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Colours of Emotion, Trust, and Exclusivity: A Cross-Cultural Study

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ABSTRACT

Colours influence the way people feel, think, and behave. The globalising (internet) economy induces traditions and beliefs to be transferred from one society to another. Nevertheless, although people may now act more globally, they also still act locally within their cultural groups. This points to the possibility of continuous change in universal and culturally specific colour associations. Therefore, this study aims to investigate variations in colour associations across cultures. To get a better grip on the global impact on the cultural dynamics, cultural groups are distinguished through self-identified membership, instead of through country and nationality demographics. Specifically, a comparison is made with the colours for trust, emotion, and exclusivity between 1,218 individuals from four cultural (ethnic) groups: Dutch; French; Greek; and Russian. Participating in an online survey, they indicated their associations for colour variations of blue, red, yellow, and black. The results confirm general, universal colour associations. Some distinctive independent cultural specifics through varying colour brightness may possibly render the association more or less strong for the colour–attitude relationships of red for emotion and blue for trust. Pure yellow was a noticeable colour associated with emotion by the Russian group.

KEYWORDS colour, culture, emotion, trust, exclusivity

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1. Introduction

Colours are everywhere and influence people's attitudes and behaviour. The ongoing process of a globalising (internet) economy causes traditions and beliefs to be transferred from one society to another. However, although people are now acting more globally, they also still act locally within their cultural groups. This points to the possibility of (continuous) change in universal and culturally specific colour associations. Several overview studies have noted that colour meanings, as well as individuals' preferences, are moderated by their cultural backgrounds (Lee and Lee, 2021; Yi and Shamey, 2015). Recently, Mohr *et al.* (2018) noted that prior colour studies have provided too heterogeneous findings that were dependent on the context (such as the appropriate colour for interior spaces, logos, websites, etc.). They emphasised that empirical evidence-based investigations are needed to unravel the universal and culturally specific association patterns. In a similar vein, Witzel (2019) highlighted misconceptions about colour categories that should be considered. Subsequently, colour-specific findings would advance, more generally, the exploration of the biological, ecological, and cultural influences of human functioning. Remarkably, cross-cultural studies on colour have mostly identified groups by nationality or country. These constructs have provided a rather imprecise identification; it has been increasingly found that comparing national cultures or countries does not reflect reality. A better way of categorising cultures is through (ethnic) self-identification. This information is more indicative of the cultural identity and considers the dynamics in societies (for further references, see Broeder, 2022). The present study addresses this gap in prior cross-cultural colour investigations. Members of cultures are identified through their ethnic self-identification. Hence, this study aims to unravel colour associations across cultures. New empirical data are presented for four cultural groups in Europe.

This paper is structured as follows. First, the core dimensions of colour are clarified. Additionally, colour variations are related to their impacts on people. Specifically, some recent findings are discussed regarding the attitudes and purchase intentions of consumers online. To this end, the findings are detailed regarding the colour association for emotion, trust, and exclusivity, differentiated by the Dutch, French, Greek, and Russian cultural groups.

1.1. Colour differentiations

Colours vary on multiple attributes. The basic dimensions are hue, lightness, and chroma (Elliot and

Maier, 2012; Fraser and Banks, 2004). Hue refers to the wavelength of a colour. Human eyes absorb light on different wavelengths, after which our brain converts it into the colours we see. Hues are the specific colour variations perceived by human beings (such as in a rainbow). The second colour dimension specified is lightness (or brightness). This is basically the white-to-black attribute of a colour, i.e., the presence of grey (tone), white (tint), or black (shade). Finally, the chroma attribute refers to colourfulness. This is basically the vividness of a colour.

Blue and red are the most investigated and compared colours, detailed overviews for which are provided by Labrecque *et al.* (2013), Labrecque (2020), and Roschk *et al.* (2017). Traditionally, and in general, some colours are perceived as more attractive than others. According to Kodžoman *et al.* (2022), blue is the most attractive colour, followed by red and green. The least preferred colour is yellow. Recently, cross-country investigations by Jonauskaitė *et al.* (2016) have supported that, in general, the most preferred hue is green-blue (cyan) and the least preferred hue is yellow.

