

## DEVELOPMENT AND VALIDATION OF THE INFLUENCE OF COLORS ON EMOTIONS SCALE

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DOI: <https://doi.org/10.5281/zenodo.17589281>

Received  
20 September 2025

Accepted  
30 October 2025

Published  
12 November 2025

### ABSTRACT

This study developed the Indigenous Colour Emotion Scale (ICES) through a two-phase process. In the first phase, an original pool of 49 items was developed from eight in-depth, semi-structured interviews (n = 4 males, n = 4 females). The pool of items was administered to a sample of 300 young adults (age 18–32; M = 26, SD = 4.31), and these young adults represented numerous geographical areas in District Jhang. In the second phase, a psychometric evaluation was conducted on the scale. A principal factor analysis revealed a three-factor structure which distinguished between factors related to the psychological effects of colour, colour effects on mood, and emotional/symbolic associations. These factors had Cronbach's alpha reliabilities of .52, .53, and .57, and the scale overall was reliable with a score of .70. Overall, the scale can serve as a resource for understanding how colours may affect the emotional aspects of youth's behaviour.

**Keywords:** Influence of Colours, Psychological, Emotional and Symbolic Effects.

### INTRODUCTION

Colour is an essential component within design as it serves various human processes, and it is a vital channel for designers across industries such as advertising, architecture, and product design to engage the emotional state of their audience. There is plenty of evidence to indicate humans make connections of specific colours with emotions; for instance, red is associated with excitement and green is linked to nature and rebirth. The research literature in this area has largely considered two main areas of inquiry: one is the descriptive features of colour (i.e., warm/cool, dark/bright), and the other is their individual colour preferences (like/dislike). The studies have employed semantic differential scales and have used paired descriptors (i.e., prefer-detest, dynamic/static, happy-depressing) to describe these descriptive and preferential qualities. The research concludes that there are

attributes of colour that have little or no emotional impact, but there are others that have significant influence. Coupled with this research is the desire to investigate what connects human perception to the colour offerings of stimuli, typically examining some of the mediating variables. The mediating variables of interest include stimulus context, in terms of size and material, as well as ambient lighting, and observer variables of gender, age, and cultural background or location (Gong, 2017).

Visual colour perception is defined by its basic attributes: hue, saturation, and brightness. Hue is the perceived attribute that distinguishes colours as red, green, and blue, while brightness is defined by a perceived degree of light emitted or reflected by the colour (Maund, 2024). Similarly, a person's personality involves their unique long-standing patterns of thought, emotion, and behaviour. Personality can be

construed as the active psychophysical organisation determining where, how, and when the individual typically shifts and adjusts to their environment - there are reliable tendencies across situations. These attributes are important aspects for understanding human individuality as they govern social behaviour, motives, and emotionality, which enable the description and prediction of behavioural distinctions.

Individual difference principles also extend to learning, where the effectiveness of learning is dependent on the recognition that students think and learn in different ways. Therefore, if learning is indeed knowledge creation and retention, the emphasis of instructional design should be on flexible approaches. Osei (2023) also emphasised that the most efficient teaching strategies are designed to be responsive to the needs and characteristics of the learner.

The emotional associations of colour form the foundation for its classification into warm (e.g., red, orange, yellow) and cool (e.g., blue, green, purple) categories. Warm colours are generally thought to represent energy/vibrancy, while cool colours are often ascribed attributes of calmness/serenity (Stávek, 2023). Expertise in this dimension of colour theory allows designers and artists to make purposeful colour decisions, design attractive visual layouts and intentionally influence viewer emotion, making colour a medium through which notices can enhance aesthetic communication.

Given this established emotional impact, we feel that the role of colour could hold a place in therapeutic contexts. This paper reviews the relevant literature to assess the potential contribution of colour therapy for mental health. Studies that were relevant to this topic suggest that while chromatic stimuli can have some therapeutic value, the effects of colour therapy are individualised. The moderating effects of individual experiences and culture will influence how one interacts with colour. As such, colour therapy should not be seen as a treatment for mental illness on its own, but it may have some promise along with other personalised treatment approaches (Lyu, 2022).

The dichromatic reflection model argues that light reflected from a surface is a linear combination of two distinct components: body (diffuse) reflection and interface (specular) reflection. Originally developed by Shafer for

inhomogeneous dielectric materials, this model has served as a cognitive base for computer graphics and computer vision, for assistance in image rendering as well as object detection. In this context, the body reflection component represents the object's intrinsic colour, while the interface reflection component represents the illuminant's spectral properties. Thus, any one colour value on a uniform object surface can be represented as a linear combination of the body colour vector and illumination colour vector. Research by Tominaga and Wandell has provided a means to assess whether this is warranted (Shoji, 2021).

