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COLORS OF HEALTH AND SICKNESS: SOCIOCULTURAL RESEARCH OF ASSOCIATIVE CONNECTIONS

Целью исследования является анализ хроматического образа концептов здоровье и болезнь, визуализация полученных цветовых ассоциаций и их культурологическая экспертиза. Исследование проводилось методом эксперимента, инструментарий которого был апробирован в ходе пилотного этапа в Швеции и Непале. Участники эксперимента должны были найти наиболее подходящие цветовые ассоциации для предложенных понятий. Палитра эксперимента содержала 27 цветовых образцов, разработанных с помощью системы естественных цветов (NCS). Все цветовые образцы предъявлялись каждому участнику эксперимента одновременно на светло-сером фоне в условиях естественного дневного освещения. В исследовании приняли участие 100 русскоязычных респондентов (36 мужчин и 64 женщины) в возрасте от 17 до 80 лет (средний возраст – 23,73). Никто из участников не испытывал проблем с восприятием цвета и цветоразличением. Наиболее устойчивые ассоциации с тоном для понятия здоровье были выявлены в зеленой, оранжевой, желтой и красной частях спектра. С понятием болезнь чаще всего связывали зелено-желтые, желтые и ахроматические оттенки. Цвета здоровья формировались исключительно за счет чистых и светлых оттенков, в то время как среди цветов болезни в основном доминировали темные. Мы зафиксировали отчетливую границу между ахроматическими цветовыми ассоциациями. Все участники, которые связали предъявленные понятия с ахроматическими цветами, ассоциировали здоровье с белым, а болезнь – с черным или серым. Исследование имеет широкие перспективы дальнейшего развития на материале других культур и значительный прикладной потенциал.

Ключевые слова:
болезнь, здоровье, концепт, перцептивный образ, цвет, цветовые ассоциации, эксперимент.

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1. Introduction

Among the leading concepts actively circulating in society, and thus being familiar to the great majority of adherents to Russian culture, are *health* and *sickness*, which denote important indicators of vitality. For this reason, the culture-specific characteristics of these concepts in the linguistic consciousness of Russian-speaking people have frequently been the subject of research studies. Verbalized concepts have been investigated through the use of different methods: examination of vocabulary definitions and key word synonyms, axiologically marked phrases (proverbs, sayings, aphorisms), lexicographical, etymological, conceptual, and collocation analysis (see e.g.: [5; 10; 17; 20–22]).

In some association experiments, when participants were asked to associate a stimulus-word with an arbitrary idea or object, different color terms served as stimuli (see e.g.: [12; 13; 27]). Sometimes the task of participants was quite the opposite: to pair the given concepts using color terms as reaction-words. Such studies revealed strong connections between concepts and separate color terms. However, the obtained results were rather uncertain in terms of visual color characteristics.

In a number of experiments, stimulus material consisted of color samples, but in these studies the task was unconstrained. There was no list of concepts, and associations possessed a rather spontaneous character that considerably increased the variability of received answers and, as a consequence, the ambiguity of obtained correlations [2; 24].

The earlier studies of concepts *health* and *sickness* revealed their structure and semantics. However, the perceptive image of both concepts and its visual characteristics remained unclear. Although recent empirical results strongly imply a relationship between both concepts and definite color associations, they are generally confined to their verbal descriptions. Assuming that the basic colors of a particular culture actively connote *health* and *sickness*, we have set a goal to reveal more detailed characteristics of the chromatic concepts, to visualize the obtained color associations and to understand their cultural significance.

