



Aestheticization of Scientific Texts

Estetização de textos científicos

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ABSTRACT: Currently, there is no doubt about the availability of expressive means in the texts of scientific content. The aim of the paper is to analyze aesthetics means in scientific texts due to the author's individuality and dialogical nature of scientific communication. The research materials are Spanish scientific articles and theses. The findings are discussed regarding the idea that there is a common intertextual space between the text created by the author and other texts that made up the author's cultural and scientific experience. The conclusion is made that besides the traditional functions of intertextuality in the scientific text there is an aesthetic function.

KEYWORDS: scientific text; author; aestheticization; interdiscursivity.

RESUMO: Atualmente, não há dúvidas sobre a disponibilidade de meios expressivos nos textos de conteúdo científico. O objetivo do artigo é analisar os meios estéticos em textos científicos devido à individualidade do autor e ao caráter dialógico da comunicação científica. Os materiais de pesquisa são artigos e teses científicas em espanhol. Os resultados são discutidos considerando a ideia de que existe um espaço intertextual comum entre o texto criado pelo autor e outros textos que compuseram a experiência cultural e científica do autor. Conclui-se que, além das funções tradicionais da intertextualidade no texto científico, existe uma função estética.

PALAVRAS-CHAVE: texto científico; autor; estetização; interdiscursividade.

1 Introduction

1.1 Overview of an Aestheticization Concept

The term “aestheticization” has become quite common in contemporary philosophical and cultural discourse, primarily in the description of the state of modern culture. In this context, aestheticization means, first of all, the acquisition of an aesthetic character by those aspects of modern life that previously remained far from the traditional subject of aesthetics.

Until the end of the 20th century, it was believed that the purpose of scientific work was to present the facts and data as objectively, clearly and briefly as possible. The author of a scientific study does not express his/her feelings and emotions, does not deal with the embellishment of the scientific work, because, in the scientific exposition, the accuracy and conciseness of style are more important than its originality and imagery (CRYSTAL; DAVY, 1969; HARRIS, 1997; ROBINSON, 1973).

At present, there is no doubt about the presence of expressive means in texts of scientific content. Expressiveness and aestheticization, in the sense of the best way to implement communication taking into account the characteristics of communication in this field, are essential communicative features of the scientific speech. Therefore, studying the expressive aspect of the scientific style appears to be particularly relevant and timely. The use of expressive means in scientific speech is conditioned by such its quality as dialogicality, that is, by establishing contact with the recipient of the message (BERENIKE HERRMANN; BERBER SARDINHA, 2015; LAKIC *et al.*, 2015; NASCIMENTO SOUTO, 2015).

The relevance of this study is determined by the common interest of many scientific fields’ researchers to the phenomenon of discourse, by the need to study complex cognitive operations activated by the interaction of discourses at the level of the author’s mental processes, as well as by the attention to the manner of presentation and the perception of scientific literature, taking into account the broad socio-cultural context and the norms of written speech adopted in different academic communities, in this particular case – in the Spanish community.

Also relevant to the theory of language is the study of various types of intertextual links within the scientific discourse in a communicative-discursive way from the standpoint of anthropocentrism. The proposed approach allows the consideration of links between the represented

discourses at the formal, semantic, cognitive-situational, and communicative-pragmatic levels. The subject of the study is intertextual inclusions from literary discourse in scientific text forming its aestheticization. The object of the study is the cognitive and communicative-pragmatic properties of the included and receiving texts.

1.2 The Concepts of Text – Discourse and Intertextuality – Interdiscursivity

In modern science, the text is considered as a particular aspect of a broader phenomenon – discourse and explored by the discipline called discourse analysis. The text is one of the elements, of course, fundamental, but not the only one in the complex system of the communicative process. Kristeva (1967, p. 443) in the essay “Bakhtine, le mot, le dialogue et le roman” expresses the idea that a text is constructed as a mosaic of quotations, this being the absorption and transformation of another text. All texts are intertexts because they refer to, recycle and draw from the preexisting texts. Any work of art is an intertext that interacts with the other texts, rewrites, transforms or parodies them. Barthes (1970) stresses that intertextuality has no relation with the old notion of source or influence since every text is already an intertext; at varying levels, other texts are inserted into a text in more or less recognizable forms, that is, texts belonging to the culture of the previous text and those of the surrounding culture.

Intertextuality refers to the interdependent ways in which texts stand in relation to one another to produce meaning. They can influence each other, be derivative of, parody, reference, quote, contrast with, build on, draw from, or even inspire each other (BAKHTIN, 1986; DRÖBINGER, 2018; NWADIKE, 2018; GAÁL-SZABÓ, 2017; KRISTEVA, 1967). De Beaugrande and Dressler (1981) argue that intertextuality is one of the requirements that a text must fulfill to be considered a text; it determines the way in which the use of a certain text depends on the knowledge of other texts.

1.2.1 Text and Discourse

A text whole arises under the influence of a certain set of extralinguistic and text forming factors. The emphasis on the recognition of this fact in modern text theory has led to a decisive shift in research interests from the issues of an internal textual organization to the processes of text building and

meaning-making. Discourse refers to the text in continuous connection with the situational context, which determines everything essential for generating this text, in connection with the system of communicative and pragmatic goals of the author, interacting with the addressee. In this regard, it becomes obvious the distinction between the concepts of “text” and “discourse” and the tasks of traditional analysis and discourse analysis. The text analysis is aimed at the internal text links; the discourse analysis characterizes the features of the communicative process that are external to the text.