Human colour vision is a highly sophisticated and advanced function. Humans and some primates are classified as trichromats and possess a visual system with the capacity to discriminate more than 2.3 million colours, due in part to a sensitivity to the red part of the spectrum that distinguishes them from most dichromatic mammals (Jacobs, 2008; Pointer & Attridge, 1998). This may have provided an evolutionary advantage in foraging (Osorio et al., 2004). However, current investigations inspired by colour-in-context theory suggest that the colour red has profound implications for psychological functioning (Elliot, 2015; Elliot & Maier, 2014).

For example, exposure to colour red in testing environments disrupts performance in cognitive tasks (Elliot et al., 2007). This study (Daniel, 2019) builds on this research by positing that the same inherent mechanism can also hurt self-assessment ratings, which we investigated empirically.

Apart from basic perception, colour has an important function as a vehicle for symbolic communication (having a clear influence on consumer emotion and perception as it pertains to marketing) (Labrecque & Milne, 2012). Although it is clear that colour is important, the academic literature on colour has largely been isolated studies, and there is a high degree of uncertainty in studies of colour and brand personality is an area of research that has been especially nascent and underdeveloped. This study aims to create an empirically grounded approach to identify and map associative patterns between colours and specific brand personality characteristics. We argue for the hypothesis that there are consistent associative patterns that can be substantiated through

empirical evidence. If the relationship of colours and brand personality is verified, the results would not only have an empirical foundation, but they could translate into a design tool with much potential for academic and practitioner use - across marketing, product design and product manufacturing contexts (Maya, 2017). Based on visual marketing cues, consumers ascribe personality traits to fashion brands, utilising colour cues as a primary tool for communicating personality features. This study (Jessica, 2013) addressed whether people exposed to a brand logo would ascribe personality characteristics according to known colour associations. Hypotheses were tested employing a survey of participants across the country. Results support brand personality characteristics based on specific colours, providing evidence that colour has symbolic properties that can act as a heuristic for brand personality. Thus, a planned understanding of colour interpretation permits a marketer to more effectively shape their visual identity with a potential brand personality trait.

Colour greatly impacts human psychology by influencing emotions, moods and perceptual assessments. The communicative potential of colour comes from its polysemic nature; it is a range of possibilities of meaning rather than a static bestowal of meaning. Colour in consumer settings, therefore, is not effective in a silo, but as part of a complex semiotic system in which colour interacts with other signs to shape the overall product experience. Its communicative potential to direct consumer perception, emotion and purchase intention renders colour an important variable in the development of marketing and advertising strategy. Nevertheless, colour, like other signs, may be ineffectual as a marketing tool due to individual differences, namely demographic background, culture, gender, age, and personality. Collectively, these factors complicate the application of colour from a strategic perspective and often require a nuanced and purposeful strategy to use colour effectively (Srivastava, 2011).

The meaning of colours may differ among cultures, and historically speaking colours have changed significance, but researchers have shown that colours consistently exert psychological and behavioural effects. While colours saturate human experience, humans are

often unaware of this profound impact, even as it relates to athletic performance and hunger. Blue environments contribute to increased athletic performance; however, blue is a strong appetite suppressor, which is a mechanism food scientists claim may be an evolutionary adaptation for avoiding blue or purple poisonous foods (Johnson, 2013). Therefore, red is intentionally used in restaurants to stimulate appetite.

This connection between colour and affect manifests in social perception. The current study (Takei, 2022) examined whether metaphoric connections between colours and emotions (yellow-happiness; blue or grey-sadness) would enhance the recognition of corresponding facial expressions and if this occurred when the colour and face were presented in close spatiotemporal proximity. Within a two-experiment design, participants categorised happy or sad faces presented with a background coloured either yellow, grey or blue. Analyses of response times revealed a significant facilitation effect only for the yellow-happiness association and only when the face and colour were presented simultaneously. Conversely, a change in background colour to blue or grey did not affect the recognition of sad facial expressions. This study highlights that colour-emotion associations are not universally facilitating, and that colour affective associations on social-emotional judgment demonstrate a sensitive temporal period of co-occurrence that the valence will depend upon the proximity of occurrences.

Research suggests that colour has an implicit role in branding, which requires managers to carefully think about the colour of the products and the corporation to adequately attract consumers. This helps to create a defined range to find a proposed venue for future inquiry (Rehman, 2018).

