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## Colour Associations in Different Cultures

Ivar Jung<sup>a\*</sup>, Yulia A. Griber<sup>b</sup>, Jeannette Hanenburg<sup>c</sup>, Shabnam Arbab<sup>d</sup>, Kohji Yoshimura<sup>e</sup>,  
Begüm Ulusoy<sup>f</sup>, Ibrahim M. Elhady<sup>g</sup>, Stefan Johansson<sup>h</sup>, Essam E. Samir<sup>i</sup>

<sup>a</sup> Linnaeus University, Kalmar, Sweden

<sup>b</sup> Smolensk State University, Smolensk, Russia

<sup>c</sup> Colour Professionals, Burcht-Antwerpen, Belgium

<sup>d</sup> Norwegian University of Science and Technology, Trondheim, Norway

<sup>e</sup> Kansai Gaidai University, Hirakata, Japan

<sup>f</sup> University of Huddersfield, Huddersfield, United Kingdom

<sup>g</sup> Consultant, Madinah, Saudi Arabia

<sup>h</sup> Stejo Designbyrå, Ronneby, Sweden

<sup>i</sup> Architect, Kairo, Egypt

\* Corresponding author: [ivar.jung@lnu.se](mailto:ivar.jung@lnu.se)

### ABSTRACT

The aim of this study is to investigate if there are colours that are associated with certain words. The study was conducted in nine countries (Germany, Iran, Japan, Nepal, Russia, Saudi Arabia, Sweden, Turkey and Uganda) to see if there are cultural differences in the way people associate colours with the words. The subjects were asked to match each of the words with only one colour. They could choose colours from the chart consisting of 27 colour samples selected from the NCS Atlas. In total, the dataset included 18,072 responses from 753 participants. The collected data were analysed by hue, chromaticness and the degree of blackness and whiteness. The results show that the colour associations with the words vary to different extent between the different countries. That indicates that there are universal associations with colours for some of the words, as well as cultural differences.

**Keywords:** Colour associations, design, psychology, culture, architecture

### INTRODUCTION

Associations with colours have interested researchers, artists, designers and marketers for a long time. Various studies have focused on how emotions and concepts are

connected with colours and colour combinations in different cultures, and if there is a coherence between different groups of people (e.g. Da Pos and Green-Armytage 2007). The aim of this study is to carry out further analysis of colour associations and to investigate if there are cultural differences in the way people associate colours with the words.

## EXPERIMENTAL

The method used in this research was previously performed in 2015–2016 during a pilot study in Sweden and Nepal (Jung 2016). Interim findings revealed in different countries were reported in a series of scientific publications in 2017–2018 (see e.g.: Jung et al. 2017; Griber and Jung 2017; Griber, Jung and Weber 2018).

In this study, participants were given twelve pairs of words (*Warm–Cold*, *Sorrow–Happiness*, *Calm–Upset*, *Near–Distant*, *Young–Old*, *Feminine–Masculine*, *Fast–Slow*, *Strong–Weak*, *False–True*, *Cheap–Expensive*, *Friendly–Dangerous*, *Me–Others*), and asked to match each word with only one colour sample from a chart with 27 selected shades from the NCS Atlas.

The colours selected for the colour chart included three shades of every NCS primary colour (Y, R, B, G) and every secondary colour (Y50R, R50B, B50G, G50Y). The first shade (A) was a light shade of those eight primary and secondary colours. The second (B) was the most saturated colour, the third one (C) was a dark shade. Additionally, we included black, grey, and white into the colour chart of the experiment (Table 1).

	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

Table 1: The colours selected for the colour chart

The study was conducted in nine countries: Germany (N=90), Iran (N=60), Japan (N=140), Nepal (N=77), Russia (70), Saudi Arabia (N=66), Sweden (N=70), Turkey (N=114) and Uganda (N=66). The countries represented in this study had different climate conditions, specific cultures and various religious traditions. In total, the dataset included 18,072 responses from 753 participants. The subjects did not have any known colour vision defects, were born and reside in the same country.