As Bloor points out, “discourse” is sometimes used in contrast with “text”, where “text” refers to actual written or spoken data, and “discourse” refers to the whole act of communication involving production and comprehension, not necessarily entirely verbal. The study of discourse, then, can involve matters like context, background information or knowledge shared between a speaker and hearer (BLOOR; BLOOR, 2013).

The problem of studying such a complex and multifaceted phenomenon as the discourse was dealt with by linguists, literary critics, philosophers, sociologists and representatives of other related sciences for a long time. Offering different interpretations of the “discourse” concept, researchers agree that discourse, in addition to text, includes extra-linguistic factors as well, which have a significant impact on the process of communication unfolding within this context.

The concept of discourse can be seen in some contexts, referred to in the works by a well-known researcher van Dijk (2007, 2014):

- discourse in the broad sense. Discourse is a communicative event that occurs between the speaker and the listener (the observer, etc.) during the process of communicative action in a certain timed, spatial and another context. This communicative action can be oral, written, have verbal and non-verbal components;
- discourse in the narrow sense is a written or oral verbal product of communicative action (a text or a conversation);
- discourse is a relevantly uttered text, and text is an abstract grammatical structure of the uttered (speech/language);
- discourse as a specific conversation. Using the concept of “discourse” always concerns some specific objects in a particular situation and a particular context;

- discourse as a genre. The concept of discourse is used to refer to a particular genre, such as “news discourse”, “political discourse”, “scientific discourse”, and others.

As Chernyavskaya (2017, p. 137) notes, discourse should be understood as texts in close connection with the situational context: in conjunction with the social, cultural, historical, ideological, psychological and other factors, with the system of communicative-pragmatic and cognitive goals of the author. Discourse characterizes the communicative process leading to the formation of a certain formal structure that is the text.

The text today is analyzed together with the next unit of the communicative hierarchy, discourse. The text does not oppose discourse but coexists with it. Discursivity, as one of the signs in the textual system, characterizes a special property of the text, which is its integration into the metaspace of discourse, the content of which is revealed in the interaction of texts.

1.2.2 Intertextuality and Interdiscursivity

Following Fairclough (2010), can distinguish between intertextuality that relates different types of texts and discourses in their specific contexts, and interdiscursivity or constitutive intertextuality that occurs at a more abstract and global level with respect to relations between types of discourse (types of communicative activities and genres) rather than between specific texts.

Within the framework of this work, the relationship between different discourses is viewed as a result of active engagement between different spheres of human activity, different areas of experience and knowledge. In turn, this interaction is due to the growth of the cognitive needs of a person striving to cognize the surrounding reality in all its diversity. Interdiscursivity is a complex mental process, which consists of the interaction between discourses, namely between the cognitive models of situations reflected in the texts and between the communicative and pragmatic characteristics of texts conditioned by the specifics of sociocultural situations in communication. This mental process is initiated by the author of a scientific issue and is performed by the recipient.

The scientific text reflects the dialogue of different worldviews, cultural positions, scientific opinions, and the dialogue of the old and new knowledge. In the process of producing a scientific text, interdiscursive links are updated, involving the interaction of different systems of knowledge, ideas and points of view, cultural codes, and cognitive switching from one

knowledge system to another. The author of scientific work as a discursive linguistic personality, while creating his/her text, reproduces other person's texts in accordance with his/her worldview and emotional intelligence. Texts of this kind represent an individual worldview of a creative personality.

This paper analyzes the interaction between different discourses that occurs as a result of including such intertextual fragments as epigraphs and pictures from the literary works into the receiving scientific text aimed at its aestheticization. Cognitive and communicative-pragmatic characteristics of the intertextual inclusion are its discursive properties, through which such inclusion represents a certain type of discourse and invariably influences the receiving discourse.

1.3 Functions of Intertextuality

In 1997, Fateyeva developed the classification of the functions of intertextuality based on the classical model of language functions proposed in 1960 by Jakobson. Jakobson (1995, p. 313) singled out such functions as expressive, appellative, contact, poetic, referential and metalingual.

Fateyeva (1997, p. 14) submitted these functions from the perspective of intertext and distinguish the following in literary discourse: vocative (appeal), phatic (contact setting), referential, poetic and metatext functions. The expressive function of the intertext is manifested as much as the author of the text, through intertextual links, reports on his/her cultural and semiotic reference points and in some cases on pragmatic attitudes: the texts and authors on which the references are made may be prestigious, fashionable and odious. The kind of quotations and allusions is an important element of the author's self-expression.

Mikhailova (1999, p. 138), when analyzing scientific texts, suggests establishing four main functions performed by intertextual relations: reference, evaluation, etiquette and decorative. The reference function is a prototype in scientific discourse. The inclusion of the element of "alien" text in a scientific work refers to the addressee to another, previously created text for the additional information necessary for a more complete understanding of this text. The reference function of intertexts fell into:

- a) informative;
- b) explanatory;
- c) appellative types.

