# Colour Associations of the Russian People 

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## Colour in culture

Various cultures make their own associations with colour. Numerous studies have demonstrated cultural differences in colour meanings and associations (Gage, 1993, 1999; Serov, 2004; Hebestreit, 2007; Thurn, 2007; O'Connor, 2015).
However, prior research prevailingly focused on associations with basic colour concepts, and only few studies have assessed the meaning of individual colour shades. The aim of this research is to continue the study of the cultural specificity of colour associations and to investigate if there are distinctive patterns in how Russian people subconsciously respond to colour with different degree of lightness, saturation and hue.

Particular design feature of this study allow us:
to determine frequency of occurrence of associations to colour stimuli; to estimate the number of associated terms;
to measure intensity of associations;
to specify hue, lightness and saturation of shades forming colour associations; to visualize chromatic images related to the anthropologically relevant concepts in Russian culture.


## Matrix of responses

The collocation of 24 terms and 27 colour samples composes a 648-cell matrix. The 1680 responses of the participants, that we received during the experiment, were extremely unevenly distributed in this matrix. Nearly one third of all cells (202) score 0 . Another third (210) score 1 or 2 and considered to be isolated cases. To highlight essential patterns, only the 236 that score 3 or higher are analysed in detail.
The outcome for the Russian sample was compared to Swedish ( $\mathrm{N}=70$ ) and Nepalese ( $\mathrm{N}=77$ ) samples (Jung, 2016) (Fig. 3).

## Participants

70 participants ( 51 females and 19 males) with a mean age of 25 years (ranging from 16 to 60) without any known colour vision defects,
who were born and reside in Russia, completed the survey in Russian. The experiment was conducted with each participant individually.

## Procedure

Experiment participants were presented 12 pairs of opposites: warm-cold, sorrow-happiness, calm-upset, near-distant, young-old, feminine-masculine, fast-slow, strong-weak, falsetrue, cheap-expensive, friendly-dangerous, me-others (Fig. 1). The stimulus words were selected from previous research on colour associations (e.g.: Madden, Hewett, and Roth, 2000) The participants were asked to match each word with only one colour sample from a chart.


| Color samples of the experiment $\begin{gathered}\text { Table } 1\end{gathered}$ |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |  |
| A | So30-N | s os20-Y | sos20-V | S 0520 R | S0520-850 | S $0520 . \mathrm{B}$ | s 0520.8509 | S $052 . \mathrm{G}$ | s os20.G50r |  |  |
| B | 4000.N | s 0580-r | s 0855-550R | S 1080-18 | s 3055-F508 | S 2068 | S 2000-850 | S 1565-6 | s 1075.G50Y |  |  |
| c | soo-N | $s$ so20-r | s602-Y50R | S6020.R | s 6020-8508 | S6020.B | s6020.850 | S602-G | s6020-S50r |  |  |
| Colour stimuli <br> To collect the data, we have designed a colour chart with 27 selected shades specified in the Natural Color System (Fig. 2). The colour chart included three shades of every NCS elementary colour (Y, R, B, G) and every secondary colour (Y50R, R50B, B50G, G50Y). The first shade was the most saturated colour, the second one was a dark shade, and the third one was a light shade for each of those eight elementary and secondary colours. Additionally, we included black, grey and white into the chart (Tab. 1). <br> Colour stimuli were presented all at the same time against the neutral mid-grey background under standard daylight illumination. |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  | Figure 2. Colour chart of the experiment |  |

## Frequency of occurrence

## of associations to colour stimuli

Across 70 observers, each colour sample used in this study was chosen on average 2.59 times (SD $=3.61$ ). 10 of 27 shades were chosen by each and every participant at least once (Fig. 5). These shades scoring 70 or higher are (in order of frequency): red (B4), yellow (B2), grey (B1), black (C1), pink (A4), lightviolet (A5), white (A1), light-blue (A6), light-orange (A3), orange (B3). Achromatic (group 1) and saturated (group B) colours occurred most frequently.

## Number of associated terms

The number of associated terms varied with colour. White (A1), light-yellow (A2) and light-violet (A5) elicited the highest number of associated terms, while orange (B3) the lowest.
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The results showed unique colour associations among the Russians especially for the pairs feminine-masculine, young-old, and friendly-dangerous (Fig. 4).

## Intensity of associations

Colour associations had different intensities. The highest intensity of associations was revealed for pink (A4) with feminine (41\%), red (B4) with upset (36\%) and dangerous (34\%), orange (B3) and yellow (B2) with happiness ( 31 and $30 \%$ respectively).
The lowest intensity of associated notions ( $<10 \%$ ) had dark-red (C4), dark-violet (C5), saturated blue-green (B7), dark-blue-green (C7), saturated green (B8), and dark-green (C8). The words slow, false, me, and others did not have particular associated colours.

Validation of the experimental methodology
To validate the experimental methodology, we compared the core associations revealed in the present study to those obtained in previous studies (e.g.: Alymova, 2007; Ohrickaja, 2012),

## Conclusions

The purpose of the present study was to specify the colour associations of the Russian people and to ascertain their denotative consistency. As denotata, samples of the Natural Color System were used. The experiment provided the following findings.

We were able to specify hue, lightness and saturation of shades forming color associations and to visualize chromatic images related to the anthropologically relevant concepts in Russian culture. Colour shades carry various associations with varying intensities.
Colours are not related to one specific term or vice versa.
Colour associations differ in their denotative consistency according to the subjects' sex, age, occupation, and religion.
The research described here is foremost exploratory. The revealed meanings associated with specific colours provide a conceptual framework for further research. 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 findings are of interest for professionals and academics working in visual communications, media, trade and advertising. 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 and design.


