, i. e., as consisting of two single words, not as a unit, although Arabic equivalents with the same conceptual basis but a different linguistic expression exist, as in the following faulty responses:

English is ST		**Arabic is ST**	
silver spoon	ملعقة فضة	يريه العين الحمراء	*show the red eye*
silver plate/platter	صحن فضة	الأخضر واليابس	*green and dry*
black as thunder	رعد أسود	وجهه أصفر	*his face is yellow*, i. e., *pale*
black cap	قبعة سوداء	الأقلام الصفراء	*yellow pens*
show the red card	يطرد لاعب من المباراة	الصحف الصفراء	*yellow newspaper*
red eye	العين الحمراء	كتب صفراء	*yellow books*

In the above examples, the subjects transferred the wording of the source color-based metaphorical expressions to their word-for-word equivalents, although each has a different wording in the TL (Arabic on the left and English on the right). The English color-based metaphorical expressions *silver spoon, silver plate*, *white with fear, black sheep* were translated into ملعقة فضية خروف أسود، أبيض من الخوف، صحن فضي، respectively, although the equivalent Arabic color-based metaphorical expressions are ابن البطة السوداء , a ذهب ملعقة من ,ذهب طبق من ذهب , وجهه أصفر من.الخوف.

(iii) **Explanation.** In some cases, some students explained the meaning of the color metaphor as in:

- بيضت وجهي *did something that made me proud*
- أيام سوداء *hard times, difficult times, rough days, unhappy days*
- يريه العين الحمراء *to be strict with his child*
- خبر أسود *bad news*
- *out of the blue* بشكل غير متوقع
- *once in a blue moon* في السنة مرة

(iv) **Contextualized guessing.** Some students translated *catch someone red-handed* into يضبط شخصا ويداه ملطخة بالدماء. Here, the students knew the meaning of 'catch someone' but interpreted *red-handed* as 'covered with blood'.

(v) **Partial translation.** Here some subjects translated part of the color-based metaphorical expressions and left the other part blank as in:
- *white with fear:* خائف *scared* without *white*
- *green old age:* سن الشيخوخة *old age* without *green*
- *green with envy:* حسود *jealous* without *green*
- حصان ازرق ('blue horse', i. e., 'thoroughbred'): *horse without blue*
- *pitch black:* أسود *black* without *pitch*

(vi) Use of **synonyms** as in:
- فُرْصة ذهبيَّة *golden chance* instead of *golden opportunity*
- سنة سوداء *gloomy year* instead of *dark year*
- صفحة بيضاء *white page, blank page* instead of *white paper*
- منطقة رمادية *grey region* instead of *grey area*
- عصر ذهبي *golden period of time* instead of *golden age*
- صحف صفراء *yellow newspapers* instead of *yellow journalism*
- *White paper* ورقة بيضاء instead of صفحة بيضاء

(vii) **Confusing** color-based metaphorical expressions with similar non-metaphorical phrases, such as:
- صفحة بيضاء *(ST): white page, blank page* and *white paper*
- *white paper (ST):* ورقة بيضاء and صفحة بيضاء

(viii) **Inventing their own metaphors** as in: احلام برتقالية was literally translated into *orange dreams*, and *Blue Murder* as جريمة فظيعة ('horrible crime'), جريمة شنيعة ('terrible crime'), as the name of the movie was not part of their background knowledge.

(ix) **Free language expression,** i. e., using their own words, not the fixed expression of the metaphor as in saying*: golden heart* instead of *a heart of gold* as an equivalent to قلب من ذهب.

(x) **Extraneous translation.** Some subjects did not know what a color metaphor means, so they just gave any phrase that they knew, without checking the accuracy of the meaning as in:
- فلان أخضر *green man*
- *blackmail someone* 'يرسل بريد اسود لشخص' , يرسل بريد سيء *the students* separated *blackmail into black + mail* and translated them as two separate words with literal meanings, not as a compound with an idiomatic meaning.
- *blue chip* 'شريحة زرقاء'.

The strategies subjects in the present study utilized in translating color metaphor are similar in type, but different in degree of difficulty to those utilized by Jordanian students in Zibin's (2016) and Smadi/Alrishan's (2015) studies, by Malay students in Charteris-Black's (2002) study, and by Swedish students in Sandgren's (2014) study. In Zibin's study, EFL college students' receptive knowledge of metaphors varied according to the type of metaphor: Metaphorical expressions that have a completely different conceptual basis in both English and Arabic, but are similar in linguistic expression (form), were the most difficult. Those that are totally different conceptually and linguistically in both languages elicited a significantly lower number of correct responses (52 %). Those that have different conceptual bases and linguistic expressions in English and Arabic, or where the conceptual bases are culturally neutral, elicit-

ed a good number of correct responses (71 %). Those that have an equivalent conceptual basis in English and Arabic, but completely different linguistic expressions in both languages, were easy for the participants (81 %). The easiest to recognize were those that have the same conceptual bases and linguistic expressions (94 %), and those that have the same conceptual bases and similar linguistic expressions in both languages (85 %).