The informative type of the reference function serves to compress information; the explanatory one is realized to clarify the statement for an adequate understanding of the scientific text; appellative is implemented if the author of a scientific issue establishes a connection with the source of borrowed information to rely on an authoritative opinion when finding his/her solution to the problem. Intertextual relations in scientific discourse often perform the function of evaluation. Mikhailova proposes to subdivide the evaluation function of intertextual links into critical, reflecting the negative attitude of the author to the quoted passage, and empathic (positive) types.

The etiquette function of intertextual relations is due to the mandatory use of pretexts published in this field of science as an expression of respect for the scientific community. According to Mikhailova (1999, p. 140), the decorative function can be performed by examples borrowed from “alien” works, successful definitions, formulated once by reputable scientists and passing from article to article, vivid quotes.

1.4 Aestheticization in Science

Aesthetics is a branch of philosophy that deals with the nature of art, beauty, and taste and with the creation or appreciation of beauty. The word aesthetic is derived from the Greek “aisthetikos”, meaning “aesthetic, sensitive, pertaining to sense perception, which in turn was derived from “aisthanomai”, meaning “I perceive, feel, sense” (MERRIAM-WEBSTER DICTIONARY, 2019).

Aesthetics in this central sense has been said to start with the series of articles on “The Pleasures of the Imagination” which the journalist Joseph Addison wrote in the early issues of the magazine “The Spectator in 1712” (MATTEUCCI; MARINO, 2016, p. 68). The term “aesthetics” was appropriated and coined with new meaning by the German philosopher Alexander Baumgarten in his dissertation “*Meditationes philosophicae de nonnullis ad poema pertinentibus*” (“Philosophical considerations of some matters pertaining the poem”) in 1735 (GUYER, 2014). Baumgarten chose “aesthetics” because he wished to emphasize the experience of art as a means of knowing.

The scope of aesthetics and the main subjects of its research were quite clearly defined by Kant (1790). Kant included in the subject of

aesthetics a number of such fundamental problems as the categories of the beautiful and sublime and the problem of a judgment of taste.

During the end of the 18th and 19th centuries, this area of knowledge was elaborated in detail by the classics of European philosophy and quickly acquired great significance in philosophical thought. At the same time, the scope of aesthetics was, in fact, completely reduced to the problem of the analysis of art.

1.4.1 The variety of concepts “aesthetics”

The philosopher Welsch (1997) insists on the description of modern culture through the concept of “global aestheticization”. There are many ways to apply the concept of “aesthetics” in various contexts, which indicates the semantic diversity of this term, since, as Welsh believes, the concept of aesthetics can refer to feelings, pleasure, creativity, illusion, poetic, virtual, game, etc.

Pragmatically, aesthetics determines the possibility of creating a “good form”, external design, organization – this is its cosmetic aspect. On the other hand, this is about the process of creating forms, about creativity, which is its poetic aspect. Welsh bases his understanding of aesthetics on the original meaning of the term, which significantly expands its scope beyond the limits of the art to traditional aesthetic categories. He turns to the aesthetic design of reality, the aesthetics of the environment and the concept of global aesthetics.

General aestheticization can be called, firstly, the penetration of art into life, the construction of life according to the principles of art, the acquisition of its aesthetic nature; secondly, the erasure of specific aesthetic boundaries connected with the classical concept of art. In both cases, the literal meaning of the term “aesthetics” is refocused on attention to feeling, sensuality, the intensity of the emotional experience, sensory perception. This is the main trend in modern culture.

Contemporary philosophers representing the postmodernist discourse also point to the total aestheticization of modern society (BAUDRILLARD, 2009; BUDD, 2008; MIYAHARA, 2014; MOTTRAM; GORRILL, 2014; TALON-HUGON, 2018).

1.4.2 Aesthetization of modern human communication

Currently, an obvious feature of human communication is its aestheticization. According to Chernyavskaya (2018, p. 80), today a significant aesthetic potential is involved in the material organization of texts. This means that particular attention is given to the text form and its design. “The text form becomes a marker that provides maximum concentration”. Aesthetics relying on the design and outer beauty covers all areas of communication, including science. In the context of this study, pictures from literary discourse and epigraphs are considered as fragments of another discourse that influences the perception of the receiving scientific text being its aesthetic elements.

Pragmatically, aesthetics determines the possibility of creating a good form, external design, and special text organization. The visualization of the message is a general tendency towards aestheticization and at the same time manifestation of the polycode nature of our communication. The text in many of its forms of existence is perceived as the unity of the linguistic component and the accompanying picture. Verbal and visual are integrated into a coherent whole. Communicative interaction between the verbal text and the visual picture is considered as visualized intertextuality (KRESS; LEEUWEN, 2006). Scientific text as a communicative value is not limited to the language component. It includes various elements significantly affecting its overall perception. Thus, in conjunction with other signs, verbal signs most successfully realize their communicative functions and “similar to textual materials, the use of images in textbooks also needs to be taken into account” (ISNAINI *et al.*, 2019, p. 548). There are situations when a picture within a scientific text is in a way an embellishment, keeping the reader’s attention on the content.

Scientific discourse is a collection of scientific works as a result of the interaction between the author’s intentions, the possible reader’s reactions and the text that displays the work within the general cognitive space. The cognitive category of interdiscursivity reflects an interaction between various systems of knowledge, cultural codes and cognitive strategies.

