

A Cross-cultural study of emotional Responses on Colours

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Abstract

This article investigates human's emotional responses on colours in Eastern Arabian Gulf culture based on a questionnaire. Totally 10 colour options were evaluated (i.e. violet, orange, green, red, blue, yellow, black, gray, white and no color) by 80 subjects based on 12 basic descriptive variables including clean, fresh, liked, new, heavy, hard, warm, modern, active, tense, relaxing, concentration. White colour was associated with emotion: clean, new, relaxing and concentration. Yellow is associated with freshness; however, red is the most liked color. Black was linked with heavy, hard and tense emotions. Tense mood is associated with red. Insignificant differences between colours with regard to warm mood were found. The link between colour preferences found for two topics living room and clothing and emotions elicited were discussed.

Keywords: colour, preference, emotion, mood, marketing, personality, design.

1. Introduction

Colour plays an important role in our life. For art and design products, designers consider careful use of colour in order to form product identity and differentiate brands. Moreover, sensible use of colour could influence consumer mood and feeling positively or negatively which subsequently affects consumers' attitude including purchase decision and preference. Therefore, understanding the psychological impacts of colours including associated emotions evoked by them is vital to enhance marketing design products (Singh, 2006). Some research studies have focused on the evaluation of emotional response of color, also named colour emotion or color-emotion associations. This is in order to establish links between colours and emotions. Consumers formulate associations including colour emotion association which could be powerful predictors of their behaviour. Marketers can whether clarify their own color strategies employing existing associations or develop new color associations for products that they can control (Priluck Grossman & Wisenblit, 1999).

Elliot and Maier in 2007 illustrated how color can act as a subtle environmental cue that has important influences on behaviour. It was suggested that red impairs performance on achievement tasks, because red is associated with the danger of failure in achievement contexts and evokes avoidance motivation (Elliot & Maier, 2007).

Researchers associated happiness with yellow, orange, and blue, on the other hand sadness was associated with red, black and brown colours. The color red has been associated with excitement, orange has been perceived as distressing and upsetting, purple as dignified and stately, yellow as cheerful, and blue has been associated with comfort and security. Blue was chosen for packaging design of laundry detergent because it signified cleanliness, while yellow was not perceived as clean and red was believed to actually damage clothing (Cimbalo, Beck & Sendziak, 1978).

Kaya and Epps revealed that the principle hues (i.e., red, yellow, green, blue, purple) comprised the highest number of positive emotional responses, followed by the intermediate hues (i.e., yellow-red, green-yellow, blue-green, purple-blue, and red-purple) and the achromatic colours (white, gray, and black). The color green evoked mainly positive emotions such as relaxation and comfort because it reminded most of the respondents of nature. The color green-yellow had the lowest number of positive responses because it was associated with vomit and elicited the feelings of sickness and disgust. For the achromatic colours, white attained a large number of positive responses, followed by the colours black and gray (Naz & Epps, 2004).

In a study carried out by Cimbalo *et al.* using college students, black and brown were found to be sad and yellow was happy. Yellow, orange, green, and blue were designated as happy colours by the children, and red, brown, and black were sad (Cimbalo *et al.*, 1978). Ainsworth *et al.* showed no significant differences between three hues red (warm), blue-green (cool) and white (neutral) used for office work environment on subjects mood including work performance, anxiety, depression, and arousal for 1 hour (Ainsworth, Simpson, & Cassell, 1993). Wilson in 1966 supported the hypothesis that red is a more "arousing" colour than green (Wilson, 1966). Park and Guerin showed empirically that meaning and preference for interior colour palettes do vary by culture in four different cultures investigated namely American, English, Korean, and Japanese (Park & Guerin, 2002). Kwallek *et al.* studied the effect of nine monochromatic office interior colours on workers clerical tasks performance and mood. Subjects made more proofreading errors in the white office than in blue and red. Depression, confusion and anger were caused by low saturated colours (white, grey, and beige) for females and high saturated colours (green, blue, purple, red, yellow and orange) for males. Colour preferences were lighter values may be in some sense more distracting than darker values. They suggested that colour preference concerning their interior environment may not always have positive relationship to individual's performance in the workplace (N Kwallek, Lewis, Lin-Hsiao, & Woodson, 1996).

Human response to colour and its dependency on culture is a controversial issue (Aslam, 2006; Jacobs, Keown, Worthley, & Ghymn, 1991). Some researchers believe it is universal and others

consider it as culturally dependant since they are constructed in the context of multiple social and cultural influences. Prado-león *et al.* compared colour associations in the Mexican university population with other cultures. They supported that not all colour associations are universal, since they are constructed in the context of multiple social and cultural influences (Lilia Roselia Prado-LeÓN, Rosalío Avila-Chaurand, & Rosales-Cinco, 2006). In 2006, Aslam argued that a cross-cultural perspective of colour research and application is essential for developing global marketing strategies (Aslam, 2006).