## RESULTS AND DISCUSSION

For some words like *Cold* or *Feminine* the chosen colours are more or less the same in all countries and concentrated to only a few dominant colours (Figure 1). Other words like *Upset* have more variations between the countries. In Sweden almost 47 % associated *Upset* with chromatic red, in Russia – 35%, in Turkey – only 4%, and in Iran – 0%.

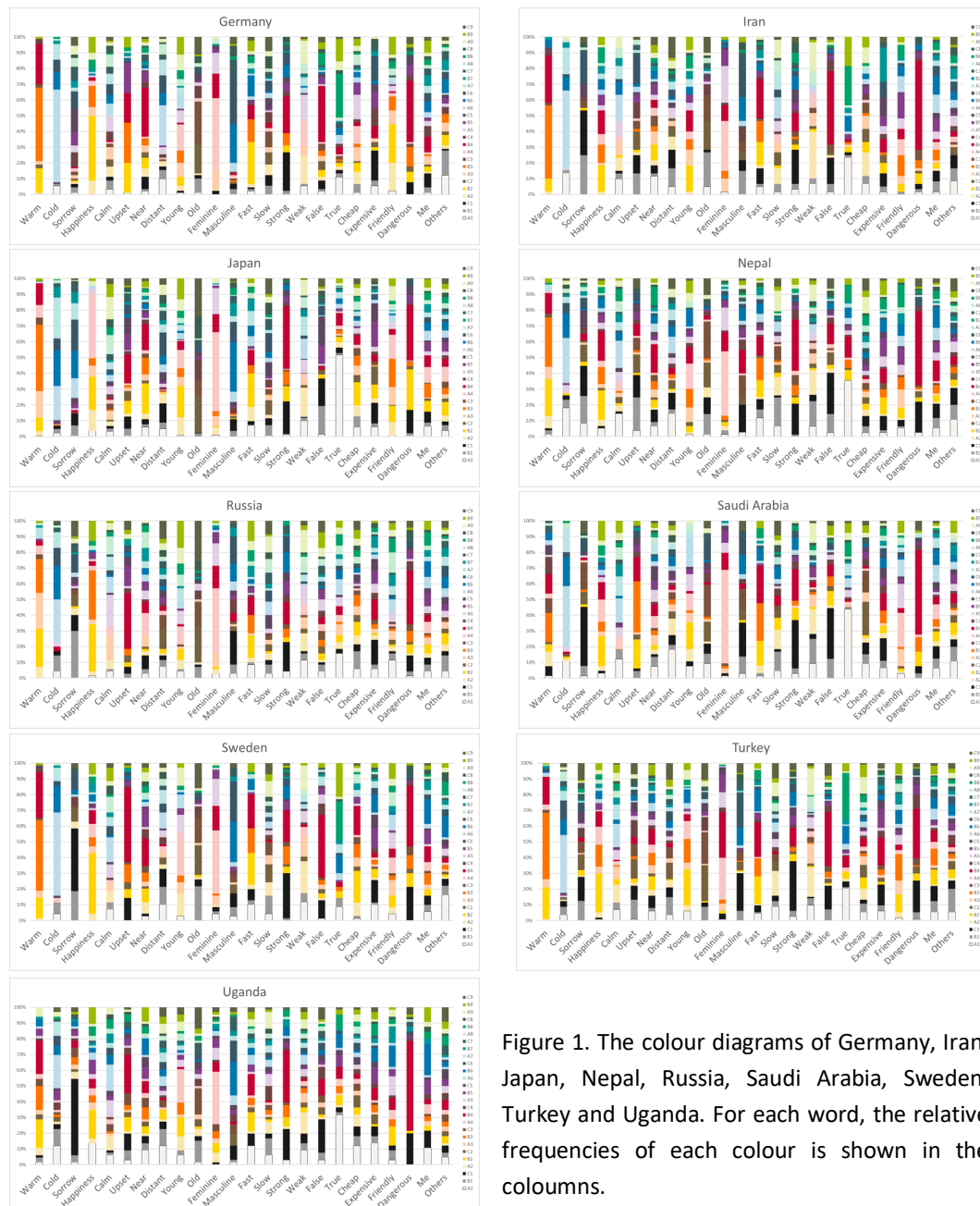


Figure 1. The colour diagrams of Germany, Iran, Japan, Nepal, Russia, Saudi Arabia, Sweden, Turkey and Uganda. For each word, the relative frequencies of each colour is shown in the columns.

