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ASSOCIATIVE COLOR OF INDIVIDUAL LEXICON CORE UNITS: PSYCHOLINGUISTIC APPROACH

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Abstract

The article presents the psycholinguistic experiment results, which will write additions to the study of the language world view in the context of modern transformations and to the description of the image systemacity of the Russian language consciousness. A brief excursion into the study of the language consciousness core is proposed with the basic term definitions used by the authors. The article demonstrates the use of one of the computer programs created on the basis of the Ufa Psycholinguistic School under the guidance of Professor Rogozhnikova. The capabilities of the computer product BARIN allow us to carry out the comparative analysis of the associative field structures. The work also provides statistical information regarding the vowel percentage of the sound letters not only in the core of the Russian language consciousness but also in the associative fields for stimulus words according to the criteria for their distribution in the language and text. Using the program for automated text analysis, the leading associative color of individual lexicon core units was determined, as well as the color of its peripheral zone. The integrated approach to the research involves the most complete study of the stimulus series that make up the "core" space. The results obtained during the formalization of the processes of encoding and decoding the sound-color potential of individual lexicon core units make it possible to process a large volume of speech activity products, ensuring the reliability of the conclusions obtained.

Keywords: Associative experiment, associative color, computer text analysis, individual lexicon core, language consciousness, world view

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1. Introduction

In the modern science of language the researches on revealing the specific nature and describing the image of the Russian world are paid much attention. At the same time the associative thesaurus presented in the form of a multidimensional associative network gives a clear idea of the structure and functioning of the language consciousness of the “average” native speaker of a particular language, and thus of its image of the world. A special role in this kind of work is given to words belonging to the lexicon core units i.e., those units of the semantic network that have the greatest number of connections with other units of this structure. The term “individual lexicon core” appeared in the literature in the last century and denoted a limited number of units in the space of the mental lexicon, but these limited number of units has the maximum of associative connections. A lot of experimental works were conducted by Tarasov (2000); Zalevskaya (1981); Zolotova (2004; 2012; 2014). Hypothesis regarding the structure and content of the lexicon core stated by Zalevskaya was confirmed by materials obtained by Kish – the author of the "Associative English Thesaurus". So, we can see that different authors doing their research came to the consensus about human lexicon and their researches complemented each other (Zalevskaya, 1999), though they may use different terms.

2. Problem Statement

The data of allied sciences provide linguistics and psycholinguistics with powerful auxiliary tools for studying mental processes associated with a basic level of intelligence. Color is one of such tools without which the study of intelligence is impossible. The computer programs BARIN, BURGER, BATYR, SCHETOVOD created on the basis of the Department of the Language Communication and Psycholinguistics of Ufa State Aviation Technical University have different purposes (Kochetova, 2013; Rogozhnikova, 2017; Yakovleva, 2015; 2016).

It is well known that color affects not only a person’s ability to perceive reality in all its coloristic richness, but also on the systems formation with symbolic significance. Color becomes the central category of both the conceptual and the language world view, correlated with the semiotic and value world view of a particular national culture. This allows us to talk about “color preferences”, “ethnic color mentality”, “color gaps and universals”, that is, about the “color world view”. Hence, color designations are one of the most important elements of the language, representing complex categories, multidimensional formations (Salikhova, 2019).

Sound-color associativity of the speech sounds perception, color patterns of text organization, the significance of the phonetic meaning of a word – all these questions are of particular researchers interest and the use of computer programs will answer many of them.

3. Research Questions

The BARIN software product that we use for automated word and text analysis was developed in 2011 by a team of authors (project manager Rogozhnikova, programmer Voronkov, associate professor Efimenko, and graduate studentnYakovleva). While creating the program, the researchers constructed and

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described the color matrix of the sound letters of the Russian language (Efimenko, 2018). The computer program is a combination of several modules: interface module; general module for text analysis, involving work with any written text in Russian or English; modules for dynamics determining of the color content of the text and the spiral model construction of the color image of the text; module of artistic and computer interpretation (artistic image) of sound-color correspondences in the text; statistics module.

It should be noted the scientific and practical potential of this program: it allows researchers not only to calculate the frequency of the sound letters of Russian and English texts, to display the results in a tabular format, but also to determine the color content of the text based on the calculated frequency of the sound letters, illustratively present the results in graphs and charts, and perform artistic interpretation of sound-color correspondences in the text with saving to a separate file.

4. Purpose of the Study

The BARIN program was used to implement the following aims: to compare associative fields obtained as the result of the psycholinguistic experiment in which the units related to the language consciousness core acted as initial verbal stimuli; to study the text comprehension difficulties by using the same stimulus words as in the first stage. Of course, color does not function as an independent cognition tool and does not exist as an independent expressive means, therefore the color symbolism is affirmed to be the delivery vehicle of a certain idea, to have "connate" metaphorical potential. Color belongs to the symbolic core of ethnoculture due to its semiotic status and ethnocultural significance and capacity. The color symbol in the national cultural meaning is able to participate in intercultural communication, introducing an additional explanatory element into it, which facilitates understanding. In the color ambivalence, in our opinion, its figurative verbal interpretations are hidden, which are manifested in various kinds of associations under the conditions of a psycholinguistic experiment.