Prior studies have discovered that colour variations have different physiological, attitudinal, and behavioural influences (Elliot and Maier, 2014). Physiologically, different colours have been investigated for their influence on heart rate, respiratory rate, blood pressure, and skin-conductance response. Saturated and bright colours evoke higher arousal; specifically, red elicits higher arousal than blue (Wilms and Oberfeld, 2018) and green (Kuzinas *et al.*, 2016).

Several extant studies have found attitudinal effects of interior surface colours, such as the wall colour of a classroom (Yildirim *et al.*, 2016), the (paper) background colour of a restaurant menu (Magnini and Kim 2016), or a luxury hotel room (Kim *et al.*, 2020). Generally, warm colours are more arousing, exciting, and distracting than cool colours. In particular, the warm colour red is linked to excitement, activity, strength, and stimulation. It stimulates human feelings and activates people (Al-Ayash *et al.*, 2016; Chou *et al.*, 2020; Gorn *et al.*, 2004). Cool colours are more satisfying than warm ones. These colours, especially the colour blue, are generally perceived as comfortable, relaxing, peaceful, and calming. Additionally, they have the potential to decrease anxiety levels (Clarke and Costall, 2008; Song *et al.*, 2020). Warm colours have a negative association in terms of evoking pleasure. Conversely, cool colours make one feel good, joyful, happy, or satisfied (Mazaheri *et al.*, 2011). Specifically, in a retail context, cool colours increase (online) shopping intentions (Roschk *et al.*, 2017; Seckler *et al.*, 2015).

In a general sense, high value colours produce greater feelings of relaxation and greater liking for the brand or product. Specifically, for pleasure, light shades of red are recommended (Gorn et al., 1997). Across 55 countries, Jonauskaite et al. (2019) explored the influence of the physical environment on colour associations. They found that people living further away from the equator, in less sunny and more rainy countries, were more likely to associate the colour yellow with the emotion of joy. For evoking trust, the most prominent colour is blue, especially compared to the distrust associated with red (Su et al., 2019). Darker shades, particularly black and purple, express exclusivity and sophistication (Labrecque and Milne, 2012).

For behavioural intentions in online shopping contexts, several studies have confirmed that colours contribute to the web store's 'motivational power' (arousal and emotion) and 'likeability' (pleasure) (Poels and De Witte, 2008). Colours have a specific impact on shopping behaviour, such as unplanned purchase, time spent on the web site, and overall satisfaction (Choi et al., 2020; Koo and Ju, 2010; Mummalaneni, 2005). Specifically, Lee and Lee (2006) found that a lighter red colour toned down the associations of aggression and active feelings, in comparison to a darker shade of red.

1.2. Cultural differentiations

Adams and Osgood (1973) provided a good example of a classic study on cultural colour differentiations. They investigated the affective meaning of eight distinct colour concepts (reported by male high school student groups from 20 countries representing 23 cultures). Through a semantic differential consisting of opposite adjective pairs, the culturally diverse group rated colours for the following factors: valuation (good/bad); potency (strong/weak); and activity (active/passive). This three-dimensional construct was stable across cultures. For the evaluation factor, the colour blue scored the highest (i.e., most cultures preferred this colour). The most potent colours were black and red; the most active colour was red; black was the most consistently agreed upon colour; and blue was ranked as the most familiar one. Follow-up cross-cultural studies on colour meanings have revealed that people of different cultures have a wide variety of types of meanings and attitudes. Empirical investigations support the existence of universal and culture-specific patterns for colour meanings. The overall favourite colours have been ordered as follows: blue; red or green; and then yellow (Aslam, 2006; Bakker et al., 2015; Cyr et al., 2010; Madden et al., 2000). Ou et al.'s (2018) quantitative modelling techniques based on empirical data from 12 regions worldwide presented consistent, culture-independent patterns for colour emotions

(regarding warm/cool, heavy/light, active/passive). Elaborating on this, Witzel et al. (2019) noted that the perception of purer (saturated) red, yellow, green, and blue colours exhibited more cross-cultural stability than other colours.