Lotman (2005) stresses that the text created by an author is included in a complicated system of non-textual links, which create complex code for the information contained in the text. A complication of the text structure with objects of different coding allows the reader to decode the information more accurately. Researchers believe that the polycode texts directly affect

the sensory fabric of image consciousness, i.e. actualize “sensory-emotive arguments along with rational” (YEZHOVA, 2010, p. 28) and in order to know the world, people reflect it in their minds, language tools draw up a creative attitude of the text author to reality.

Miller (1998, p. 29), comparing the content of scientific articles with the scientific and popular literature, proves the importance of visual communication components of scientific documents. As a result of the comparison, it appears that the weight and the role of non-verbal components are much higher in the actual scientific literature than in non-fiction.

1.4.3 Features of the epigraph

The epigraph performs dialogic, cognitive and aesthetic functions, providing a continuous dialogue between different authors, texts and, in general, cultures, creates communicative space of scientific text and is determined by this communicative space. It is viewed as a textological unit bearing a character of coding the text meaning, through which the epigraph influences the understanding of the following text meaning.

Determination of the “epigraph” concept has changed significantly over the past two centuries and has evolved from an elementary definition to modern science’s consideration of epigraph as a metatextual and intertextual sign. Through epigraphs, the author opens the outer boundary of text for intertextual links, thus revealing the inner world of the work. The epigraph acts within the text is consistent with it, is assimilated, but is not dissolved completely within the new text.

Larkin (2010) believes that the consciousness of an individual personality contains a thesaurus – a “specific dictionary of internalized texts”, in which the individual’s knowledge of various cultural phenomena is reflected. This thesaurus acts as a mediator between the work’s author and the reader, implementing “the interaction between the text having a semantic structure and the thesaurus of the reader”.

A person draws the greater part of knowledge about the world from texts of various types rather than from explicitly personal experience. The composition of texts that make up the cognitive base of representatives from a particular linguistic-cultural community is formed by linguacultural universals – precedent texts. Thus, quoting the epigraph comes from the cultural thesaurus of a linguistic personality rather than from a donor text.

When analyzing scientific text, it is often necessary to deal with paratextual relations, when the interaction occurs between the text of the article and the epigraph.

According to Larkin (2010), the epigraph is a quotation or a saying included between the title of the text and its beginning, which allegorically interprets the text as if on behalf of another author. Constituting signs of the epigraph are its dialogicality, intertextuality, and aesthetic eidological functions.

2 The Methodological Basis of the Study

Scientific articles and theses by Spanish scientists of the period from 2004 to 2015 were used as a material for this study. The total sample size was 12,000 pages of scientific texts on various fields of knowledge (chemistry, geology, and geochemistry, mathematics, physics, and biology), based on which the mechanisms of relations between discourses represented by the included and receiving texts were considered, i.e. the process of interdiscursivity actualized by such paratextual elements as an epigraph and a picture.

2.1 The Theoretical Basis of the Research

The methodological basis of the study was the main provisions of the modern discourse theory developed in Russia and other countries. The following provisions proven in science served as a theoretical basis:

- in modern science, the text is viewed as a particular aspect of a broader phenomenon which is a discourse, and is explored by the discipline of discourse analysis (VAN DIJK, 2014; FAIRCLOUGH, 2010; FRANKLIN, 2017; TITSCHER *et al.*, 2015);
- texts have a common property characterized by the existence of the relationship between them (BAKHTIN, 1986; DRÖBIGER, 2018; CHERNYAVSKAYA, 2018; KRISTEVA, 1967);
- the discourse formation is not homogeneous; any discourse reveals the traces of the preceding discourse constructions (MAINGUENEAU, 2014, 2017; SERIO, 2001; WU, 2011);
- intertextuality and interdiscursivity are closely related (CHERNYAVSKAYA, 2017, 2018; SERIO, 2001; WU, 2011).

2.2 Methods

In the course of the study, discourse analysis method, classification and systematization method, quantitative analysis method followed by a qualitative interpretation of the obtained data were used.

The discourse analysis is an integrated field of knowledge that studies both oral and written text (VAN DIJK, 2007), wherein the text is a particular aspect of a broader concept – of discourse. The concept of discourse, in addition to the text concept, includes mental processes and the sociocultural context, which allows a researcher to apply a complex approach to studying the features of text generation and perception from different spheres of communication.

Discourse should be understood as texts in indissoluble connection with the situational context, in combination with social, cultural-historical, ideological, psychological and other factors, with the system of communicative-pragmatic and cognitive purposes of the author interacting with the addressee, which determines the special ordering of linguistic units on different levels during its embodiment within the text. Discourse characterizes the communicative process leading to the formation of a certain formal structure – the text.

Thus, discourse analysis assumes the consideration of text from various positions: not only from linguistic, but also from psychological, sociological (text as a product of society, a particular social group), and culturological. Therefore, not only the linguistic means used in a certain text but also the situation of text pronunciation/writing are important for discourse. Discourse analysis includes the stage of text analysis from a formal point of view (lexical, grammatical, syntactic means), the stage of the relationship between the text and its interpretation (movement from text to discourse), and the stage of analyzing the impact on the discourse of various contexts.