5. Research Methods

The following are used in the work: a) methods of generalization, systematization and statistical data processing of free associative experiments in verbal form with native Russian speakers; b) a comparative method for checking the array of data obtained; c) the method of thesaurus knowledge in linguistics, which, in conjunction with others, including computer methods and specific methods of analysis can be used in other studies of linguistic ways of the knowledge existence; d) mathematical methods for recounting texts with the derivation of the extracted statistical information of a particular analyzed text and the development of a module for recording and reading an associated database, graphical interpretation of data.

The associative field is connected with the concept of "associative meaning of a word", which, according to Zalevskaya (1999), was formed during the search for a specific internal structure. Such an in-depth model of connections and relations underlies the "cognitive organization" of a person's experience and can be revealed through the associative link analysis of a word. Universal mechanisms and connections operating at the word / text level retain their specificity at the level of color and / or

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sound. A look at the associative field as a text in the stimulus-reaction binome neutralizes the traditional distinction between “paradigmatic” and “syntagmatic” reactions and allows them to be interpreted as the influence of the associative environment (term of Rogozhnikova). Daminova (2018), in her research, found that in the process of association the associative environment passed or is passing through the associative-verbal network of the subject. During a psycholinguistic experiment responding to the stimuli a native speaker foregrounds known texts by “stimulating prediction” (Karaulov).

According to the results of the study, it is supposed to calculate the ratio of "core" reactions to "core" stimulus words, to represent the frequency of the sound letters of each associative field in comparison with the frequency of the sound letters of the language consciousness core, graphic design of the color spiral of the language consciousness core with highlighting the leading color in it.

6. Findings

Following in the footsteps of Leontiev, Alefirenko (2010) in the theoretical concept we hold by the opinion that the language view of the world is a more voluminous concept than the world image. These concepts are differentiated by us only for scientific purposes. The main difference between the language view of the world and the world image is that the first reflects the world cognizable by an ethnic group, creating a visual representation of its realities, and the second is the result of the conceptualization of the worldview categories of ethnic culture. The world image is primary, since it is objectified not only by language, but also by other sign systems, including color and sound. In addition, it has an inherent explanatory function. We qualify the language world view as a ready-made construct with an inherent (world view) ascertaining function. We should emphasize that the interaction between reality things images and new associations and meanings arising on their basis is a great driving force. It promotes the world image configuration changes, expands the world view, which means that its frame, i.e. world image changes. We also note that the world image is not a combination of only perceptual images and cannot be interpreted as a visual picture. It mediates human interaction with the ontological world through a combination of information and knowledge.

The associative field is an ordered and structured information in the form of a lexical entry. All information obtained from our testees was structured according to the Russian Associative Dictionary (Karaulova et al., 1994). A certain number of digits is given at the end of each lexical entry and they carry complete statistical information about this field. Given the fact that there were 100 testees during each stage of the experiment the first digit (100) shows the total number of responses to the stimulus word. There are a lot of different responses, so we should indicate the total number of different reactions – it will be the second digit. Sometimes the testees don’t want (for various reasons) answer – the third digit indicates the number of such omissions, and the fourth one is the number of individual reactions. As an example, we consider the content of an entry compiled on the stimulus word HUMAN.

HUMAN: *life 10; personality 8; lively 7; individual; creature 6; feelings 5; mind; reasonable 4; kind; "Evil" for nature; society; a family; mind; good; I am 3; mutual assistance; friend; soul; love; communication Work; body; smart 2; greed; anatomy; close; God; mountain; humanoid; house; female; animal; a riddle; self-interest; beautiful; brain. 100 + 36 + 0 + 13*. So, the total number of testees is 100, the total number of different reactions is 36, there were no omissions, the number of individual reactions is only 13. Such form of experimental data presentation in the associative dictionary allows us to study

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not only the similarities and differences in the consciousness images content of the member of this culture, but also to reveal the systematic image of the world of a given culture.

Materials are convenient for comparison and analysis because they are the result of a mass experiment, which allows the researchers to use them as a source of linguistic and psycholinguistic information. The participants in the experiments as a rule belong to various speech communities within the nationwide speech community. In addition, you can ignore all those signs that are not typical of the ordinary representative of the speech communities. We should also mention the importance of the fact that these materials can form specific “associative profile” of consciousness images (lexical units), and this “associative profile” will be specific for a given language and culture.