From an (online) marketing communication perspective, Broeder and Scherp (2017) initiated a series of cross-cultural investigations on the influence of colour on online purchasing intention in a mock-up web shop. Pure yellow was the most evocative colour where persuasion was concerned. In their study, the colour made Western consumers score higher on purchase intention than the pure colours red and blue. A similar, more or less evocative impact of a specific colour could not be found for Asian consumers. Some recent investigations, following on from Broeder and Scherp (2017), have indicated that colours contribute to the web store's motivational power and likeability, consequently enhancing the possibility that the intended behaviour (purchase, booking) is actually performed. In this regard, the colour variations compared in these follow-up studies are presented in Figure 1.

	Light values	Dark values
Blue trust		
Red emotion		

Figure 1. Colour variations compared for blue trust (Broeder and Snijder, 2019) and red emotion (Broeder and Wildeman, 2020).

Broeder and Snijder (2019) found that both Dutch and Chinese consumer groups preferred the use of very dark blue [HSL (208, 50, 20)] over very soft light blue [HSL (209, 50, 70)] in online shopping environments for creating trust. Similarly, in Broeder and Wildeman's (2020) study, red as the most emotion-inducing colour was investigated among Dutch and Vietnamese groups: very light red [HSL (0, 100, 75)] was found to be more evocative for purchase intention than dark red [HSL (0, 100, 24)].

2. Method

2.1. Objective

The present study specifically aims to examine: (1) the associations for emotion, trust, and exclusivity for six colours; and (2) the moderation of cultural background. New empirical insights are presented by differentiating

cultural groups through individual (ethnic) self-identification.

2.2. Participants

Between 2017 and 2019, an online questionnaire was completed by 1,218 participants from four different cultural groups [the Netherlands (*N* = 567), France (*N* = 158), Greece (*N* = 298), and Russia (*N* = 195)]. They were selected through non-probabilistic convenience sampling and their cultural background was ascertained through self-identification ('To what ethnic group do you belong?'). This did not necessarily match their birth-country or their country-of-living. There were 539 (44%) male and 679 (56%) female participants, and the mean age was 30 years (age range, 15–65 years). The education level was predominantly middle/higher education or university.

2.3. Questionnaire

The respondents filled in an online questionnaire through Qualtrics. The questions were asked in English, which was not the native language of the participants. Colour associations were assessed with three questions ('The colour I associate the most with trust/emotion/exclusivity is ...'). For each question, they had to select from six coloured squares: pure blue, dark blue, pure yellow, pure red, light red, and black. The RGB (red, green, blue) and HSL (hue, saturation, lightness) codes of the colours are detailed in Table 1; the name labels and codes are derived from www.colorhexa.com. Some of these colour variations have been investigated in earlier research by Broeder and Scherp (2017), Broeder and Snijder (2019), and Broeder and Wildeman (2020).







	RGB colour model	Hue	HSL colour model Saturation	Lightness	
Pure blue	#0000FF	240	100	50	
Dark blue	#1A3650	208	50	20	
Pure yellow	#FFFF00	60	100	50	
Pure red	#FF0000	0	100	50	
Light red	#FF7F7F	0	100	75	
Black	#000000	170	0	0	

Table 1. Characteristics of the colours used in this study.

3. Results

3.1. Colour and emotion

The colour–emotion profiles for the four groups are presented in Figure 2. Red, specifically pure red, was associated the most with emotion, whereas dark blue and black were associated with it the least.

The proportion of emotion association with pure red reported by the Dutch (62%) and Greek (57%) respondents was higher compared to that of the French

(46%) and Russian (39%) ones. Notably, yellow emerged as the second colour of emotion as reported by 33% of the Russian group (much higher than the other groups). Separate chi-square tests confirmed that there was a significant relationship between cultural groups and the emotion–colour profile: $\chi^2 (15) = 134,998, p < 0.001, phi = 0.192$. The colour associations for emotion were independent of gender: $\chi^2 (5) = 8,20; p = 0.145$.

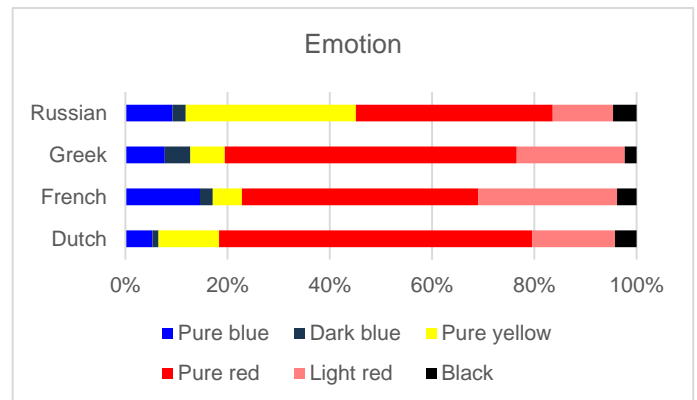


Figure 2. Colour associations for emotion.