The method of discourse analysis has allowed that the visualization of the Spanish scientific texts in form of pictures is emphasized to understand and justify the concept of semiotic substance, characterized by the phenomenon of textual heterogeneity achieved by the combination of verbal and non-verbal semiotic systems.

When studying the scientific text from the position of text formation linguistic theory, the integration of text linguistics with the stylistics of

figurative means and with the functional stylistics that deals with text typology is perspective. In discourse theory, the term “text space” is important. The text space is defined as the set of intersecting discourses that serve as a source for text generation.

From the analysis of scientific texts, it follows that a scientific text reflects the very principle of cognitive activity and its features, conditioned by the subject’s conscious attitude not only to the object but also to his/her creative activity. The object of cognition shall be understood as a fragment of reality transformed into scientific knowledge. Moreover, even if the author focuses on presenting the information about the object of cognition, the author’s self-disclosure invariably happens as a subject of cognition. Therefore, the subject of the speech is realized in the text as a factor influencing the selection and use of linguistic units, the construction of the text and the nature of scientific speech.

The flexibility and mobility of the scientific text boundaries, the deviation of the produced text structures from the accepted standards is a necessary condition for successful communication in human society in its diverse situationally conditioned manifestations. The norm suggests variants because it is alive. “In order for something to live you need a reserve of irregularities, options, recurrences, and deviations” (LOTMAN, 2005, p. 292). This is a necessary consequence of the creative anthropocentric nature of communication. The phenomenon of creativity is revealed when analyzing the text activity of a specific subject of the speech, in particular, in its choice of diverse models of text structures and features of their integration.

A discourse-interpretational method of text analysis and a descriptive method used for all areas of research of the scientific text and scientific discourse have been used as the basic research methods with the use of such techniques as observation, comparison, interpretation, generalization. When analyzing the material, traditional methods of language research have been used in the work: a qualitative method of data processing and a quantitative method.

3 Findings and Discussion

3.1 Epigraph as an Aesthetic Element of Scientific Text

The analysis of the relations within the system of “epigraph – text under epigraph” leads to an understanding of the epigraph as the most important means of expressing the author’s image. When choosing an

epigraph, the author's "I" manifests itself, testifying to the author's literary tastes, associations, thesaurus, and relation to the epigraph content and to its creator. The author of a scientific text, relying on the intertextual competence in the literary and artistic field, can successfully use quotations from other discourses for the purpose of pragmatics (DOLZHICH; MRACHENKO; SOKOLOVA, 2017, p. 374).

In a scientific text, the epigraph, being hardly probable, is perceived as a technique adopted from fiction and therefore has a strong effect of influence serving an aesthetic purpose in beautifying the scientific text.

A feature of the spatiotemporal organization of Spanish scientific works is the presence of such extratextual space as an epigraph in the majority of them (regardless of the field of knowledge).

Using the elements of appraisal, of individual nature in the texts of scientific discourse evokes a keen interest in the reader, makes the scientific presentation more interesting. Analyzing the texts of dissertational works and scientific articles aimed at gaining attention, interest, and respect for the work, convincing the reader in the research originality confirmed this idea of the functions and forms of the scientific discourse.

Benayas del Alamo (2013, p. 176), a lecturer at the Department of Ecology of the Autonomous University of Madrid and coordinator of the PhD program, in his work "Recommendations for Writing Theses", recommends that each new chapter of thesis should start with a quotation of a well-known author, "It is usually interesting to start each chapter with a quotation from a relevant author".

In the process of studying Spanish scientific works, following categories of epigraphs in accordance with their belonging to a particular discourse: modern scientific discourse, philosophical discourse, poetic discourse, religious discourse, colloquial and everyday discourse.

3.1.1 Modern scientific discourse

The epigraph in this case is a statement of an authoritative scientist:

"There is not one correct way to do ecology. Mathematical models, model ecosystems, field manipulation experiments and the search for large-scale patterns are all valid approaches, and all have their strengths and weaknesses" – John Lawton; "It is humans that need managing, not the planet" – David W. Orr (BARRASA GARCÍA, 2007, p. 315).

It should be noted that the inclusion of an epigraph in English reflects the interaction of worldviews within the universal cognitive space.

The compressibility of the epigraph determines its synthesizing function with respect to the main text. The synthesizing function of the epigraphs under consideration consists of the fact that the selected elements are the main indicators of the meanings contained in the subsequent text, about which the epigraph first informs the reader, thus influencing its interpretation. The epigraphs under consideration with respect to the subsequent text perform an eidological (ideological-thematic) function since their main idea makes the recipient think about those issues that the author of the scientific work further raises.

3.1.2 Philosophical discourse

Aphorisms, sayings of ancient thinkers are used as an epigraph, for example:

“La vida es corta, el arte largo la decisión difícil y la ocasión fugaz” – Hipócrates / “Life is short, art long, opportunity fleeting, experience treacherous, judgment difficult”; “Es agradable ser importante, pero más importante es ser agradable” – Seneca / “It is pleasant to be an important person but it is more important to be a pleasant person” (LLAMAS GONZÁLEZ, 2007, p. 7);

“Si consigo ver más lejos es porque he conseguido auparme a hombros de gigantes” – Bernard de Chartres / “We are like dwarfs on the shoulders of giants, so that we can see more than they” (VALLESPÍN GARCÍA, 2008, p. 5);

“El agradecimiento es la parte principal de un hombre de bien” – Francisco de Quevedo y Villegas / “Gratitude is the main part of a good man” (ZAMORA CAMACHO, 2015, p. 11).