Table 1

Color samples of the experiment

	1	2	3	4	5	6	7	8	9
A	S 0300-N	S 0520-Y	S 0520-Y50R	S 0520-R	S 0520-R50B	S 0520-B	S 0520-B50G	S 0520-G	S 0520-G50Y
B	S 4000-N	S 0580-Y	S 0585-Y50R	S 1080-R	S 3055-R50B	S 2065-B	S 2060-B50G	S 1565-G	S 1075-G50Y
C	S 9000-N	S 6020-Y	S 6020-Y50R	S 6020-R	S 6020-R50B	S 6020-B	S 6020-B50G	S 6020-G	S 6020-G50Y

2. Materials and method

Procedure. Data were collected in the course of an experiment that previously was performed in 2015–2016 during a pilot stage in Sweden (N=70) and Nepal (N=77) [25]. The main goal of the experiment was to specify the chromatic images of two concepts: *health* and *sickness*. Participants were asked to match the best suited color associations for the given terms.

Stimuli. The color chart of the experiment consisted of 27 samples (*Figure 1*), selected from the Natural Color System (NCS). It included brilliant shades of four primary colors (Y – yellow, R – red, B – blue, G – green) and four secondary colors (Y50R – yellow-red, R50B – purple, B50G – blue-green, G50Y – green-yellow) (*middle row in Table 1*). Additionally, we included into the chart one light (*top row in Table 1)* and one dark (*bottom row in Table 1)* shade of every primary and secondary color, as well as three achromatic colors – white, grey, and black. Stimulus size was 4 by 10 centimeters. All color samples were presented to a participant at the same time against the neutral mid-grey background under standard daylight illumination.

Participants. In total, there participated in the research 100 (36 males and 64 females) Russian-speaking respondents with ages ranging from 17 to 80 and a mean age of 23,73 years. None of the participants had any problems with color vision.

3. Results

Matrix. The collocation of 27 colors and two concepts composes a 54-cell matrix. The 200 responses of the experiment participants filled in the cells, unevenly distributed. One third from all the matrix cells (18) remained empty: none of the participants connected the provided concepts with a particular color. More than a fourth of matches (12) referred to single instances, since they appeared only by one or maximum two participants and thus cannot be considered relevant. The majority of weak associations lay in the blue region of the color spectrum, described as red-blue (RB), blue (B) and blue-green (BG) shades.

Thus, less than a half (24) from all the matrix cells were of interest for the color association analysis (*Figure 2*).

Two shades of yellow-green (B9 and C9) and yellow (B2 and C2) colors, together with brilliant green (B8) and yellow-red (B3), were selected more frequently than others (>10% of choices).

Associations with hue. Since in modern society we actually deal not just with colors, but with more abstract notions such as hue, shade, brightness or saturation, in the next stage of the research we conducted a detailed analysis for each color component.

The strongest associations with hue for the notion *health* were revealed in green (G) (27%), yellow-red (YR) (21%), yellow (Y) and red (R) (both 14%) parts of spectrum.

The most popular shades connected with the notion *sickness* were green-yellow (GY) (35%), yellow (Y) (17%) and achromatic (N) (15%) shades (*Figure 3*).

Associations with groups of shades. The distribution of associations with every hue in groups of shades showed a curious pattern (*Figure 4*): colors of *health* were formed with the exclusive use of brilliant and light shades (52 and 47% correspondingly), while among the colors of *sickness* dark shades prevailed (59%).

The great majority of participants (88%) chose color shades from different groups to denote the concepts of *health* and *sickness* (*Figure 5*). More than a half of them (57%) matched the terms with the shades from neighboring groups: brilliant (B) – with one concept, and light or dark (A or C) – with the other one. Almost a third of the participants (31%) connected the terms with extremely contrasting shades: light (A) and dark (C).

Associations with achromatic shades. Additionally, we analysed the correlation between the terms and three achromatic colors – white, grey and black (*Figure 6*). Achromatic colors were chosen by a fifth of the respondents (21%). We revealed a distinct borderline between achromatic color associations. All participants who connected the provided terms with achromatic colors, associated *health* with white and *sickness* – with grey or black color.
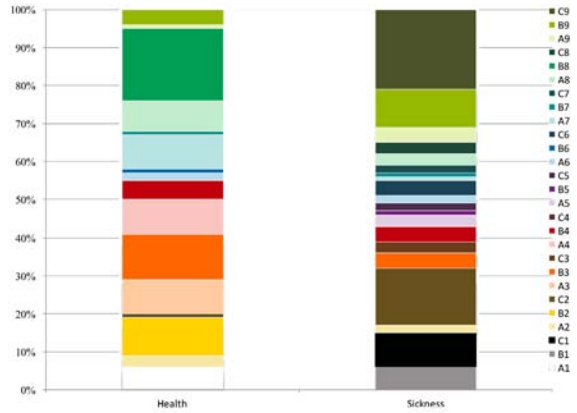
Figure 1. Color chart of the experiment.