The strategies used in translating color-based metaphorical expressions in this study are similar to those used in translating idioms in Smadi/Alrishan's (2015) study who found that the most efficient strategy utilized by EFL Jordanian graduate students in translating opaque idioms was paraphrasing. The researchers attributed their finding to the degree of semantic transparency of the idioms under investigation. They added that variety in students' strategies in translating English idioms into Arabic reflects differences in students' linguistic and pragmatic competence and their familiarity with those idioms. Moon (1998: 219) described "pure idioms" as "opaque metaphors" which cannot be understood without knowledge of their historical origins. This is true in the case of old Arabic color-based metaphorical expressions that require historical knowledge of the metaphor as in: (i) الحمراء ('the Red'), referring to non-Arabs; (ii) الزُرق ('the blues'), referring to spears and arrows; (iii) الأخضران ('the two greens'), referring to grass and trees or night time and the sea; (iv) الأسود ('the black with two sides'), referring to kind of snake; and Islamic color-based metaphorical expressions that require a conceptual basis as in: (a) الأحمر والاصفر ('the red and the yellow', i. e., 'all mankind'); (b) الخيط الأبيض من الخيط الأسود ('tell the white thread from the black thread', i. e., 'see the line that separates darkness from daylight'); (c) حمر النعم ('the red camels', i. e., 'best breed'); (d) يوم تبيض وجوه وتسود وجوه ('when some faces turn white and others turn black on the day of judgment', i. e., 'when some people feel happy and proud and other feel embarrassed, i. e., defamed, honored').

Sandgren's (2014) found that the most common cause of misunderstanding was cultural richness not the type of metaphorical expression. Comprehension of metaphorical expressions in two languages requires four main strategies by L2 readers: (i) Prior knowledge, (ii) guessing, (iii) translation, and (iv) context decoding. All these strategies involve bottom-up and top-down processing. Prior knowledge includes everything the reader brings to the text, such as general knowledge of the world, cultural knowledge, topical knowledge and specialist knowledge. Background knowledge, in particular, seems to be extremely important for translating color-based metaphorical expressions. In this respect, Anderson et al. (1977: 21) argued that "language comprehension always involves utilization of one's knowledge of the world", and that "many problems in reading comprehension are traceable to deficits in knowledge rather than deficits in linguistic skill".

The mistranslation strategies that subjects in the present study used reflect insufficient knowledge of English and Arabic color-based metaphorical expressions, what they mean, lack of historical knowledge and conceptual basis resulting in an inadequate ability to comprehend, match and transfer their meaning from one language to the other. In addition, the subjects had inadequate knowledge of the English culture. Al-Kharabsheh (2003) pointed out that the subjects' poor linguistic competence, their poor contrastive analysis ability and poor translation competence, the varying degrees of opaqueness in color metaphor, lack of sufficient experience and practice are factors that give rise to a wide range of mistranslations of English and Arabic color-based metaphorical expressions. Furthermore, students' difficulty with color-based metaphorical expressions may be due to inadequate instruction. Zibin (2016) indicated that metaphorical expressions are opaque as their conceptual basis reflects the encoding of a cul-

ture-specific meaning. Their conceptual bases and linguistic expressions are completely different in both English and Arabic.

6 Conclusion and recommendations

Translation of metaphor, in general, and color-based metaphorical expressions, in particular, poses several challenges to students when they approach them linguistically, conceptually and culturally. Results of the present study revealed that beginners as well as advanced translation students at COLT have considerable difficulty in translating English and Arabic color-based metaphorical expressions, especially those that are culture-specific, or those with an idiomatic meaning. To help students master English and Arabic color-based metaphorical expressions, the author recommends that translation instructors raise students' awareness of the similarities and differences between English and Arabic color-based metaphorical expressions, the idiomatic meaning of some, how to translate those that exist in one language but not in the other, those that are similar in both languages in conceptual basis but different in linguistic form, those that are similar in the linguistic form but different in the conceptual basis, those that are culture specific, those that have a literal as well as a connotative meaning, and those with multiple meanings.

Since color-based metaphorical expressions are loaded with attributive, connotative meanings, semantic, pragmatic and communicative aspects should be taken into consideration. The amount of knowledge that translation students have about the similarities and differences between English and Arabic color-based metaphorical expressions will help the students comprehend and interpret them correctly.

To understand the literal and connotative meanings of unfamiliar color-based metaphorical expressions, translations students can check specialized English-English and English-Arabic dictionaries such as *Al-Maany Online Dictionary*, as such dictionaries, Bojović (2014) indicated, offer a unique treatment of metaphors, show how lexicalized metaphors and phrases have monosemous or polysemous metaphorical meanings, in addition to some specific regular patterns which can help students in the cognitive mechanism of translating metaphors.

