

Turkish Colour Naming on the Net

Ulusoy, B.^a, Griffin, L.D.^b, Mylonas, D.^{b*}

^aDepartment of Interior Architecture and Environmental Design, Atılım University, Ankara, TURKEY

^bDepartment of Computer Science, University College London, UNITED KINGDOM

*d.mylonas@ucl.ac.uk

ABSTRACT

We explored Turkish colour naming using an Internet-based colour naming experiment to: a) collect colour names in wide cultural use with their corresponding colour ranges and response times, b) to estimate colour coordinates of centroids of 11 Turkish basic colour terms (BCTs) and to compare them to the 11 English BCTs estimated using the same web-experiment, and c) to establish the English equivalents of the most common Turkish colour names (n>11) based on the distribution of their colour coordinates. Turkish colour names were mostly monolexemic (61%) and 39% of responses were BCTs. The most frequent responses were the BCTs *mor* (eq. purple), *pembe* (eq. pink), *mavi* (eq. blue), *yeşil* (eq. green) and *sarı* (eq. yellow) followed by the non-basic *turkuaz* (eq. turquoise) and *lila* (eq. lilac). Response time analysis showed that participants responded quicker to *sarı*, *mor*, *beyaz* (eq. white) and *siyah* (eq. black) than to other terms. Turkish speakers reached consensus (dominance > 50%) for 25 colour names; *sarı* had the most samples named with consensus followed by *mor*, *bordo* (eq. burgundy) and *lacivet* (eq. navy blue). The comparison between centroids of Turkish and English eleven BCTs showed a very good agreement (CIEDE2000 distances: mean separation=2.5, standard deviation=1.5).

KEYWORDS: colour, names, Turkish

INTRODUCTION

Colour is used in visual communication in many different disciplines.^[1] How it is labelled and named in different languages is important if this usage is to be unambiguous. Recent studies have demonstrated the advantages of using the internet to conduct colour naming experiments,^[2,3] The aim of the current study is to investigate usage of Turkish colour terms with web based experiments for the first time.

Colour naming experiments in Turkish have been conducted by different researchers.^[4,5,6] Previous studies^[4,5] proved that BCTs in Turkish are consistent with B&K's^[7] 11 BCTs. A previous study investigated Turkish colour naming by list task frequency which revealed frequency (out of 60): 58 for green, 56 for yellow and black, etc.^[5] According to these studies,^[4,5,6] *lacivert* (eq. navy blue) has a controversial BCT candidate status as a colour term. Previous studies in Turkish colour naming have used a small number of observers and have been mostly focused on the BCTs. In the current study, hundreds of observers participated in an online, unconstrained colour naming experiment to explore basic and non-basic Turkish colour terms in wide cultural use allowing us to bridge the gap between the Turkish and English colour languages.^[3,8]

METHODS

An online colour naming experiment^[3] (available at: colournaming.com) was designed to collect multilingual colour names with their associated colour coordinates from a large number of observers. In this study, over three-hundred volunteers (n=310) named freely in Turkish a sequence of 20 randomly selected colour chips from 600 colour samples in total to produce 6200 raw responses. Participants were tested for possible colour vision deficiencies and the responses of those failing were excluded from further analysis (7%). The final Turkish

dataset consisted of 289 participants with normal colour vision. Their mean age was 27.7 years (SD = 7.9). Females provided 68.3% of the responses and males 31.7%. Raw responses were checked for spelling mistakes.

RESULTS

In this section, we present data on a) the number of words in different colour names, b) frequency of occurrence, c) response latency, d) consensus between observers and e) agreement of centroids of Turkish and English BCTs.

Single words were involved in 61% of colour names, two-word responses in 36% and three or more words in 3% (see Figure 1). Monolexemic BCTs consisted 39% of the responses.

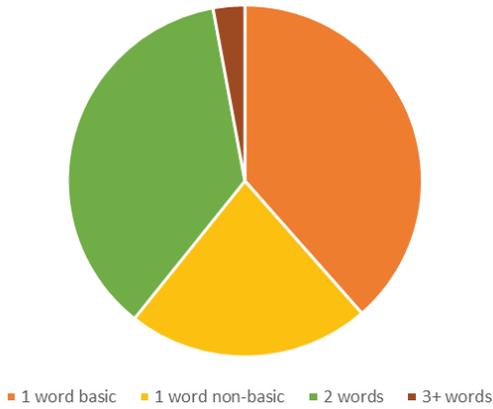


Figure 1. Number of words in responses of online colour name experiment.