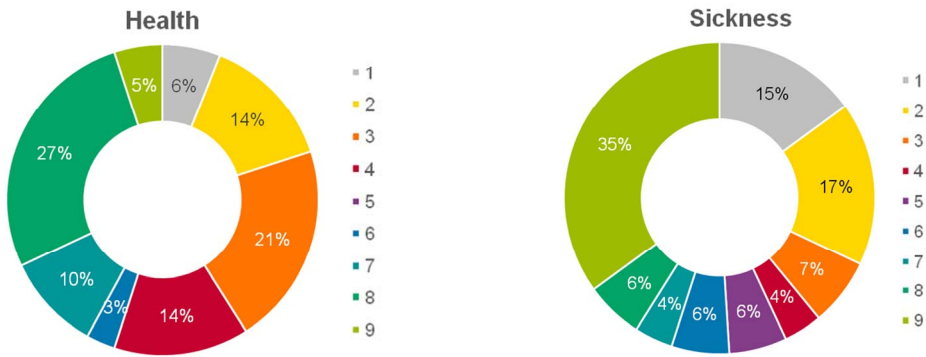*Figure 2. The results of associative connections of shades.*

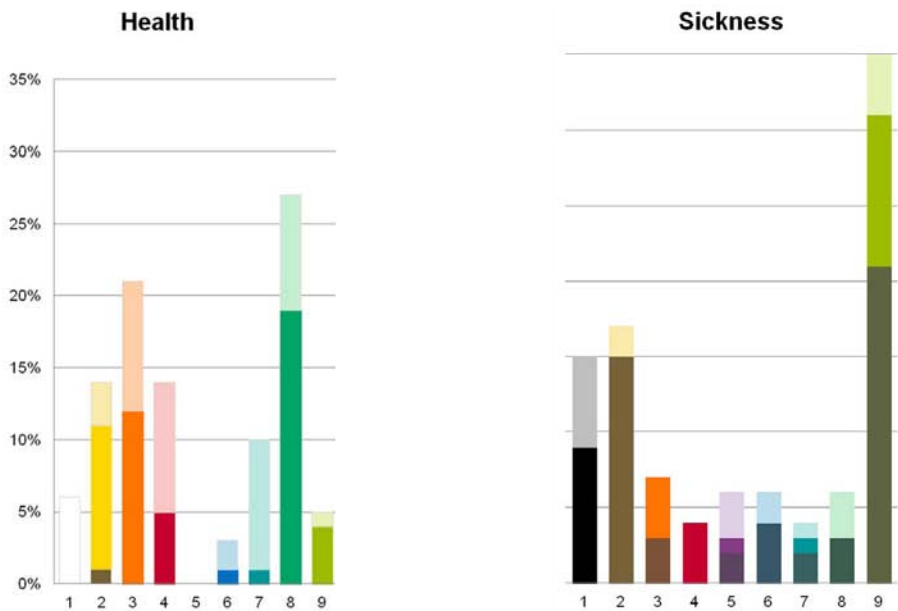*Figure 3. Associations with hue.*

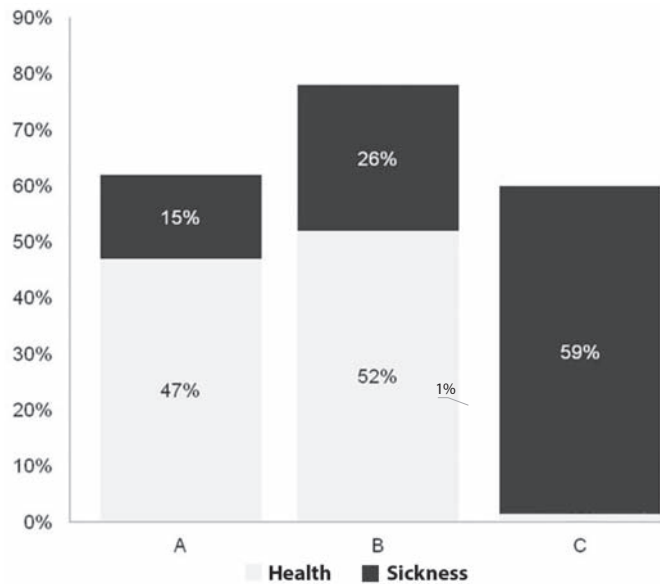*Figure 6. Associations with hue in groups of shades.*

Figure 4. Associations with groups of shades.

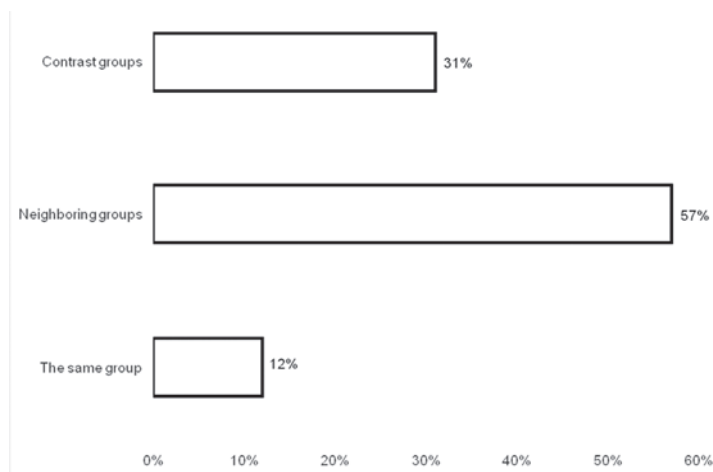*Figure 5. Correlation of groups of shades.*

4. Discussion and conclusion

Associations with hue. The obtained results confirmed previous conclusions about the existence of marked color associations in the structure of the *health* concept.

In particular, as in the psycholinguistic experiment of Petkau with 80 Russian-speaking respondents ranging in age from 18 to 72 years (M=28; F=52) who were asked «What is the color of health?», green appeared in the core of the chromatic image [13, p. 58–60]. The associative connection of *health* with pink, light-blue and white, together with the absence of associations with blue, were also confirmed.

We revealed two cores in the structure of the chromatic image of *health*: in both the «warm» red-yellow and «cold» green parts of spectrum. The revealed color representatives of *health* agree well with the associations found in the research of Kirilenko [6], Okhritskaya [11], Petkau [12; 13], Tuleninova [20; 21], and Yalalova [22], that form a figurative side of the concept.

The domination of green shades is probably caused by the strong associations with a healthy environment, including intact nature, lush vegetation, tree leaves and grass. According to Tuleninova, in the Russian national sphere of concepts, *nature* is one of the most

strongly connected with *health* [20]. *Health* is attributed to a natural, particularly floral, abundance of life. Genuineness and spontaneous naturalness lie behind the traditional *health* concept [6, p. 66–74].

The core of the warm part of the color spectrum refers to the image of a healthy person, who is associated in a naïve worldview with healthy complexion and natural glow. *Health* in Russian unsophisticated linguistic consciousness is mostly connected with a harmonious structure and proper functioning of the human body [12, p. 195; 22]. The connection is reflected in phrases *red as a rose*, *full-blooded*, *blooming*, which are synonymous with the lexical item «health» in dictionaries [11, p. 106–115; 13, p. 37–38; 19, p. 48–50]. This image is chromatically expressed with the help of certain «fleshtones» (see e.g.: [26]): first of all, these are the tints of red, light red-yellow and yellow hues that are easy-to-see in the chromatic image of *health*.