Colour acts as a filter for human perception and behaviour in context. Color has a large influence on psychological constructs, cognition, and decision-making at all life stages of the whole life. It is clear, even in early infancy, that colour preferences are noted in infants as young as three months and trends through their own developmental processes. Some responses may be innate, while others may be acquired through cultural or conditioning processes of the

environment. For example, cool colours are likely preferred for their calming nature as opposed to warm colours that are much more stimulating. In the end, colour is a subtle yet powerful element of graphic design, and it is critically implicated in branding, advertising, and packaging (Rider, 2009).

In everyday situations, people select clothes to purchase and wear based on what people perceive clothes can communicate about social meanings or associations with an article of clothing. This review provides a brief overview of more than twenty studies to assess what is known about the communication function of dress. In particular, the review discusses three key themes: socio-psychological effects of clothing, clothing (in)equality issues by gender, and the implications of colour in clothing psychology. The review concludes with a brief discussion of contemporary fashion shows and trends, and explores global labels. Ultimately, appearance and dress undeniably factor into social communication and the process of socialisation (Kodžoman, 2019).

Colour has, in fact, a lot of communicative strength. Studies show us that we form our first impressions of objects or people within 90 seconds, clarifying that between 62% and 90% of our first impressions are based solely on colour. Deliberate choice of colour design creates a distinction between products and competitors while controlling perceptions by manipulating feelings and emotions in people, good and bad. For managers, understanding colour as an aspect of marketing is vital to their success, as colour can have a drastic effect on our psychological experiences and cognitive understandings of reality. This paper seeks to enhance the discussion around this powerful word (Singh, 2006).

### **Aims and Objectives**

#### **This study aimed to:**

1. To develop an indigenous scale measuring the influence of colours on emotions.
2. To validate an indigenous scale measuring the influence of colours on emotions.

### **Method**

The Influence of Colours on Emotions Scale (ICES) was developed and validated in two phases. Phase I involved developing and piloting

the item pool derived from interviews with young adults. Phase II, then, evaluated the psychometric properties of the scale.

### **Construction and Validation of the Influence of Colours on Emotions Scale (ICES)**

In the first phase, we prepared an interview guide that was developed with a research supervisor. Following this, interviews were conducted with eight young adults (n=4 males, n=4 females) aged between 18-32 years. In this phase, an Urdu version of the Influence of Colours on Emotions Scale (ICES) was developed (Urdu is the national language of Pakistan). The second phase consisted of testing the factor structure of the scale along with its reliability.

### **Interview Questions**

An interview checklist was created based on previous studies to meet the aims of the research. Thereafter, eight participants were interviewed individually. Before each interview began, participants were given a full overview of the study's aims and were assured that their data would remain anonymous and confidential. The researcher also indicated that their data would only be used for research purposes. Participants were encouraged to share their authentic views and opinions about the effects of colours on their feelings. Each interview lasted 20-25 minutes, and all interviews were conducted individually and audio-recorded. Audio recordings were transcribed for analysis after the interviews were completed.

### **Generation of Item Pool for Influence of Colours on Emotions Scale (ICES)**

A focus group was utilised to remove duplicate items and validate face and content validity. The group was comprised of five highly qualified experts, including three MPhil degree holders, one PhD student, and one PhD holder. All experts had significant expertise and prior experience in creating psychometric tests. Following the experts' evaluations, duplicate or unnecessary items were either deleted or eliminated from the scale. The experts' recommendations also guided the wording of specific items. The experts established the scale's design, particularly the 5-point Likert-type response design (ranging from "Strongly

Disagree” to “Strongly Agree”). Following this process of item finalisation, the Influence of Colours on Emotions Scale (ICES) was ready for implementation.

**Determining Psychometric Properties of Influence of Colours on Emotions Scale (ICES)**

In the second phase, the objective was to determine a factorial framework using reliability analysis and exploratory factor analysis.

**Factor Structure and reliability analysis:**

In the second phase of developing the scale, we focused on the factor structure and the scale's reliability. We assessed the final scale's factor structure using Principal Component Analysis (PCA) with Oblique (direct oblimin) rotation. We utilised a scree plot to determine the factor retention, which is recommended when sample sizes are over 200. The Eigenvalues for the first three factors were over 1, indicating they can be retained.