Statistical analysis of the chosen colours reveals some general findings for the different words and we choose to present and discuss them word by word.



Figure 2: The two most chosen colours for the words *Warm*, *Cold*, *Sorrow*, *Happiness*, *Calm*, *Upset*, *Near*, *Distant*, *Young*, and *Old* in the different countries in our experiment. Higher bars mean a higher degree of coherence, whereas lower bars indicate a lesser degree (within a country).

**Warm.** Most countries have a dominance of orange, followed by red or yellow (Figure 2). In Russia dominant are yellow and pink.

**Cold.** Light blue is the most chosen colour in all countries. Germany, Iran and Sweden have the strongest connection between *Cold* and light blue.

**Sorrow.** Most countries have a dominance of black, grey, brown, and dark colours. Germany sticks out with only a few subjects choosing black and grey.

**Happiness.** Chromatic colours. Mostly yellow. Russia: also orange. Nepal: also red.

**Calm.** All countries: light and chromatic colours.

**Upset.** Russia, Sweden and Uganda: red, warm and chromatic colours. Iran, Nepal and Turkey: dark colours and grey. Germany and Saudi Arabia: orange and yellow.

**Near.** In Germany, Nepal and Sweden the most chosen colour is red. In Russia this word has strong associations with pink.

**Distant.** All countries: many different hues and shades. Germany: light colours, whereas dominant is light blue. Japan and Russia: dark colours.

**Young.** In general, this word is associated with light shades. Iran, Nepal and Turkey link it to more chromatic colours.

