

Cultural influence through colour could change human preferences in design

Prof. Prashant S. Acharya

Faculty of Art & Design,
Department of Design,
Vishwakarma University, Pune, Maharashtra,

Abstract:

Colour plays a vital and often underestimated role in user interface design. Beyond aesthetics it directly influences how users perceive information, experience emotion and make decisions while interacting with design. Every hue shade and contrast contributes to shaping the overall user experience guiding attention creating hierarchy and establishing trust while psychological and marketing research has long explored the emotional and behavioural effects of colour, the meanings people attach to colours are not universal they are deeply shaped by cultural backgrounds, traditions and shared social experiences. In one culture a colour may evoke warmth and celebration, while in other it may signify danger. Such differences demonstrate how cultural context can significantly alter user preferences in design .as technology becomes increasingly global, designers could recognize that a single colour scheme cannot always communicate effectively across diverse cultural audiences. This paper explores how cultural meanings influence human responses to colour in design. It brings together perspectives from colour psychology, cultural semiotics, and human computer interaction to build a more inclusive understanding of design perception. However, there is a necessity and scope to differentiate colour, application/utility and its meaning.

Keywords: Colour, psychology, culture, influence, user interface, design, cross-cultural, preference, perception.

Introduction:

Colour is one of the most powerful tools a designer can use to communicate meaning and emotion. It helps establish visual hierarchy, guide user attention, signal interactivity, and express a brand's personality. The colour in design does more than adding aesthetic; rather, it shapes how users read information, navigate, and emotionally connect with it. The right colour choice can enhance clarity and trust, similarly the wrong ones may lead to confusion and discomfort.

However, the meaning of colour is far from universal. People do not interpret colours in isolation; they understand it through their culture. Across societies colours have symbolic meanings because of history, religion, environment and tradition. For example, white represents purity, yellow is associated with happiness and optimism and blue is linked with calmness and tranquillity.

These symbolic associations don't come from nowhere; they evolve over time and are constantly reiterated by our daily rituals, media, fashion trends, and institutional use of colour in public life. This necessarily means designers across cultures must approach colour as a language unto itself-a sign system whose meaning can change according to who does the interpreting.

These associations subtly shape how users respond to design experiences.

As technology continues to reach worldwide, it has become very important for designers to understand how cultural differences influence colour preferences. A colour palette that feels warm and trustworthy to a specific audience might seem dull and unsettling to another to design interfaces that feel intuitive and inclusive, creators can look beyond aesthetics and consider the deeper cultural context that shapes perception.

What feels like a calm and trustworthy colour to one audience may feel dull or even unsettling to another. By looking beyond aesthetics for the deeper cultural context informing perception, creators can design more intuitive and inclusive interfaces.

Colour also plays a significant role in determining how much time users will put their concentration into. While warm colours like red or yellow catch attention of viewers sooner, cooler colours like blue and green are capable of holding attention for long by giving a calm and balanced atmosphere. Too much brightness or colour contrast overloads the viewers' attention and lessens the span of concentration. The right use of colour contrast steers the eye naturally toward important elements, improving readability and attention span to remain focused for longer in the design.

Methodology:

Quantitative Research:

Previous research shows. Colour preferences differ across cultures:

Research shows a measurable difference in colour preferences across cultures:

- India and Southeast Asia – Higher preference of warm, bright and saturated colours like reds orange and golds.
- Japan and East Asia – Higher preferences of cool, muted harmonious colours like blues, greens, neutrals like white beige etc.
- Western cultures like US, Europe – Balanced preference for blue and green and strongly dislike for overly saturated palettes.
- Middle East – Preferences for rich tones and high contrast.

Colour resonated with trust across cultures:

- Blue scored high consistently along a lot of cultures
- Red showed quite a variation: High trust in China low trust in western contexts
- Greens scored high in western contexts but was seen as prosperous in South Asian context.