3.1.3 Poetic discourse

Fragmentary quotes from poetic texts-sources are introduced into a scientific work: “Caminante, no hay camino, se hace camino al andar” – Antonio Machado (SEOANE PINILLA, 2004, p. 57) /

Wayfarer, the only way
Is your footprints and no other.
Wayfarer, there is no way.
Make your way by going farther.
By going farther, make your way.

The quotation from the poetic work by the emperor of the Chichimeca people, integrated into the text of the thesis devoted to the method of analyzing archaeological finds in the territory of Mesoamerica with the help of an ion beam, unexpectedly violates the rigidity of the material presentation and animates the highly specialized language of scientific work:

What shall I take with me?
Will I let nothing behind me over the earth?
How shall my heart act?
Is it that we come in vain to live,
To sprout over the earth?
Let us leave at least flowers,
Let us leave at least songs –
Nezahualcōyotl (CALVO DEL CASTILLO, 2007, p. 5).

Due to the choice of the Nezahualcoyotl anthem as an epigraph, the dialogical relationship is established between the past and the present. In accordance with the author's intention, the past and the present enter into a dialogue through fragments of their discourses.

Due to the interaction of texts, i.e. intertextuality and wider – interdiscursivity, the reader-interpreter, while comprehending the content of the scientific text, will mentally return to the epigraph to analyze the presented results of scientific research through the prism of the eventual and sociocultural context of the utterance used as an epigraph. The stylistic coloring of emotional elements in the scientific literature is particularly contrasting on the general background of logical, objective forms of evaluation, the qualification of objects and phenomena of the material world.

By cognizing the world, a person reflects it in its mind. Language tools form this creative attitude of the author of a scientific text to reality.

3.1.4 Religious discourse

Here is an example of how the Biblical intertext acts within a scientific work. One of the articles published in the scientific journal on the Geography

of Alicante University has a quotation-epigraph from religious discourse along with quoting a Spanish philosopher and writer Jose Ortega y Gasset:

“La verdad os hará libres” – Jesús de Galilea, según el Evangelio de San Juan, 8, 32 / “The truth will make you free” – Jesus of Galilee; “Estamos entregados a nosotros mismos; nadie nos protege ni nos dirige. Si no tenemos confianza en nosotros, todo se habrá perdido” – José Ortega y Gasset / “We are surrendered to ourselves; No one protects or directs us. If we do not have confidence in us, everything will be lost” (AYALA-CARCEDO, 2004, p. 110).

In this case, the parallel inclusion of quotations from religious and philosophical discourses is completely justified, since, in the reader’s proposed scientific article, the author tries to find out whether there is a contradiction between religion and science in views on the Great Flood. The Bible is a whole world of ideas and images, an entire organism that absorbed many traditions. Its criticism or acceptance means scientific research. To solve this problem, a comparative analytical method is used. It consists of the analysis and comparison of biblical texts with modern scientific data. Using a quote from the philosophical discourse, the researcher emphasizes its desire for a rational perception of reality. The meanings contained in the text of the epigraph agree or contradict with the meanings of the following text, which is a special technique used by the author of the article, who thus affects the reader’s consciousness, opposing, in the framework of interacting texts, the opinions and events expressed and occurred at different times, but entering into dialogical relations.

Thus, the relationship between the text and its epigraph can also be viewed from the standpoint of hermeneutics. The hermeneutics of an epigraph means two aspects of its interpretation. It must be understood as a quotation, as part of a precedent text, i.e. be interpreted as a hermeneutic object. Secondly, it interprets the text that it precedes, i.e. is the subject of interpretation.

In the works of Spanish scientists, a creative approach to the description of research, vivid expression of the author’s style, emotionality and imagery of the presentation, the use of humor and irony elements are distinguished.

3.1.5 Colloquial and everyday discourse

It is possible to highlight another category of epigraphs relating to colloquial and everyday discourse. The thesis study on biology devoted to the forecasting of the flightless birds' habitat, revealed the following inserts from the above discourse:

“Facts are facts, but perception is reality: – Conventional political wisdom”; “¡.Mírale!, y por eso le pagan... – Alejandro (primavera de 1998), un amigo almeriense cuyas palabras son el eco de la sociedad en la que vivimos; un eco que yo no puedo – ni creo que deba-quitarme de la cabeza” / “Look at him!, and that's why they pay him” (SEOANE PINILLA, 2004, p. 78, 112).