Cross-cultural studies have been carried out investigating differences across cultures in colour preferences and meaning (emotions association). Researchers suggested that designers should consider differences between cultures in which they market their products and take the advantage of these differences. This is accredited for colour as a psychological marketing tool (Singh, 2006). The color red was associated with love for people of China, Korea, Japan and the USA, but the Chinese also associated red with being good tasting. Some of the most important differences noted were which colours indicated expensive or inexpensive products. Whereas in China and Japan, the colour gray was associated with the word inexpensive, the opposite was true among US consumers. In Asian countries, the color purple was associated with expensive, but not in the USA (Jacobs *et al.*, 1991).

Some research studies were concerned with the relationship between perceptive aspects of colours (e.g. hue, lightness or value, and chroma or saturation) and colour emotions. It was found that hue is the dominant factor on color emotions. In 2006, Gao and Xin developed a color emotion map in CIELCH color space employing cluster analysis. The relationship between color emotion indexes and color perception attributes, i.e., hue, lightness, and chroma, were studied and the results indicated that the activity index was dependent on chroma, the potency index was dependent on lightness, and the definition index was dependent on both chroma and lightness (Gao & Xin, 2006). Gelineau (1981) showed that items of low saturation filled of obvious emotional stimulus characteristics which opposing his presumption (Gelineau, 1981).

In an investigation of children's emotional associations with colours, Boyatzis and Varghese (1994) found that bright colours (e.g., pink, blue, red) are associated with positive emotions (e.g., happy, strong) and dark colours (e.g., brown, black, gray) with negative emotions (e.g., sad, angry) (Boyatzis & Varghese, 1994). Hemphill (1996) analyzed color-emotion associations of undergraduate students and his results agreed with findings obtained by Boyatzis and Varghese (Boyatzis & Varghese, 1994).

Moreover, some colours maybe associated with several different emotions and some emotions are associated with more than one colour (Saito, 1996). As an example red has both positive and negative impressions such as active, strong, passionate, warm, but on the other hand aggressive, bloody, raging and intense. Green elicit the feelings of quietness, naturalness and on the other hand tiredness and guilt cited in (Naz & Epps, 2004; Saito, 1996). Schaie 1961 assessed the strength of association between colours and mood-tones. Some colours were found to be associated with several mood-tones and some mood-tones are associated with more than one colour (Schaie, 1961).

Carr Paynein 1958 ran two experiments with college students (men) evaluating the effect of color on the apparent weight of objects. Six chromatic colours differing in hue, brightness, and saturation were used. Different coloured objects of the same size differed in apparent weight which was affected by physical brightness and independent of colour (Payne, 1958).

The relationship between color and emotion is closely tied to color preferences. Terwogt and Hoeksma in 1995 established preferences for colours and emotions within three age groups (7-year-old children, 11-year-old children, and adults). Color and emotion preferences were found changing with age. They suggested that emotion-color combinations are meaningfully related to emotion preferences and color preferences; and at all ages, colours and emotions are consistently related to each other (Terwogt & Hoeksma, 1995). In particular, color preferences are associated with whether a color elicits positive or negative feelings. However, Saito (1996) found that the color black elicited

both negative and positive responses among Japanese subjects, and that black was often a preferred color among young people (Saito, 1996).

Certain colours are also preferred in certain cultures. The notion that color preferences are formulated through associations is a potentially important finding for marketing practitioners interested in determining colours for products. Rather than examining general color preferences among consumers, it may be preferable to learn consumers' color associations as a basis for understanding the emotional aspects of color. Marketers can also use the theory of associations to create meanings for particular colours or to develop a brand image around a color. It is important to understand that consumers have different color preferences for different product categories. Research studies suggest that preferences for colours in particular contexts may be culturally determined based on associations people of the same culture learn (Priluck Grossman & Wisenblit, 1999).

Colours can also be described in temperature terms, such as "warm" or "cool". The cool colours (e.g., blue, green, purple) are generally considered to be restful and quiet, while the warm colours (e.g., red, yellow, orange) are seen as active and stimulating (Naz & Epps, 2004). Furthermore, people exposed to red and yellow colours reported higher levels of anxiety than did people exposed to cool blue and green colours (Nancy Kwallek, Lewis, & Robbins, 1988). However, in other studies, no relationships have been found between the individuals' mood states and colours (Ainsworth et al., 1993; N Kwallek et al., 1996).