Within the 30 most frequent colour names, 20 were monolexemic and ten compounds (Figure 2). Of the ten compounds, except *su yeşili* (eq. eau de Nil) and *toz pembe* (eq. pale pink), the others were light and dark shades of blue, green, pink and purple. *Mor* (eq. purple) was the most frequent name followed by *pembe* (eq. pink), *mavi* (eq. blue), *yeşil* (eq. green) and *sarı* (eq. yellow). Non-BCTs occurring in the 10 most frequent colour names were: *turkuaz* (eq. turquoise) (6th), *lila* (eq. lilac) (7th) and *açık mavi* (eq. light blue) (9th) whereas the equivalent BCTs for red (*kırmızı*) and white (*beyaz*) were found in the 15th and 20th positions respectively.

The median response time for each of the 30 fastest Turkish colour names are presented in Figure 3. *Sarı* (yellow) was the fastest responded colour name followed by *mor* (eq. purple), *beyaz* (eq. white), *siyah* (eq. black), and *gri* (eq. grey).

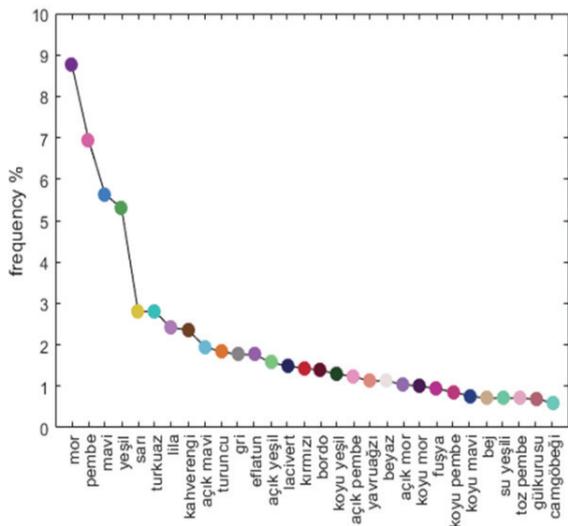


Figure 2. Most frequent Turkish colour names (n=30)

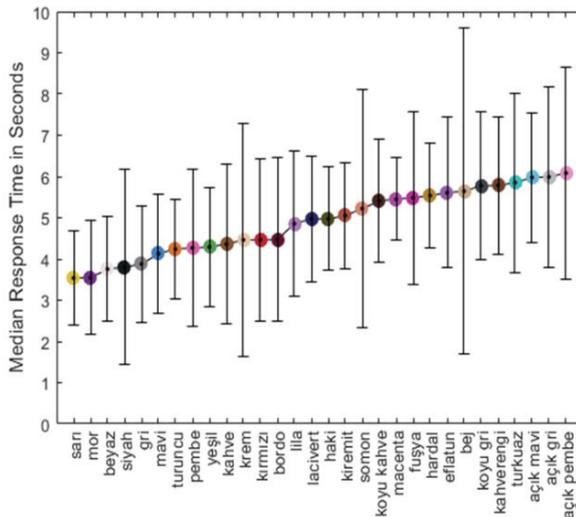


Figure 3. Median response times in seconds. Error bars denote semi-interquartile range

Consensus describes the agreement across participants in naming colour samples. Here, a colour sample was named with consensus if it was named consistently by more than 50% of responses ^[9] (see Figure 4). *Sarı* (eq. yellow) was the colour names with the largest number of samples named with consensus followed by *mor* (eq. purple), *bordo* (eq. claret red) and *lacivert* (eq. navy blue).

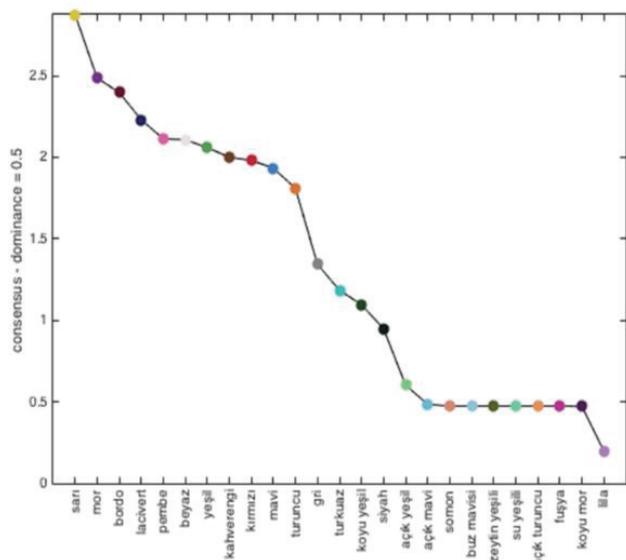


Figure 4. Percentage of colour samples named with consensus for the 25 colour names. For all other colour names, no sample achieved consensus.