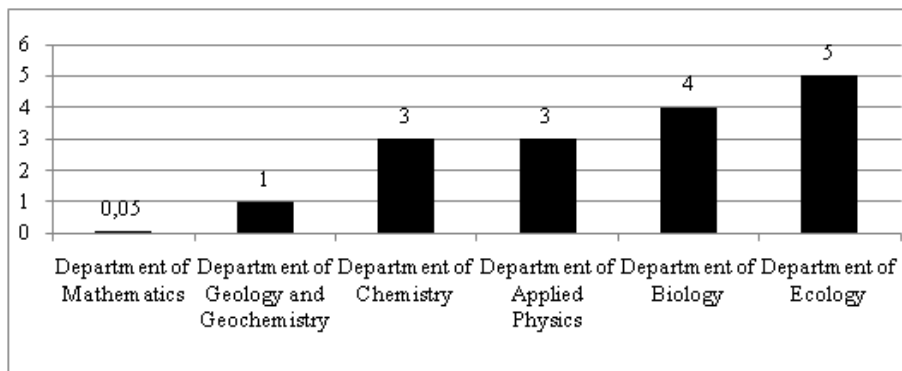
Further, let us cite as an example the epigraph to the thesis on physics, which is a well-known ironic utterance of the American physicist, Nobel Prize winner Richard P. Feynman: “Physics is like sex: sure, it may give some practical results, but that's not why we do it” – Richard P. Feynman (JIMÉNEZ VILLACORTA, 2007, p. 5).

Thus, the scientific discourse explicates personal coordinates of the author's speech subject, who leads a dialogue with an intended addressee. The author's interpretation activity is reflected in the structures of someone else's speech. This activity is aimed at reproducing the author's appraisal positions.

Epigraph gravitates to the status of a mini-text, a “text within a text”. It functions as a separate structural unit, an independent statement and, being withdrawn from its former context, is graphically highlighted in the text of scientific work. In some cases, the separation of the epigraph from the author's text is underlined by printing means, for example, in a different font. The epigraph is a complete fragment of the text, which has a definite meaning.

In the analyzed texts of 50 theses, 35% of scientific works featured epigraphs, the main part of which fell on theses defended in such fields of knowledge as ecology, physics, and biology. None of the theses on mathematics had an epigraph (FIGURE 1). In 50 scientific articles, epigraphs are practically absent, only two epigraphs have been revealed from the total volume of the material.

Figure 1 – Frequency of epigraph inclusion into the theses



Source: The authors.

3.2 Pictures as an Aesthetic Element of Scientific Text

3.2.1 A polycode text

Polycode text is a clear manifestation of textual heterogeneity at the level of form, achieved through the connection of various semiotic systems. Polycode scientific texts are the result of the interaction of discourses. A polycode text focuses on the fact that different codes interact, that is, systems of symbols and signs to process and store information in the most appropriate form. In this sense, the phenomenon of polycode text is directly related to the manifestations of interdiscursivity.

A semiotically complicated text, in which the author's intention is realized using both a verbal code and non-verbal means, indicates a serious change in the ways of transmitting information about the world.

Functioning in a single semantic space the verbal and non-verbal components ensure the integrity and communicative effect of the polycode text. While the recipient perceives a polycode text, double decoding of its information occurs and the fullest text concept is created.

The author of a scientific text as a linguistic personality is the carrier of individual linguistic ability, ensuring the production of his/her texts, expressing ideas, meaningful values and assumptions necessary to solve a significant problem. As Karaulov (2010, p. 36) stresses, the linguistic personality is “a set of abilities and characteristics of a person, which determine the creation and perception of speech works, which differ in the degree of structural and

linguistic complexity, depth and accuracy to reflect the reality, determined by the goals". He emphasized that one of the structural levels of a linguistic personality is the cognitive level including linguistic personality's notions, ideas, concepts and thesaurus which represent his/her ordered picture of the world, reflecting a hierarchy of values.

3.2.2 Cognitive approach in a scientific text

The cognitive approach contributes to the identification of the essential properties of a scientific text that go unnoticed when considered in the framework of other scientific paradigms. Under the cognitive approach, it is possible to consider a scientific text as a heterogeneous cognitive structure that allows representing and processing information. Knowledge is recorded in a scientific text with the help of a language, and the recipient using language units decodes the knowledge encoded in the text. But, considering the text in the cognitive paradigm as a system, it becomes obvious that a scientist can comprehensively represent knowledge not only through the verbal but also by non-verbal components. A multichannel source of information provides its better perception. Under the cognitive approach, a polycode text appears as a poly symbol fixation of mental representations of reality perceived by the author, who being a linguistic personality chooses the individual way to present findings in accordance with his/ her sociocultural experience.

So the specificity of the Spanish scientific texts consists of integrative structural-semantic and the functional whole of verbal and non-verbal elements that carry a pragmatic purpose to inform the recipient and influence his/her mental and psycholinguistic processes.

The scientist obtains knowledge of the world both in direct dialogue with this world, using rational logical or aesthetic methods of its cognition, and in dialogue with the semiotic space of culture. To illustrate thoughts, the author of scientific text resorts to pictures captured in literary and artistic discourses. The mention of the names of biblical, mythological and literary heroes, accompanied by intertextual inclusions in form of images, demonstrates the deliberate switching of consciousness to the pictures of the world created in the myths and classical works of the world culture. In such cognitive switching, the author sees an effective way of visual figurative explanation of abstract concepts involved in his/her scientific concept.