The literature review showed that most research studies has been conducted in Western or some Asian countries, with little research into colour associations in Southeast Asian, Indian, Near Eastern, Middle Eastern, Hispanic American or African states (Aslam, 2006). It is evident that there is a significant role of colour associations in design and some research studies showed that it colour emotion association is culturally dependent. Moreover, there is limited research found in this field relating to Eastern Arabian Gulf cultural context. The aim of this present study was to identify colour-emotions associations among undergraduate students in Sultanate of Oman. The authors carried out a study investigating colour preferences of undergraduate students in Oman for two different topics. It was found interesting to link their colour preferences for each topic to elicited emotions.

2. Method

2.1. Participants

The participants were 80 undergraduate students from Al-Zahra College for Women in Oman (their age ranging from 20 to 23 years old). They were studying in different programmes including Graphic Design and Information technology. Participants were from different levels of study.

2.2. Materials and procedure

Colours used consisted of 3 primary colours (red, blue, yellow), 3 secondary colours (violet, orange, green), supplemented with black, gray and white. There was a choice of (no colour). The emotions involved were the emotions frequently employed in previous research studies. The emotion and its opposite were both used in order to clarify the questions with regard to the associated emotion. These were all translated into Arabic as it is the mother tongue of culture investigated. These were warm (not cool), heavy (not light), modern (not classical), clean (not dirty), active (not passive), hard (not soft), tense (not relaxed), concentrate (not disturbed) and fresh (not stale).

The study consisted of two parts. First, the participants were asked to link colours to emotions by selecting an appropriate emotion for each colour. For each emotion, participants were asked to choose the color that they felt fitted best the feeling given. Participants were asked to fill a questionnaire lists ten choices and were allowed to choose one color for each emotion. In the second

part of the study, emotions associated to preferred colours for two topics clothing and living room were established (Hanafy & Sanad, 2015).

Participants were asked to respond to the following questions: “Which of these colours do you feel is the most relaxing one?” “Which of these colours do you feel is the most active one?” “Which of these colours makes you concentrate?” “Which colour does give you the feeling of cleanliness?” “Which colour do you feel as a new?” “Which of these colours do you like?” “Which of these colours do you feel it is heavy?” “Which of these colours do you feel it is hard?” “Which of these colours do you feel it is Warm?” “Which of these colours do you feel it is Modern?” “Which of these colours do you feel it is fresh?” “Which of these colours do you feel it is Tense?”.

3. Results and discussion

3.1. Analysis of colour-emotion association

In this study, 80 subjects were used to fill a questionnaire individually with respect to colour emotion association. Every subject had to choose a colour for each of 12 moods or emotions listed (i.e. emotions relaxation, active, concentration, clean, new, liked, heavy, hard, warm, modern, fresh, and tense). These choices induced a total of 960 colour choices. Frequencies of colour selection for the moods were collected from questionnaires filled by participants. These frequencies were presented in the form of participants percentages. Generally, from 960 colour choices, the white colour was the most selected colour with 17% of the total choices, followed by the yellow (12%), black (11%), blue and no (10% each), violet, red, green and orange (9% each), and gray the least selected colour (5%). This result agrees with Naz and Epps as white obtained the highest percentages of responses within range of colours tested (Naz & Epps, 2004).

Fig.1 shows the percentages of participants' selection of each colour for every mood or emotion. The 3 colour emotions would be categorized according to their literal meanings into the evaluative, potency and activity factors. From Figure 1, most of the participants chose white as the colour gives the feeling of cleanliness with 30%, followed by blue (20%) and green (18.8%). The rest of colours were insignificantly selected by the participants. These results conform partially with Cimbalo *et al.* as the colour blue were found associated to cleanliness (Cimbalo *et al.*, 1978). However in this study the white colour was found more associated with cleanliness than blue. Ouet *al.* compared British and Chinese cultures and found poor correlations between British and Chinese data in like– dislike: Chinese observers tended to prefer colours that were clean, fresh, or modern, whereas this tendency did not occur for British observers (Ou, Luo, Woodcock & Wright, 2004).

With respect to freshness, it is interesting to find 30% of the subjects responded to “yellow” as the most colour evoking the feeling of freshness, followed by green (15%), orange (13.75%) and blue (12.5%). The most “liked” colour was “red” with 22.5%, followed by blue 15%, black 11.3%, violet and yellow (8.75% for each one).