3.2. Colour and trust

For all four groups, blue, specifically pure blue, was associated the most with trust. In comparison, pure red and pure yellow were associated with it the least. Figure 3 depicts the trust–colour profiles for the culturally different groups in the present study.

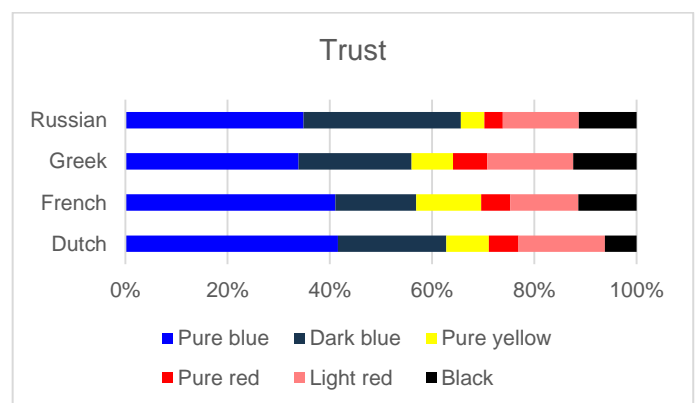


Figure 3. Colour associations for trust.

For trust, the proportion of associations with pure blue reported by the Dutch (42%) and French (41%) respondents was higher compared to the proportion of Russian (35%) and Greek (34%) ones. Dark blue emerged as the second colour for trust in all four groups.

There was a statistically significant relationship between cultural groups and the trust–colour profile: $\chi^2 (15) = 34,623$; $p = 0.003$; $\phi = 0.097$. A chi-square test for independence indicated a significant relationship between colour associations for trust and gender: $\chi^2 (5) = 21,645$; $p = 0.001$; $\phi = 0.133$. Notably, the proportion of female respondents who associated pure blue with trust (52%) was comparable to the proportion of male respondents (49%). However, a gender difference was evident for the light red associations. A higher proportion of female respondents (69%) associated trust with light red compared to the male respondents (31%).

3.3. Colour and exclusivity

Figure 4 displays the colour–exclusivity profiles per group. Black and dark blue were associated more with exclusivity, while pure blue and light red had the opposite association.

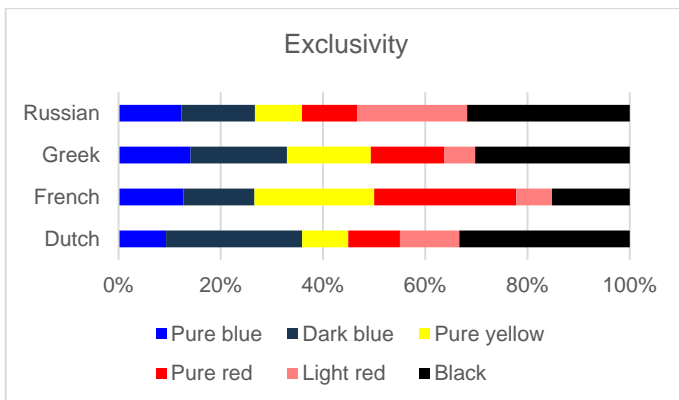


Figure 4. Colour associations and exclusivity.

The proportion of exclusivity associations with black reported by the French respondents (15%) was remarkably lower compared to the proportion in the other three cultural groups: Dutch (33%); Russian (33%); and Greek (30%). Once again, separate chi-square tests were performed. There was a statistically significant relationship between cultural groups and the exclusivity–colour profile: $\chi^2 (15) = 119,208$; $p < 0.001$; $\phi = 0.181$. No significant relation was found between gender and colour for exclusivity: $\chi^2 (5) = 3.94$; $p = 0.558$.