More saturated shades of the yellow-red part of spectrum are most probably connected with the point that in everyday consciousness *health* is also associated with strength, energy, happiness and well-being. These are referred to sun, light and fire, so in a list of synonyms this notion is mentioned in phrases such as *vibrant with health*, *flourishing*, *strong*, *full of strength*, *energy*, *vigorous*, *mighty*, etc. [6, p. 66–74; 11, p. 122–130; 13, p. 39; 19, p. 48–50]. Similarly, *beauty* is expressed in language through floral metaphors such as *fresh as a daisy*, *juicy apple*, *berry*, *flower*, *peach*, etc. [8, p. 613–620; 22, p. 32–36).

Both images are directly interconnected through an idea of original and naturally established bases of *health* and together prove «global anthropocentrism» [19, p. 50] of *health* properties (all of them relate to human being), that, to our mind, explains the absence of associations of this concept with blue and purple colors. The blue of the sky is the least material of all colors [18]. The semantics of blue and purple are connected with «suprahuman» characteristics – divinity, eternity, infinity [11, p. 143–153].

The structure of the chromatic image of *sickness* with the core in the yellow-green part of the spectrum also conforms well with the previous conclusions. In particular, it corresponds to the dual character of cooperation between *health* and *sickness* revealed by examination of verbal representations in the Russian language (data for this study was collected from dictionaries, paremiological reference books, literary and media texts, academic guides, encyclopaedias and other popular science editions, articles from web-sites) [20]. The analysis of an associative field proves that basic concepts connected with *health*, in Russian linguoculture are also relevant to *sickness*. This means, that in the chromatic layer of *sickness* the same images are reflected as in *health* but with a considerable shift to dark shades, associatively connected with dissolution, breakdown, corruption and other destructive processes.

Associations with achromatic shades. Associations with achromatic shades – white, grey and black – were also expected. They primarily reflect evaluative dimensions correlated with *health* and *sickness*.

In common perception *sickness* is an absolute evil connected with the invasion of demonic forces, lack of vital principle, regression to pre-human forms of existence [7, p. 38]. A figurative side of *sickness* represents associations with natural disasters and mythic «demon», because the first efforts to explain sickness and disease had a mythological character. A mythologem of *sickness* – «evil, arising from spiritual (under) world» [20, p. 7–8], remained in folklore and primitive texts, preserving its considerable influence on the formation of the concept structure.

A negative assessment of *sickness* corresponds to associations with black and grey colors. Black forms associations to death and mourning, loss and deprivation, sorrow and grief. This color is connected with the powers of darkness. It mainly characterizes negative properties of things, phenomena or personal qualities (gloomy, sad, morose, joyless, ominous, cunning, devilish, outlaw, illegal, etc.) [11, p. 84–96]. Concepts of grey also imply negative connotations [11, p. 97–103], including the description of weather as dull, hazy, nasty and also appearance or mood characteristics, associated with despondency, boredom, age and illness.

On the contrary, *health* is considered to be a blessing or demonstration of good fortune [6, p. 66–74]. A positive assessment of *health* corresponds to associations with white, which is a positive marker of inner human characteristics: kindness, honesty, sincerity, nobility and others [11, p. 71–83]. White represents symbols of life, light, peace, spirituality and purity [4, p. 120–121; 15, p. 136–137].

A symbolic connection of white to purity and order is emphasised in the works of Bachelor [23] and Baudrillard [3]. Everything considered to be an extension of the human body – bathroom, kitchen, linen and underwear – is painted in a «surgically-virgin» white color. This color dominates the «organic» sphere with its «imperative of cleanness and primary bodily concerns». Other colors are gradually penetrating this area, but face strong psychological resistance [3, p. 38].

On the whole, the coincidence of the results of our analysis of associations with hue and achromatic shades with those of previous studies, testifies to a high degree of validity of the findings obtained during the experiment. Furthermore, we have revealed new, previously undescribed, factors that are important for understanding the concepts, relating to the distribution of associations within groups of shades.