With regard to potency factors (i.e. Heavy-light and Hard-soft emotion scales), it is evident from Fig.1 that subjects selected “black” as the colour eliciting the feeling of heavy and hard emotions. With respect to, mood heavy, black was selected with 26.3% and followed by yellow (20%), orange (11.3%), and violet (10%). Participants significantly associated “black” with hardness, as 41.3% of the subjects selected “black” as the colour evoking the feeling of hardness. This is followed by the choice of “no colour” with 15% of the participants, red 12.5%, yellow 7.5%, orange 6.3%. However, Hemphill in 1996 associated grey with negative emotions more significantly than black.

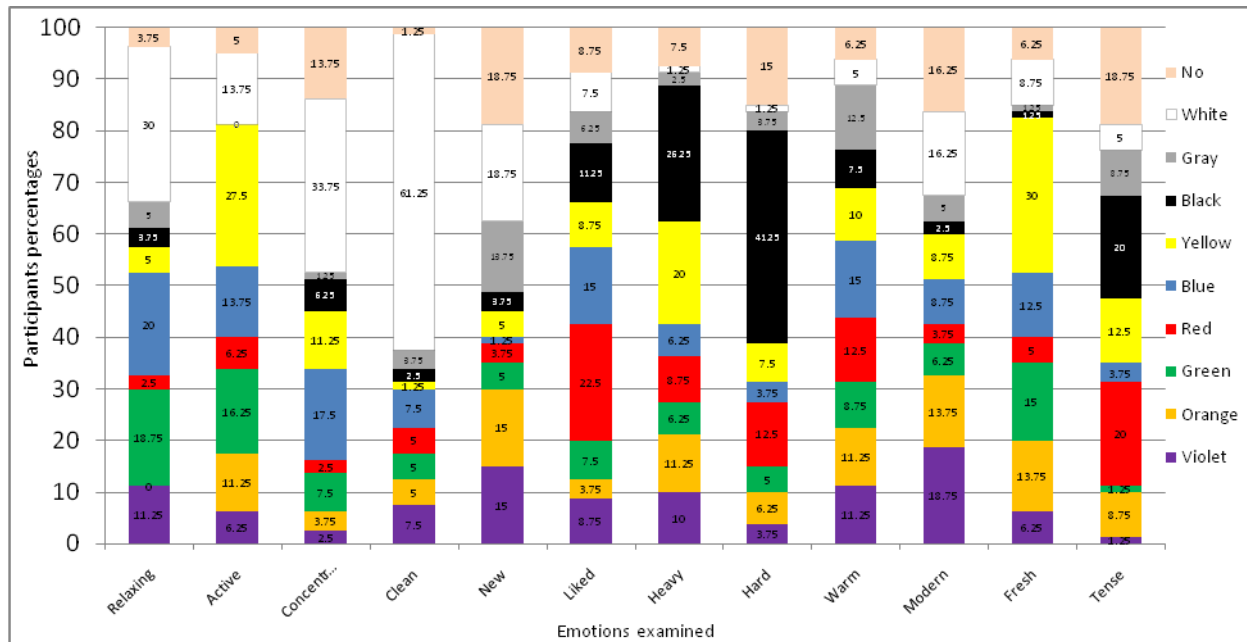


Fig.1 Percentages of participants picking each colour for each emotion examined

Activity factors including the following emotions (moods): warm, modern, active, tense, relaxing and concentrate were investigated. 15% of the participants selected the colour blue as the colour gives the feeling of warm, followed by red and gray with 12.5%, violet and orange (11.3%), yellow (10%), green (8.8%), black (7.5%), no (6.3), white (5%). These results contradict with previous research results found that red is the colour is most associated with emotion “warm”. The other interesting point is that there were insignificant differences between percentages of participants picking the warm colour. The colour violet is the most associated with violet with 18.75%, followed by white and no colour with (16.3% each), orange 13.8%, blue and yellow 8.8% each, green 6.25%, gray 5%, red 3.75%, 2.5% for black. From Fig.1, it is evident that yellow was selected as the most colour associated with the mood “active” with 27.5% of the participants, then green 16.3%, followed by blue and white in the third position with 13.8% each, orange 11.3%, violet and red 6.3%, no colour (5%). Previous research studies showed controversial moods associated with yellow (i.e. happiness, depression, confusion and anger) (Cimbalo et al., 1978). In this study, yellow is significantly associated with fresh and active emotions.