Task performance changes with colour:

- Users from cultures familiar with bright colours completed tasks 5-12 % faster when interfaces used warm tones.
- Japanese participants performed better with low saturated and cool pellets with fewer pallets and less hesitations.
- Western participants did not show any major performance difference but rated designs with such colours distracting

Emotional response ratings with different cultures:

- Red and Gold palettes were rated exiting and happy by East and south Asian users but alarming and intense by many western users
- Yellow was seen joyful in south Asia but inappropriate for formal apps in Japan and Europe.

Qualitative Research:

Based on articles and previous research

Warm Colours -Red, Yellow, Orange

India

This deep red reminds me of my grandmother's sari during weddings.

Reference: Cultural symbolism of red in Indian weddings

Bright yellow reminds me of Basant Panchami.

Reference: Festival colour symbolism

China:

Red reminds me of New Year it means luck.

Reference: Red as prosperity in Chinese culture

Western Countries

Bright red feels like danger alarms and stops signs.

Reference: Western danger signalling & colour psychology

Cool Colours - Blue, Green, Purple

Japan:

Blue feels peaceful, like early morning sea.

Reference: Japanese cultural colour preferences

Sweden:

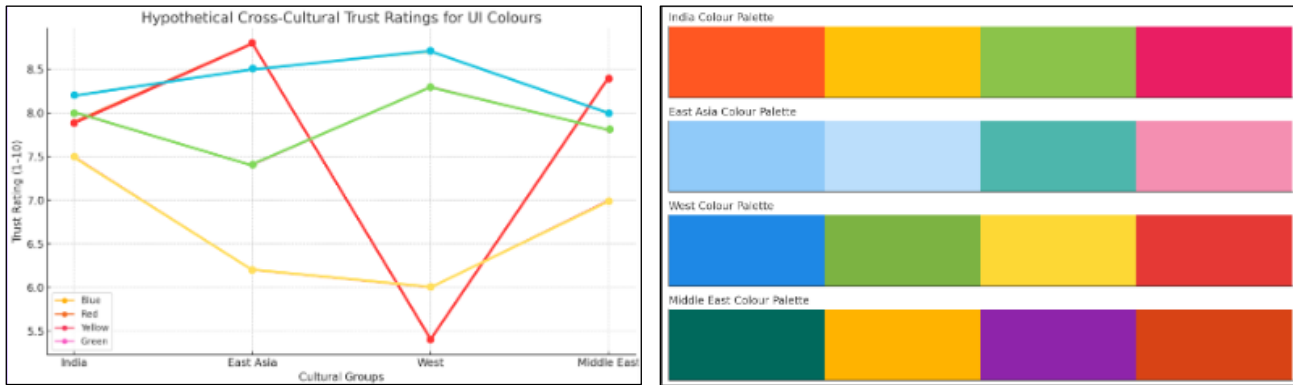
Green reminds me of nature, of forests.

Reference: Scandinavian environmental colour meaning

USA:

Dark blue feels like a trustworthy banking colour.

Reference: Blue and trust in Western branding



Literature review:

In their critical review Sokolova and Fernández-Caballero (2015) explore in detail how colour functions within affective interaction and computer designs, with particular attention to cultural and demographic moderators. The authors point out that though some emotional reactions to colour may indeed be shared across cultures, interpretation and preferences nevertheless show important cultural differences. (p.462). they write, among other examples Sakamoto's survey of the Netherlands, Japan, Vietnam and China, which found that the Dutch listed blue green and red as their favourites while Japanese participants more frequently chose pink ,pale green and blue (Sakamoto as cited in Sokolova & Fernández-Caballero, 2015, p. 461).

It also underlines the results from Ou, Luo, Woodcock & Wright, 2012, conducted in eight countries, including the UK, Taiwan, France, Germany, Spain, Sweden, Argentina, and Iran. In these, many semantic emotional pairs (warm/cool, heavy/light, active/passive) presented similar trends, while responses varied in intensity and nuance among cultural groups. According to Sokolova & Fernández-Caballero (2015, p. 463), though the warm/cool dimension is universally understood, for instance, the threshold at which a hue would feel "warm" changes from region to region, a fact which indicates that the emotional tone of colour is mediated by the cultural context.