**Old.** All countries: dark and brown colours.

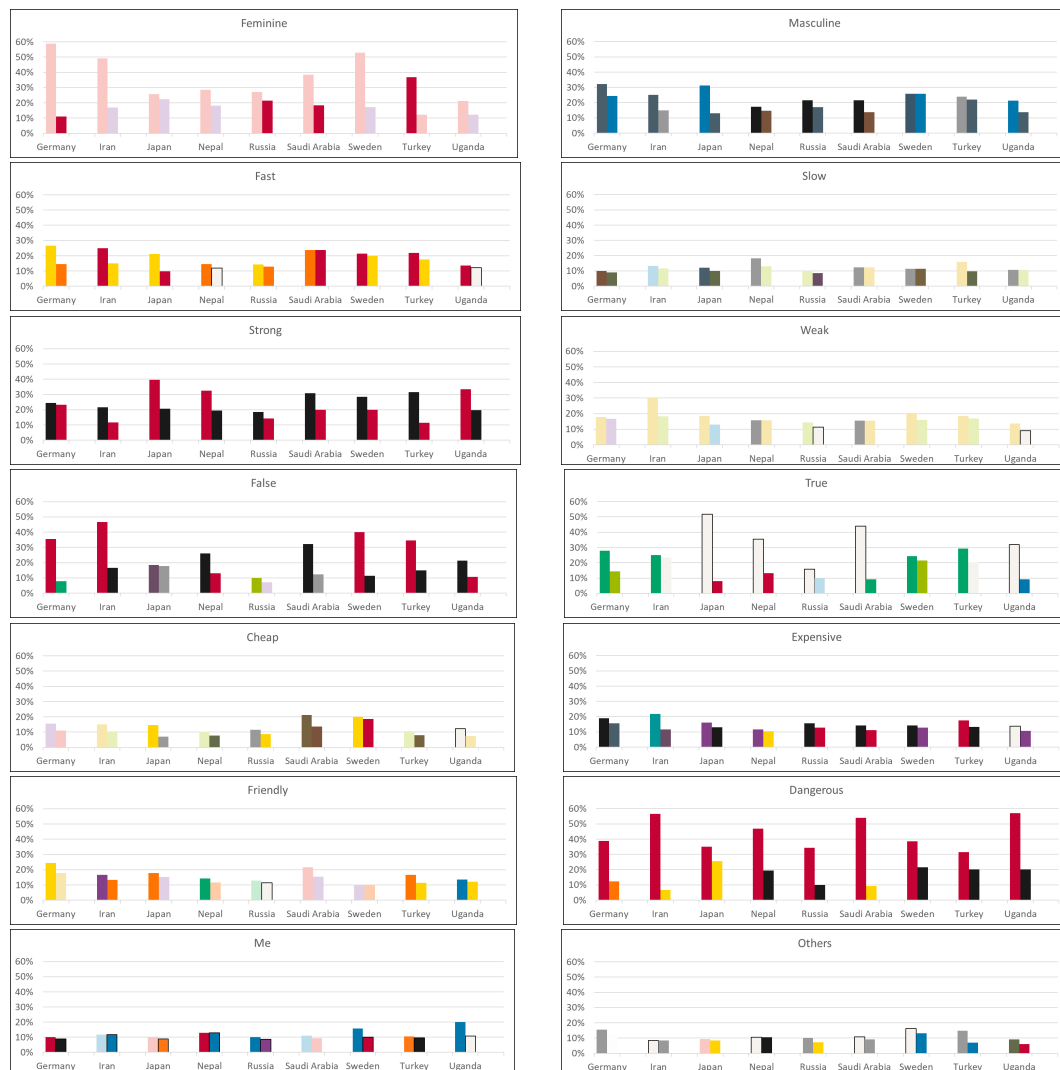


Figure 3: The two most chosen colours for the words *Feminine*, *Masculine*, *Fast*, *Slow*, *Strong*, *Weak*, *False*, *True*, *Cheap*, *Expensive*, *Friendly*, *Dangerous*, *Me* and *Others*.

**Feminine.** All countries: pink as the first choice, except Turkey, where this word is associated with red, see Figure 3.

**Masculine.** All countries: dark colours, mostly black and blue or black and brown.

**Fast.** All countries: chromatic colours, red, orange and yellow.

**Slow.** More spread out hues and more light nuances than *Fast*.

**Strong.** All countries: black, red and chromatic colours.

**Weak.** All countries: light and warm colours. Nepal and Saudi Arabia: also grey.

**False.** Germany, Iran, Sweden and Turkey: red as a dominant colour. Nepal, Saudi Arabia and Uganda: black.

**True.** Nepal, Russia, Saudi Arabia and Uganda: white. Germany, Iran, Sweden and Turkey: green.

**Cheap.** Spread out on many hues, lighter colours than in *Expensive*.

**Expensive.** Darker colours and more chromatic colours than in *Cheap* (Figure 3).

**Friendly.** Light and chromatic colours. Different hues.

**Dangerous.** All countries: red.

**Me.** Many different hues, many blue colours.

**Others.** Also spread out hues and nuances. More white and grey than in *Me*.

## CONCLUSION

Our experiment affirms that there are consistent patterns in color choices for words within different countries. The findings of this study demonstrate that the coherences between the countries are high for the words *Warm–Cold*, *Sorrow–Happiness*, *Calm*, *Distant*, *Young–Old*, *Feminine–Masculine*, *Fast*, *Strong–Weak*, *Expensive*, *Dangerous*. For some other words (*Upset*, *Near*, *Slow*, *False–True*, *Cheap*, *Friendly*, *Me–Others*) there are different colour associations in different countries. It would be possible, with extended studies and digital tools, to make a “colour association translator”, where one can see, how certain words are associated with colour in a specific country, and this is something we plan to examine in the future. This tool could be valuable for architects, designers and marketers, who are working worldwide with colour and communication in different cultures.

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## CONTACT

Senior lecturer, Ivar Jung, Department of Design  
Linnaeus University, S-391 82 Kalmar, SWEDEN  
E-mail: [ivar.jung@lnu.se](mailto:ivar.jung@lnu.se)  
0046705522638