Colours most associated with both tense and relax moods are presented in Fig.1, black and red were almost associated with the mood tense with 20% each, followed by no colour 18.8%, yellow 12.5%, orange and gray 8.8%, white 5%, blue 3.8%, green and violet 1.3%. On the other hand, white was selected by subjects as the most relaxing colour with 30%, followed by green and blue with 20 and 18.8% respectively (see Fig.1), violet (11.3%). Students were asked to select the colour helps them concentrating. The white colour were almost the selected colour with 33.75%, blue 17.5%, no colour 13.8%, yellow 11.3%, green 7.5%, black 6.3%, orange 3.8%, violet 2.5%.

3.2. The relationship between colour preferences and colour emotion.

In a previous study carried out by the authors (Hanafy & Sanad, 2015), colour preferences for two topics namely clothing and living room. White was chosen by 30% as the most preferred colour for living room, however blue was chosen by 15% as the most favourite colour for clothing. It was found

important to analyse the emotions contribute to colour preference in these two topics. In other words, colours and emotions links can be explained on the basis of color preferences.

With respect to the colour white, 162 of the participants (17%) responded to white and associated it with different moods. In this part of the study we are investigating the reason for selecting white as the most favourite colour for living room in terms of emotions elicited by it. From Fig. 2, 30.3% associated white with “clean” mood 16.7% of them associated them with the mood “concentration”, 14.8% with relaxing mood, 9.3% with “new” mood, 8% with “modern” emotion, 6.8% active, fresh 4.3%, liked 3.7%, warm 2.5%, 0.6 for heavy and hard. It is evident that the most important emotion associated significantly with colour white is “clean” mood.

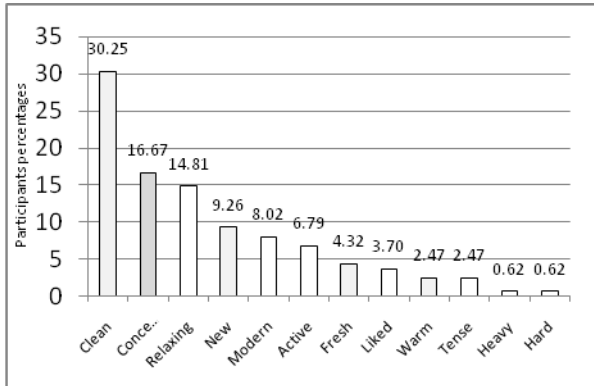


Fig. 2 Emotions contribute to the selection of the colour “white” in percentages

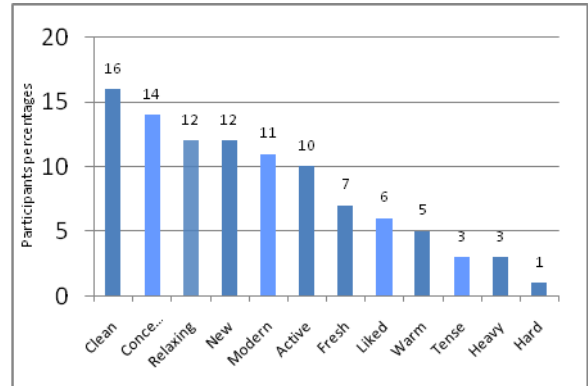


Fig. 3 Emotions contribute to the selection of the colour “Blue” in percentages

From Fig. 3, the colour “blue” was selected by 100 participants and associated with a variety of emotions. Emotions associated with blue were clean 16%, helps concentrating 14%, “relaxing” and “new”(12% each),modern (11%), active(10%), fresh (7%), liked (6%), warm(5%), tense and heavy(3%) each, hard (1%).

Further research studies are recommended investigating more negative emotions and wider range of emotions and colours. Relationship between colour preferences and emotions in a variety of topics related to art and design products would be interesting.

4. Conclusions

In this study, the color-emotion associations of undergraduate students from Eastern Arabian Gulf culture were analyzed. White was found significantly the colour associated with the positive emotions “clean”, “relax”, “concentrate”. Freshness and active emotions are associated with the colour yellow. The red is the most “liked” colour by the participants. In addition to white, blue and green colours were associated with relaxing mood. However, the colour black is linked to the emotions “heavy” and “hard”. The red and black colours were equally associated with the mood “tense”. This is followed by no colour for tense mood. Interesting finding in this study needs extended investigation is the association between blue and “warm” mood, as most research studies showed that blue is a colour for “cold” mood. Moreover, insignificant differences were found between all colours associated with warm mood. White colour was selected for living room as it gives the emotion of cleanliness. The most significant emotion elicited by blue (the most preferred colour for clothing) was cleanliness as well. Twelve moods tested were found effective in preferred colours for living room and clothing with similar order. Clean mood was the most important mood followed by concentrate, relaxed, new, modern, active, fresh, liked, warm, tense, heavy and hard.

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