4. Discussion

This study has investigated universal and culturally specific patterns of colour associations, examining their impact on emotion, trust, and exclusivity as pertaining to Dutch, French, Greek, and Russian cultures. Gender differentiations could only be pinpointed for the colour light red; women associated relatively more trust with

light red compared to men. Across these four cultural groups, the following global similarities in colour associations were found:

- Red was the colour of emotion; specifically, pure red was associated more with emotion compared with a lighter variation of the colour.
- Blue was the colour related to trust, whereby pure blue was associated more with trust than a darker variation of blue.
- The most exclusive colour was black, followed by dark blue.

Some local culturally specific associations were reflected in that pure red was associated relatively more with emotion by the Dutch and Greek cultural groups (vs. French and Russian). In addition, pure blue was associated more with trust by the Dutch and French cultural groups (vs. Greek and Russian). Pure yellow was a noticeable colour associated with emotion by the Russian group. With respect to the colour yellow, a prior cross-country investigation by Jonauskaitė *et al.* (2016) found that the least preferred hue is yellow. In contrast, a prior cross-cultural investigation by Broeder and Scherp (2017) found that yellow is the most persuasive colour for online use in e-commerce. Recently, Gribet *et al.* (2021) provided an intergenerational linguistic analysis of the Russian colour-vocabulary, including the Russian terms for referring to the colour yellow. They noted that historic changes in the sociocultural (Soviet/Russian) reality affected the colour-vocabulary and colour-naming patterns. It can be anticipated that the colour yellow has negative emotional association for Russians. This assumption needs to be explored further.

This study has limitations that give rise to some suggestions for further research. First, the colour patches were presented in an online questionnaire with the participants asked to select one patch from the series of six coloured pictures. Factors such as the lighting of the (computer monitor) environment were not considered. This might have created a confounding variable. In this respect, Jonauskaitė *et al.* (2020) found that colour–emotion associations differed between elicitation with colour terms or colour patches in their experiments. There existed high similarity patterns between the two elicitation types for a set of colours including red, blue, and yellow, but not for the (exclusive) colours black and purple. The colour term black elicited more negative associations compared with the colour patch black.

Second, and further elaborating on the previous limitation, the participants in this study reported basic unipolar colour associations, i.e., the valence aspect

(positive or negative) of each concept was not considered. Further, cross-cultural investigations might explore the bipolarity of colour associations for the three concepts focused on in the present study. For instance, the emotional valence of red is more likely negative (danger, warning) in Western cultures and positive (good fortune, prosperity) in Chinese cultures. Specifically, in contrast to Western stock exchange markets, red represents up-markets whereas green represents down-markets (Jiang *et al.*, 2021). In addition, the strength of specific colour associations might be related to other culturally specific values, such as uncertainty avoidance. For instance, based on recent empirical cross-cultural investigations by Broeder (2022), it is a reasonable conjecture that the influence of blue on trust will be stronger in higher uncertainty-avoidance cultures (such as Greece and France) compared to lower uncertainty-avoidance cultures (such as Russia and the Netherlands). In a similar vein, based on the degree of culturally specific individualism (Hofstede, 2022), it can be assumed that the exclusivity of black and dark blue will be more prominent in collectivistic cultures (such as Greece and Russia) compared to individualistic cultures (such as the Netherlands and France).

Third, it is important to keep in mind that in this study, the colours were presented isolated from context. Specifically, Martinez *et al.* (2021) noted that, in a retail environment, product and store colours cannot be considered standalone variables. For example, they observed that, in a mock-up blue retail environment, chocolate with a red package was considered more attractive and had higher purchase intentions, compared to blue and beige packaged colours. In contrast, in an orange retail environment, orange packaged chocolate was preferred. In a similar vein, Bakker *et al.* (2015) found different colour preferences among the Dutch: white was preferred in residential and office environments; however, black was mentioned as the favourite colour for clothing (more by females than males).

5. Conclusion

In general, the findings of this study suggest colour variations that are specifically associated with emotion (red), trust (blue), and exclusivity (black). In addition, some specific differentiations relate to the brightness dimension affecting the potential of a colour association. In this study pure red (vs. light red) was reported to be associated relatively more with emotion. Pure blue (vs. dark blue) was reported to be associated more with trust. These differentiations seem to be culturally independent from the colour–attitude combinations (red–emotion and

blue–trust) that were explored in the current study. Further cross-cultural investigations of colours-in-context (Elliot and Maier, 2012) might reveal the underlying determinants from which colour associations and preferences originate (for references, see Gedron, 2017; MacDonald *et al.*, 2018; Witzel, 2019).