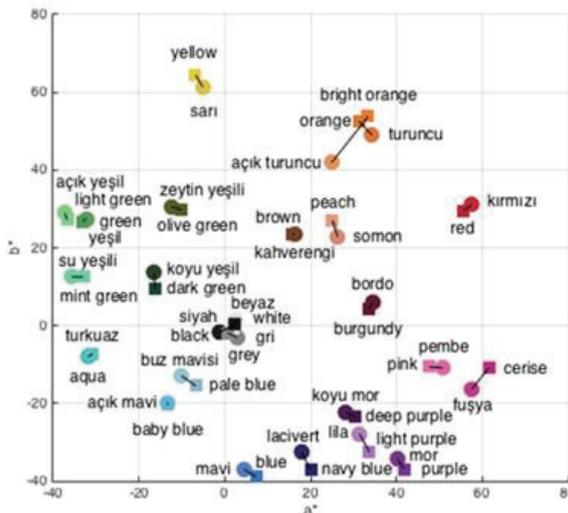


Figure 5. Consensual Turkish (circles) colour names (n=25) and their nearest English (squares) colour names in CIELAB based on CIEDE2000. Black lines connect the nearest neighbours.

We compared the centroids of Turkish BCTs with the equivalent centroids of BCTs in English.^[10] Centroids were calculated using a simple arithmetic mean of all samples assigned the same name in CIELAB and their mean colour difference was CIEDE2000 = 2.5 (SD = 1.5). The larger colour difference was found for the grey names (CIEDE2000 = 3.4) and the smaller for the green names (CIEDE2000 = 0.8).

The centroids of 25 colour names named with consensus in Turkish were compared against centroids of 126 English colour names given more than 10 times to identify their nearest neighbours based on CIEDE 2000 colour differences (Figure 5). The mean colour difference for all 25 pairs was similar to the agreement between the eleven BCTs, CIEDE = 2.64, SD = 1.57.

DISCUSSION AND CONCLUSION

This study aimed to facilitate colour communication between Turkish and English speakers on the Internet. We presented the 30 most frequent colour names, the 30 colour names with the fastest response time and the 25 colour names for which Turkish participant reached consensus. The comparison of the estimated centroids between Turkish and English BCTs^[3] resulted in a satisfactory agreement.

Similar to the previous study,^[5] Turkish speakers showed a high frequency of monolexemic colour names (61%) out of which 39% were BCTs. Previous research ^[5] reported that green was ranked first in the frequency analysis, however, in the current study purple was ranked as the first. The high frequency for purple can be explained from our sampling of the Munsell system.^[3] The non-basic names, turquoise (6th), lilac (7th) and light blue (9th) occurred more frequent than the BCTs red (15th), white (20th) and black. Frequency of occurrence in colour naming experiments is closely related to the size of the corresponding categories in colour space and these basic terms appear to occupy relative small regions in colour space. A recent study reported high cognitive

salience for turquoise and lilac in English and have been proposed as additional BCTs.^[10] The results demonstrate that Turkish speakers have a high degree of consensus on yellow, purple, claret red and navy blue; however, there is a large step after 11th colour name (orange). The study reveals 25 consensus dominant colour names in Turkish language with 11 BCTs and 14 non-basic colour names. The findings revealed that yellow is the fastest responded and the highest consensus colour term among Turkish participants which could be probed more in future studies. Comparison of Turkish and English data on the same web-based experiment provides English equivalents of most common Turkish colour names and a comparison between centroids of Turkish and English BCTs produced a very good agreement (CIEDE2000 distances: mean separation=2.5, standard deviation=1.5).

The findings of this study provide an insight into Turkish colour language; however, further investigation is needed to improve our understanding of Turkish colour terms, probe basic and non-basic colour terms in Turkish, improve colour communication between Turkish and the other colour languages of the world.

ACKNOWLEDGEMENTS

Dimitris Mylonas was supported by the University College London (UCL) Computer Science—Engineering and Physical Sciences Research Council (EPSRC) Doctoral Training Grant: EP/M506448/1 - 1573073.

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