Comparing the associative fields of stimulus words that make up the language consciousness core we noticed that some of the reactions were also included in the core. In particular, the HUMAN stimulus generates (as a reaction) a word related to the language consciousness core – LIFE, and the rank of this word is also high – (3). As the table 1 shows the stimulus word of the first rank has the most "core" reactions, i.e., reactions belonging to the language consciousness core. All other words have approximately the same number of such reactions.

Thus, the analysis of the associations obtained in the associative experiment allows us to determine the specific characters of the consciousness images of the participants which were young people from 17 to 25. Using the BARIN program, we were able to calculate not only the frequency of the sound letters of each associative field, but also the frequency of the sound letters of the language consciousness core. For convenience the words in Table 2 are presented by the rank number corresponding to one or another stimulus word, for example, the number 1 – for the associative field per stimulus word HUMAN, 18 – respectively – WATER, etc. The designation "I" is given for the language consciousness core. All figures are presented in percentage terms.

Table 1. Correlation of “core” reactions to “core” stimulus words

Stimulus word	Number of reactions belonging to the core of linguistic consciousness
HUMAN	10
WATER	3
BUSINESS	4
MACHINE	5
GIRL	6
WAR	4

Table 2. Frequency of the sound letters of each associative field with the calculation of the particular sound letters of the language consciousness core (or individual lexicon core)

Sound letter	Text Frequency							Language frequency						
	Я	**1**	**18**	**22**	**41**	**49**	**73**	**Я**	**1**	**18**	**22**	**41**	**49**	**73**
[о]	11.36	12	13.83	12.15	10.76	9.62	11.11	11.2	27	39	48	48	30	25
[е]	8.59	3.56	5.32	11.14	10.31	6.09	6.22	8.48	8	15	44	46	19	14
[а]	6.82	7.56	9.22	7.85	| 6.5	12	10.22	8	17	26	31	29	39	23
[и]	4.29	7.56	6.38	4.05	5.61	4.81	6.67	6.56	17	18	16	25	15	15
[у]	2.27	4	1.77	2.03	3.36	2.88	3.11	2.49	9	5	8	15	9	7
[ы]	2.02	0	1.06	0.76	1.35	0.96	1.33	2.04	0	3	3	6	3	3
[я]	1.01	0	3.9	1.52	1.35	4.81	4.44	1.98	0	11	6	6	15	10
[ю]	0.25	0	0.35	0	0.45	1.6	0	0.61	0	1	0	2	5	0
[э]	0	0	0	0	0.45	0	0	0.38	0	0	0	2	0	0
[ё]	0	0	0	0	0	0	0	0.06	0	0	0	0	0	0

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Automated text analysis using the BARIN program allows you to build a color spiral. It displays the associative color of the words that make up the core of the language consciousness (Figure 1).

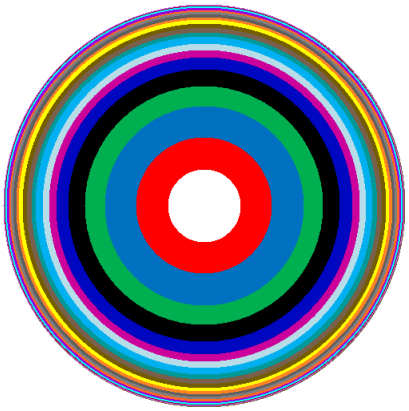

Figure 1. The color spiral of the language consciousness core

The spiral structure is a combination of core and peripheral zones. The core zone is painted in the leading color, which is formed due to the color of the letters with the highest percentage frequency in the text. The colors of rare and single reactions make up the color of the peripheral zone (Figure 2). So, for the first time, data on the structure of the color space of the language consciousness core were obtained. The study of color semantics of the core units of the language consciousness gives us new knowledge about the process of developing associative color meanings.

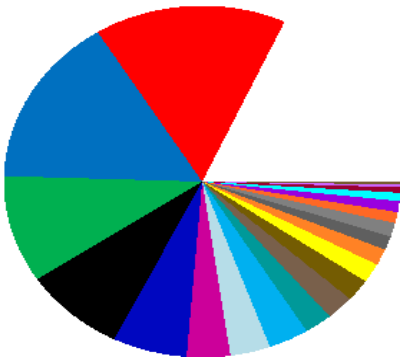

Figure 2. The leading color of the language consciousness core

7. Conclusion

Thus, the research perspectives of the sound-color resources of text patterns allow us to reach a higher level of theoretic interpretation and practical use of the influencing “power of the word”, which can be measured and evaluated. Organized relations between objective reality, its mental reflection and world views are revealed through different sign systems and means, primarily through language (language world view), sound and color. In the context of a globalizing world, there is a transformation of the language world view and mentality in general. Such transformation consists of the perception identity of the same concepts by the members of different ethnic cultures, which leads to the discourse emergence on global language identity. The invasion of color semantics and color impact opens up new possibilities

in modeling the color climate of discourse. The study of the semantic component of this problem allows us to identify universal and specific features of the process of developing color values, which makes it possible to improve the text patterns in order to increase its information content.

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