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7. Declaration of conflict of interest

The author has declared that no competing interests exist.

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9. Short author biography

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References

- Adams, F. M. and Osgood, C. E. (1973) 'A cross-cultural study of the affective meanings of color'. *Journal of Cross-Cultural Psychology*, 4(2), pp.135–156. doi: 10.1177/002202217300400201.
- AL-Ayash, A. et al. (2016) 'The influence of color on student emotion, heart rate, and performance in learning environments'. *Color Research & Application*, 41(2), pp. 196–205. doi: 10.1002/col.21949.
- Aslam, M. M. (2006) 'Are you selling the right colour? A cross-cultural review of colour as a marketing cue', *Journal of Marketing Communications*, 12(1), pp. 15–30. doi: 10.1080/13527260500247827.
- Bakker, I. et al. (2015) 'Color preferences for different topics in connection to personal characteristics'. *Color Research & Application*, 40(1), pp. 62–71. doi: 10.1002/col.21845.
- Broeder, P. (2022) 'The moderating effects of age and gender on the relationship between culture and uncertainty avoidance: Evidence from Europe and Asia', *Journal of the Academy of Business and Emerging Markets*, 2(1), pp. 3–18. doi: 10.5281/zenodo.6330561.
- Broeder, P. and Scherp, E. (2017) 'Colour preference of online consumers: a cross-cultural perspective', *Marketing from Information to Decision Journal*, 1(1), pp. 53–62. doi:10.2478/midj-2018-0001.
- Broeder, P. and Snijder, H. (2019) 'Colour in online advertising: Going for trust, which blue is a must?', *Marketing from Information to Decision Journal*, 2(1), pp. 5–15. doi: 10.2478/midj-2019-0001.
- Broeder, P. and Wildeman, N. (2020) 'The colour red for emotion in cross-cultural e-commerce'. *Eurasian Journal of Business and Economics*, 13(25), pp. 75–89. doi: 10.17015/ejbe.2020.025.05.
- Choi, J. et al. (2020) 'Opposites attract: Impact of background colour on effectiveness of emotional charity appeals'. *International Journal of Research in Marketing*, 37(3), pp. 644–660. doi: 10.1016/j.ijresmar.2020.02.001.
- Chou, H. Y. et al. (2020) 'What should we call this colour? The influence of colour-naming on consumers' attitude toward the product'. *Psychology & Marketing*, 37(7), pp. 942–960. doi: 10.1002/mar.21351.
- Clarke, T. and Costall, A. (2008) 'The emotional connotations of colour: A qualitative investigation'. *Color Research & Application*, 33(5), pp. 406–410. doi: 10.1002/col.20435.
- Cyr, D., Head, M. and Larios, H. (2010) 'Colour appeal in website design within and across cultures: A multi-method evaluation'. *International Journal of Human-Computer Studies*, 68(1/2), pp. 1–21. doi: 10.1016/j.ijhcs.2009.08.005.
- Elliot, A. J. and Maier, M. A. (2012) 'Color-in-context theory'. *Advances in Experimental Social Psychology*, 45, pp. 61–125. doi: 10.1016/B978-0-12-394286-9.00002-0.
- Elliot, A. J. and Maier, M. A. (2014) 'Color psychology: Effects of perceiving colour on psychological functioning in humans'. *Annual Review of Psychology*, 65, pp. 95–120. doi: 10.1146/annurev-psych-010213-115035.
- Fraser, T. and Banks, A. (2004) *Designer's Color Manual: The Complete Guide to Color Theory and Application*. Chronicle Books.
- Gedron, M. (2017). Revisiting diversity: Cultural variation reveals the constructed nature of emotion perception. *'Current Opinion in Psychology'* 17, 145–150. doi: 10.1016/j.copsyc.2017.07.014.
- Gorn, G. J. et al. (1997) 'Effects of color as an executional cue in advertising: They're in the shade'. *Management Science*, 43(10), pp. 1387–1400. doi: 10.1287/mnsc.43.10.1387.