3.2.3 Examples of visual explanations of abstract concepts

The integration of “The Mad Hatter’s Tea Party”, a scene from Lewis Carroll’s “Alice in Wonderland”, illustrated by Sir John Tenniel into the text of highly specialized content on mercury properties is of particular interest (FERNÁNDEZ MARTÍNEZ, 2006, p. 21). The relation of Lewis Carroll’s character to the text with a highly specialized content on the properties of mercury is obvious to the prepared recipient. The Mad Hatter suffers from mercurialism because hatters were forced to inhale mercury vapors during the manufacture of felt and often suffered from mercury poisoning; mercury vapor damaged the nervous system, causing symptoms such as confused speech and distortion of vision.

In the same thesis on the properties of mercury, the historical background contains engraving “The Emerald Tablet of Hermes Trismegist”, the document left by Hermes Trismegistus on an emerald plate in the depths of the Egyptian temple, according to legend (FERNÁNDEZ MARTÍNEZ, 2006, p. 28). One of the most common versions of the “Emerald Tablet” interpretation states that it contains a recipe for the alchemical “Great Work”, that is a recipe for making a philosopher’s stone. Thus, using cognitive switching to other types of discourse, textualization is obtained by concepts stored in the cultural memory of a scientist, formed in artistic discourse or other discursive formations that represent pictures of the world that are different from the scientific ones.

Vallespin Garcia (2008, p. 11) uses a picture of the Italian painter Federico Barocci “Santa Lucía”, an early Christian Saint and Martyress, Patroness of the blind in her thesis about congenital blindness.

In the scientific article on geography, devoted to the analysis of the events of the Great Flood, paintings by Gustave Dore (1832-1883) “The Flight of Lot from Sodom” and “Noah’s Ark” are presented. The author uses these pictures primarily for aesthetic purposes to make the text more attractive and embellished (AYALA-CARCEDO, 2004, p. 115).

The author of the European Ph.D. Dissertation on assessment of arsenic occurrence, Ardilla (2012, p. 4) includes the Portrait of a Victorian Woman by Dante Gabriel Rossetti referring to the Victorian era, when arsenic (the “white arsenic” form, the arsenolite mineral, As_2O_3) was mixed with vinegar and chalk and eaten by women to improve the complexion of their faces, making their skin paler to show they did not work in the fields. Arsenic was also rubbed into the faces and arms of women to “improve their complexion”.

Ardilla (2012, p. 5) also remembers about the use of arsenic as a poison in novels and films and inserts in her dissertation the cover of the book "Under Milk Wood" by Dylan Thomas. Also, she quotes from the book: "For instance, when in his play "Under Milk Wood" (Bajo el bosque lácteo in Spanish), the Welsh poet and humorist Dylan Thomas created the henpecked husband character of Mr. Pugh, a man whose favorite reading was drawn from "Lives of the Great Poisoners", it was clear that the poison of his fantasies was arsenic (...whispering as he took breakfast tea to his wife's room: "Here's your arsenic, dear. And your weedkiller biscuit... Here's your ... nice tea, dear").

Thus, by cognitive switching to other types of discourse, scientist's concepts formed in literary and other discourses representing pictures of the world that differ from the scientific one obtain their textual actualization. The author's intention for using such kind of intertexts stored in his/her cultural memory is not to provide the reader with additional information on the subject of the research or to inform the recipient of the author's opinion on the quoted fragment, but to enrich the work with additional associations, to embellish it and give its distinct identity. It allows a scientist to find for the created text its place among other scientific works.

It should be noted that the multi-dimensional view of the text as a polycode structure is the result of polycode nature of human communication. The aestheticization of communication should be called as its obvious tendency manifested in enhanced visualization of the communicative message.

4 Conclusions

As seen from the above, intertextual relations in a scientific text perform not only appellative, contact, evaluation and etiquette functions. The aesthetic function of intertextual links in the scientific discourse is most noticeable. Intertextual borrowings like epigraphs and pictures taken from the discourses different from the scientific, embellish the scientific text, give it an individual character and soften the rigorous style of a scientific presentation. The author's aim is not only to express his/her ideas on paper and report them to the recipient but to give them an attractive text form.

The inclusion of images from the literary discourse is considered a phenomenon of the author's cognitive shift on the picture of the world created

in the myths and classic works of world culture. In such cognitive switching, the author finds apparently effective way of visual-figurative explanation of abstract concepts involved in scientific work. Such borrowings from other styles, genres or areas of knowledge fall out of the general tone of presentation of highly specialized material, and, therefore, attract the recipient's attention and highlight the research paper in common information space contributing to the aestheticization of the scientific message.

Intertextuality and interdiscursivity in the intertextual analysis apply to the field of specialized discourse, where the confluence of different types of knowledge, various perspectives of a phenomenon and different possibilities of approaching it according to the professions or interpretive communities arises. In professional discursive chains and communicative activities that the scientific problem statement and personal experiences are being recontextualized. This process involves the recycling of previous knowledge, as well as the interpretation of new meanings.

The method of discourse analysis has allowed that the visualization of the Spanish scientific texts in form of pictures is emphasized to understand and justify the concept of semiotic substance, characterized by the phenomenon of textual heterogeneity achieved by the combination of verbal and non-verbal semiotic systems. The study of intertextuality and interdiscursivity is one of the most promising areas of linguistics both in theoretical and practical terms since it has a direct approach to the actual problems of the cultural level of the society. The present study would promote further research on the topic.

Authors' contribution

The two authors have contributed equally to the preparation and writing of the text.

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