The authors make a point of the fact that in the domain of HCI and affective computing, cultural backgrounds have to be factored into colour design, since "colour is less about universal signals than about culturally-tuned cues" (Sokolova & Fernández-Caballero, 2015, p. 467). While some things are universal, like basic emotions, the mappings between colours and emotions and preference hierarchies cannot be taken as applicable worldwide. As the authors say, "Although there are common cross-national trends in colour perception, the usage of some particular colours for people from specific cultures or regions should be taken with caution" (Sokolova & Fernández-Caballero, 2015, p. 485).

Finally, the following review underlines demographic and cultural interactions: older observers tend to prefer colours with higher chroma (that is, of a more saturated character), while younger observers prefer less bright tones (Sokolova & Fernández-Caballero, 2015, p. 472). According to this interplay of age, culture, and colour preference, design decisions cannot be based on hue itself, but must take into account cultural age groups, regional norms, and local meaning systems.

In a nutshell, this review by Sokolova & Fernández-Caballero (2015) consolidates the important point that while colour effects exist, the meaning and impact of these are importantly modified by the cultural prism through which they are perceived. For the design of UIs, this means palette choices should be informed by culture, rather than assumed to be universal.

Reference Sokolova, M. V., & Fernández-Caballero, A. (2015). A review on the role of colour and light in affective computing. *Applied Sciences*, 5(3), 275–293. <https://doi.org/10.3390/app5030275>

Dayananda (2025) argues that colour is a central UI element whose interpretation and effectiveness are mediated by cultural values and communication styles. In his review of foundational cultural theories (e.g., Hofstede, Trompenaars, Hall), Dayananda links specific cultural dimensions-such as high-context vs. low-context communication, uncertainty avoidance, and indulgence vs. restraint-to likely preferences for colour tone, saturation, and expressiveness in interfaces. For example, interfaces targeted at high-context cultures may benefit from richer, more symbolic palettes that align with implicit visual cues; whereas interfaces for low-context cultures should favour clearer, functionally driven colour cues which prioritize legibility and explicit affordance (Dayananda, 2025). This synthesis by Dayananda underlines the design implication that colour choices are not merely aesthetic, but communicative acts which must be aligned with local cultural meaning systems.

This framing in Dayananda aligns with prior empirical and theoretical work showing that colour-emotion mappings and preference hierarchies vary across societies. Cross-cultural studies find that while some broad tendencies such as the association of blue with calm/trust appear widely, the intensity and contextual meaning of hues differ by culture. Dayananda builds on such findings by linking them to interaction design: where colour choices conflict with locally learned symbolism, for instance, by using white in contexts where it connotes mourning, interfaces risk undermining perceived trust, appropriateness, or emotional fit. This echoes Cyr's demonstration that the attractiveness of colour and cultural congruence predict web trust and satisfaction across regions.

Conclusion:

This research paper has highlighted that colours in a design play a far more importance than just visual styling and aesthetics, Colours are culturally embedded way of communication that shapes how people feel, understand and trust in design. Psychological research has shown consistent links between colour and emotion; this paper brings to light that colour meanings and preferences are deeply influenced buy cultural contexts. A colour that signals excitement celebration or safety in one society may carry a very different or even opposite meaning in another.

Designers can benefit from treating colour both functional and semiotic. Practical strategies of this include maintaining core colours for universal interactions.

Ultimately designing with cultural sensitivity is not simply for avoiding misinterpretation it is about creating experiences that acknowledge user's identities strengthen trust and foster a sense of belonging.

Future Implications:

1. Culturally aware more can be made like dark mode
2. Design systems in the coming future can have balanced personalization with ethics, making sure colour choices and adaptations are inclusive and optional and not based on rigid assumptions regarding culture
3. Designs can be region-specific focusing on localized content
4. More collaboration with cultural experts and consulting with them before creating a specific design can be done.
5. Global design teams can be culturally diverse they can hire ux designers from multiple cultures.
6. Sacred and taboo colours can be respected while creating design
7. In ui colour may shift subtly during interactions to match cultural emotional responses
8. Design teams can work with the local communities and ask for their preferences

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