- Gorn, G. J. et al. (2004) 'Waiting for the web: How screen color affects time perception'. *Journal of Marketing Research*, 41(2), pp. 215–225. doi: 10.1509/jmkr.41.2.215.28668.
- Griber, Y. A., Mylonas, D., and Paramei, G. V. (2021) 'Intergenerational differences in Russian color naming in the globalized era: linguistic analysis'. *Humanities and Social Sciences Communications*, 8(1), pp. 1–19. doi: 10.1057/s41599-021-00943-2.
- Hofstede, G. (2022) 'Country Comparison'. Retrieved from www.hofstede-insights.com.
- Jiang, F., Zhang, R. and Lu, S. (2021). 'Red and risk preferences: The effects of culture and individual differences'. *Journal of Behavioral Decision Making*, 34(5), pp. 625–638. doi: 10.1002/bdm.2233.
- Jonauskaitė, D. et al. (2016) 'Most and least preferred colours differ according to object context: new insights from an unrestricted colour range'. *PLoS One*, 11(3), pp. 1–22. doi: 10.1371/journal.pone.0152194.
- Jonauskaitė, D. et al. (2019) 'The sun is no fun without rain: physical environments affect how we feel about yellow across 55 countries'. *Journal of Environmental Psychology*, 66, pp. 1–7. doi: 10.1016/j.jenvp.2019.101350.
- Jonauskaitė, D. et al. (2020) 'Feeling blue or seeing red? Similar patterns of emotion associations with colour patches and colour terms'. *i-Perception*, 11(1), pp. 1–24. doi: 10.1177/2041669520902484.
- Kim, D., Hyun, H. and Park, J. (2020) 'The effect of interior color on customers' aesthetic perception, emotion, and behavior in the luxury service'. *Journal of Retailing and Consumer Services* 57, pp. 1–10. doi: 10.1016/j.jretconser.2020.102252.
- Kodžoman, D. et al. (2022). 'Exploring color attractiveness and its relevance to fashion'. *Color Research & Application*, 47(1), pp. 182–193. doi: 10.1002/col.22705.
- Koo, D. M. and Ju, S. H. (2010) 'The interactional effects of atmospherics and perceptual curiosity on emotions and online shopping intention'. *Computers in Human Behaviour*, 26(3), pp. 377–388. doi: 10.1016/j.chb.2009.11.009.
- Kuzinas, A. et al. (2016) 'The effects of image hue and semantic content on viewer's emotional self-reports, pupil size, eye movements, and skin conductance response', *Psychology of Aesthetics, Creativity, and the Arts*, 10(3), pp. 360–371. doi: 10.1037/a0040274.
- Labrecque, L. I. and Milne, G. R. (2012) 'Exciting red and competent blue: the importance of colour in marketing'. *Journal of the Academy of Marketing Science*, 40(5), pp. 711–727. doi: 10.1007/s11747-010-0245y.
- Labrecque, L. I., Patrick, V. M. and Milne, G. R. (2013) 'The marketers' prismatic palette: A review of colour research and future directions', *Psychology & Marketing*, 30(2), pp. 187–202. doi: 10.1002/mar.20597.
- Labrecque, L. I. (2020) 'Color research in marketing: Theoretical and technical considerations for conducting rigorous and impactful colour research', *Psychology & Marketing*, 37(7), pp. 855–863. doi: 10.1002/mar.21359.
- Lee, H. and Lee, E. (2021) 'Effects of coloured lighting on pleasure and arousal in relation to cultural differences'. *Lighting Research & Technology*, pp. 1–18. doi: 10.1177/1477153521999592.
- Lee, Y. J. and Lee, J. (2006) 'The development of an emotion model based on colour combinations'. *International Journal of Consumer Studies*, 30(2), pp. 122–136. doi: 10.1111/j.1470-6431.2005.00457.
- MacDonald, L. W., Biggam, C. P. and Paramei, G. V. (Eds.). (2018) *Progress in colour studies: cognition, language and beyond*. Amsterdam: John Benjamins Publishing Company.