Associations with groups of shades. The experiment enabled the visual characteristics of color terms to be specified. It showed that the perceptive images of both concepts are sensitive not only to hue, but also to the quantitative differences within the same hue, including its relative brightness (lightness) and saturation (brilliancy). This feature is most obviously presented in the semantics of yellow and green which, according to recent findings, possess notional duality and polysemy.

Referents analysis of green and its connotations, presented by Okhritskaya [11, p. 132–142] shows a connection with both concepts in the Russian linguoculture. On the one side, through associations with the freshness of something young and juicy, it relates to various figurative meanings connected to youth, adolescence, strength and health (in olden times in Russia herbs possessing medicinal properties were called «zelie» (from Russian «zeleniy», comp. «green») [9, p. 41]. On the other side, through a connection with something immature and raw there appear associations with sickness. Some shades of green associated with moor and peat also belong to the group of colors with «sickness» connotation [15, p. 191]. Based on the examination of lexical polysemy, Okhritskaya provides a verbal division of green shades into two parts: emerald, bright green and apple shades are associated with objects and phenomena from the plant kingdom that are symbolically connected to growth and health; whereas pale, faint, acid–green and blue-green shades relate to death, corruption, psychological discordance and sickness [11, p. 132–142]. The chromatic structures of both concepts obtained during our experiment allowed us to visualize and specify the verbal division. It is clearly seen on the schemes (*Figures 3, 7*) that brilliant green (S 1565-G) and light blue-green (S 0520-B50G) shades are associated with *health*, whereas dark shades of the whole green region of the spectrum (S 6020-B50G, S 6020-GY, S 6020-G50) together with brilliant yellow-green (S 6020-G50Y) are connected to *sickness*.

The experiment also identified the division in the group of yellow shades. According to Yalalova [22, p. 46], obtained from analysis of phraseological units denoting *sickness* in Russian (267 FE), yellow is actively used in the color range characterizing *sickness* (*yellow as a lemon*, *yellow as a bitter orange*). Braem [4, p. 67] also points at associations between lemon yellow and acid, poison, artificial, dangerous, sickly. In Russian culture yellow is the color of lies, deception and insanity [16, p. 39]. This color was considered dangerous and undesirable in many rites (e.g., in a bridal chapel) and contrasted to red reflecting the contradiction between *health* and *sickness* [9, p. 22]. Some shades of yellow obviously relate to a diseased condition – purulence, urine, faeces, and also with the colors of stinging wasps and desert sands not subject to human control [15, p. 211–212]. According to the data obtained during our experiment, *sickness* implies a light shade of yellow-green (S 0520-G50Y) and dark yellow (S 6020-Y). On the contrary, warm and brilliant shades of yellow (S 0580-Y, S 0585-Y50R, S 0520-Y, S 0520-Y50R) correlate with *health*.

The principle of pairs combined by the participants confirmed the opposition of properties that form concepts of *health* and *sickness*. A linguistic analysis of concepts conducted by Tuleninova revealed such characteristics as «integrity – violation of integrity», «stability – instability of functioning of human body», «strength – weakness» [20]. As a rule, the participants of our experiment opposed the provided concepts in lightness by choosing more or less contrasting shades for each.

On the whole, the use of color samples as stimuli and directed selection of associations allowed us to conduct a quantitative analysis of the chromatic structure of the concepts *health* and *sickness*. We were able to specify hue, lightness and saturation of shades forming color associations and to visualize chromatic images related to these concepts in Russian culture. The experimental method, its procedure and approved principles of color association, could be applied for structuring the chromatic images of other anthropologically relevant concepts. The research possesses wide prospects for further development, based on the material of other cultures, together with a potential for considerable application. The obtained results could be valuable in compiling topical dictionaries and reference books, teaching activities, as well as contributing to a great spectrum of practical tasks in architecture, design and advertising communication.

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