Enriching students' prior (background) knowledge is of great importance as well. Providing students with language and translation activities can help enhance their knowledge of color-based metaphorical expressions and develop their ability to transfer their meaning from English to Arabic and vice versa.

Translation students can engage in the translation process and can practice and gain skills in all figurative language translation strategies. They can practice the translation procedures suggested by Schäffner (2004): substitution (metaphor into a different metaphor), paraphrase (metaphor into sense), or deletion. They can also practice Newmark's follow procedures: (P1) reproducing the same image in the TL; (P2) replacing the image in the SL with a standard TL image which does not clash with the TL culture; (P3) translating the metaphor by a simile, retaining the image; (P4) translating the metaphor (or simile) by a simile plus sense, or a metaphor plus sense; (P5) conversion of metaphor to sense; (P6) deletion when the metaphor is redundant or serves no practical purpose; and (P7) translating the metaphor by the same metaphor combined with sense. Since there is no one-to-one correspondence between numerous Arabic and English color-based metaphorical expressions, the students can practice the following strategies in translating those that do not exist in the TL: (a) taking into consideration the connotative and idiomatic meanings of color-based metaphorical expressions; (b) using

non-literal (free) translation in some cases; and (c) giving explanatory equivalents in others as يا نهار ابيض – *what a bad day!* and ، يا ويلك يا سواد ليلك *the devil to pay.* Since the interpretation of and translation of metaphors is culturally conditioned, student translators can choose among three translation equivalents: (i) an exact equivalent of the original metaphor; (ii) a metaphorical phrase which would express a similar sense; (iii) replacing an untranslatable metaphor in the ST with its approximate literal paraphrase in TT (cf. Dobrzyńska 1995).

Finally, translation students and instructors may compile English and Arabic color-based metaphorical expressions together with their equivalents for future reference. Translation students' difficulties with multi-word units in English and Arabic such as those that contain body parts – رأس 'head', وجه 'face', عين 'eye', فم 'mouth', لسان 'tongue', يد 'hand', ساق 'leg', قدم 'foot' – or family members – أبو 'father', أم 'mother', أخ 'brother', أخت 'sister', أبن 'son', بنت 'daughter' – are still open for further investigation by future studies.

Appendix

The Color-Metaphor Translation Test

Test Version 1: Translate each Arabic metaphor into English and each English metaphor into Arabic.

بيضت وجهي بيض الله وجهك – صفحة بيضاء – مسيرة بيضاء – ابن البطة السوداء – الأسود والأحمر – أيام سوداء الخيط الأسود – سجل اسود – سودت عيشتي – صفحته سوداء – علامة سوداء – قلبه اسود – لابس نظارة سوداء – احمرّ وجهه – حمراء النَّعم – العين الحمراء – الموت الأحمر – اصفَر واحمرّ – الأقلام الصفراء – الصحف الصفراء – كتب صفراء – ضحكة صفراء – الأخضران – شابٌّ أَخضرُ – النِّطاق الأخضر – عدوٌّ أزرقُ – الطَّبْعة الزَّرْقاء – ذكريات برتقالية – الياقات الزرقاء – الفريق البرتقالي – أحلام وردية.

raise a white flag – white as a ghost – white house – white paper – beat somebody black and blue – black as night – black as thunder – black cap – black eye – black letter day – black market – black spot – blackmail someone – give a black eye – pitch black – show the red card – beet red – like a red rag to a bull – red hot – red herring – red tape – red-eye – to see red – to see the red light – a yellow streak.

Test Version 2: Translate each Arabic metaphor into English and each English metaphor into Arabic.

الاشعة فوق البنفسجية – رمادية المشاعر – قلب من ذهب – نصيحة ذهبيّة – بطاقة ماسية – عصر ذهبي – قُرْصة ذهبيَّة – أيادي بيضاء – الراية البيضاء – كذبة بيضاء – يا نهار ابيض – خبر اسود – سنة سوداء – الصندوق الأسود – القائمة السوداء – نقطة سوداء – الأَحْمران – الأَشْعَّةُ تحْتَ الحَمْرَاءِ – السَّنة الحمراء – الكُرَيَّات الحُمْر – كتب صفراء – الحمى الصفراء – فلانٌ أخضر – حصان أزرق – ماء أزرق – أحلام برتقالية – حياة وردية – أحلام رمادية – منطقة رمادية

green thumb – green about the gills – green cross code – green power – green finger – blue chip – blue one's money – blue-blooded – blue murder – once in a blue moon – out of the blue – see pink elephants – silver spoon – silver plate – golden handshake – golden boy – silver hair – bronze age – show the white feather – white with fear – out of the red – catch someone red-handed – paint the town red – roll out the red carpet – green with envy.

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