- Madden, T. J., Hewett, K. and Roth, M. S. (2000) 'Managing images in different cultures: A cross-national study of colour meanings and preferences'. *Journal of International Marketing*, 8(4), pp. 90–107. doi: 10.1509/jimk.8.4.90.19795.
- Magnini, V. and Kim, S. (2016) 'The influences of restaurant menu font style, background colour, and physical weight on consumers' perceptions'. *International Journal of Hospitality Management* 53, pp. 42–48. doi: 10.1016/j.ijhm.2015.11.001.
- Mazaheri, E., Richard, M. O. and Laroche, M. (2011) 'Online consumer behaviour: Comparing Canadian and Chinese website visitors'. *Journal of Business Research*, 64(9), pp. 958–965. doi: 10.1016/j.jbusres.2010.11.018.
- Martinez, L. M. et al. (2021) 'True colours: Consumers' packaging choices depend on the colour of retail environment'. *Journal of Retailing and Consumer Services*, 59, pp. 1–13. doi: 10.1016/j.jretconser.2020.102372.
- Mohr, C. et al. (2018) 'Unifying research on colour and emotion: Time for a cross-cultural survey on emotion associations to colour terms'. In L. W. MacDonald, C. P. Biggam, & G. V. Paramei (Eds.), *Progress in colour studies: Cognition, language and beyond* (pp. 209–221). John Benjamins. doi: 10.1075/z.217.11.moh.
- Mummalaneni, V. (2005) 'An empirical investigation of website characteristics, consumer emotional states and on-line shopping behaviours'. *Journal of Business Research*, 58(4), pp. 526–532. doi: 10.1016/S0148-2963(03)00143-7.
- Ou, L. C. et al. (2018) 'Universal models of colour emotion and colour harmony'. *Color Research & Application*, 43(5), 736–748. doi: 10.1002/col.22243.
- Poels, K. and Dewitte, S. (2008) 'Getting a line on print ads: Pleasure and arousal reactions reveal an implicit advertising mechanism'. *Journal of Advertising*, 37(4), pp. 63–74. doi: 10.2753/joa0091-3367370405.
- Roschk, H., Loureiro, S. M. C. and Breitsohl, J. (2017) 'Calibrating 30 years of experimental research: a meta-analysis of the atmospheric effects of music, scent, and color'. *Journal of Retailing*, 93(2), pp. 228–240. doi: 10.1016/j.jretai.2016.10.001.
- Seckler, M., Opwis, K. and Tuch, A. N. (2015) 'Linking objective design factors with subjective aesthetics: An experimental study on how structure and color of websites affect the facets of users' visual aesthetic perception'. *Computers in Human Behavior*, 49, 375–389. doi: 10.1016/j.chb.2015.02.056
- Song, Y., Luximon, Y. and Luo, J. (2020) 'A moderated mediation analysis of the effect of lettering case and color temperature on trustworthiness perceptions and investment decisions'. *International Journal of Bank Marketing*, 38(4), pp. 987–1005. doi: 10.1108/IJBM-09-2019-0315.
- Su, L., Cui, A. P. and Walsh, M. F. (2019) 'Trustworthy blue or untrustworthy red: the influence of colors on trust'. *Journal of Marketing Theory and Practice*, 27(3), pp. 269–281. doi: 10.1080/10696679.2019.1616560.
- Wilms, L., and Oberfeld, D. (2018) 'Color and emotion: effects of hue, saturation, and brightness'. *Psychological Research*, 82(5), pp. 896–914. doi: 10.1007/s00426-017-0880-8.
- Witzel, C. (2019) 'Misconceptions about colour categories'. *Review of Philosophy and Psychology*, 10(3), pp. 499–540. doi: 10.1007/s13164-018-0404-5
- Witzel, C., Maule, J. and Franklin, A. (2019) 'Red, yellow, green, and blue are not particularly colorful' *Journal of Vision*, 14(27), pp. 1–26. doi: 10.1167/19.14.27.
- Yi, E. and Shamey, R. (2015) 'Cross-cultural comparison of color terms and preference of persimmon-dyed fabric, Galchon'. *Color Research & Application*, 40(6). doi: 10.1002/col.21941.
- Yildirim, K., Cagatay, K. and Ayalp, N. (2015) 'Effect of wall colour on the perception of classrooms'. *Indoor and Built Environment*, 24 (5), pp. 607–616. doi: 10.1177/1420326X14526214.