We assessed the scale's internal consistency with a reliability analysis, which indicated a high level of homogeneity of the items. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .8, which is above the recommendation and supports the use of factor analysis. All extracted

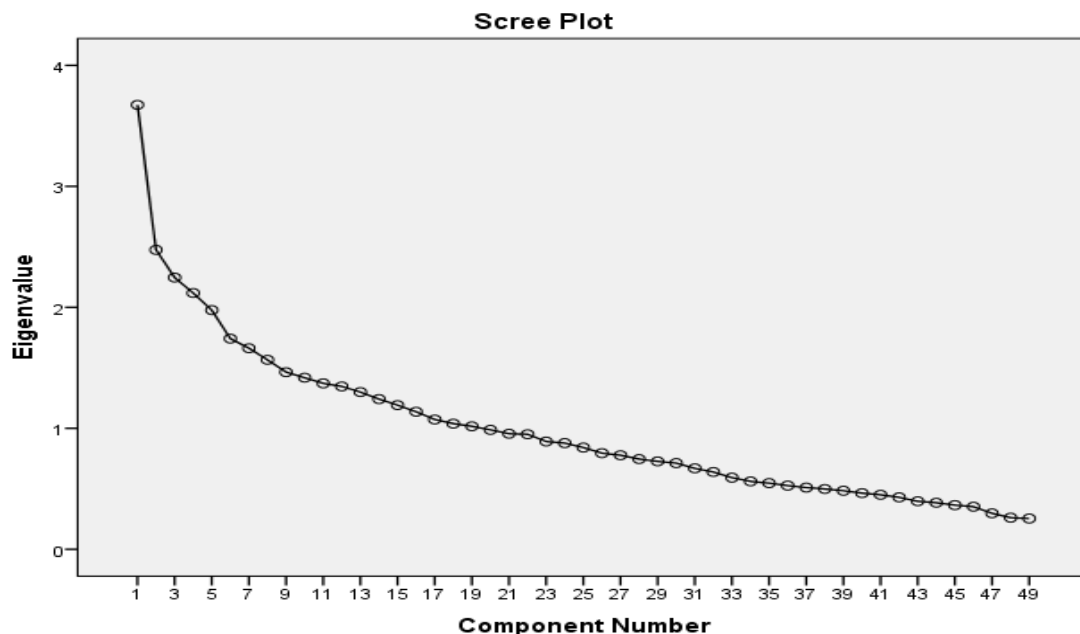
communalities were above .7, indicating that each item shared sufficient variance with the other items.

Figure 1 scree plot indicates the variables' extraction. Principal component analysis was performed using the three components that the scree plot revealed. The selection of items for the subscales was based on the requirement that they had factor loadings of .35. The table shows the factor loadings of the scale's 49 statements on three factors using Oblimin Rotation.

**Scoring and Interpretation**

Responses were collected using a five-point Likert scale, which was scored from (1) totally disagree to (5) totally agree. The original pool of 49 items was reduced to a final scale with 15 items—a conclusion stipulated by the accepted operations in scale development. The total score will be the sum of the items, which can range from 15 to 75, with higher scores indicating a stronger perceived influence of colour on emotions. Acceptable internal consistency was demonstrated on the scale, with a Cronbach's alpha of = .70. This scale consists of three subscales, which will be described below with scoring and interpretation information.

Figure 1. Scree diagram illustrating the factor extraction for Colours Influence Emotions



**Factor 1: Psychological effects of colours:**  
 Factor 1 is the Psychological effects of colour. It included 5 items and has a .52 reliability. This scale

has a score range of 6 (minimum) to 20 (maximum), including items 1-5.

**Factor 2: Effects of colours on mood:**

Factor 2 is the Effects of colours on mood. It included 5 items and has a .53 reliability. This scale score has 5 (minimum) to 20 (maximum), including items 6-10.

**Factor 3: Emotional and symbolic association:**

The factor 3 is the Emotional and symbolic association. It included 5 items and has a .57 reliability. The score range on this scale is from 6 (minimum) to 16 (maximum), including items 11-15.

**Table 1**

**Factor Loading for Exploratory Factor Analysis with Oblimin Rotation of Influence of Colours on Emotions Scale (ICES)**

Sr. No.	Statements	1	2	3	Corrected Total Item Correlation
1	زرد رنگ کے استعمال سے مجھ میں مشکل حالات سے لڑنے کا حوصلہ پیدا ہوتا ہے۔	.46			.18
2	اچھے اور موزوں رنگوں کے انتخاب سے میری زندگی خوش گوار گزر رہی ہے۔	.45			.24
3	رنگ میری روحانی کیفیت پر اثر انداز ہوتے ہیں	.45			.25
4	اپنے پسندیدہ رنگوں کے استعمال سے مجھے ڈپریشن سے نجات ملتی ہے۔	.45			.29
5	سبز رنگ میرے سکون کا باعث بنتا ہے۔	.41			.29
6	میرے خیال میں رنگوں کا مناسب استعمال مجھے خوش دل بناتا ہے۔		.66		.21
7	کچھ رنگوں کا استعمال مجھے قوت عطا کرتا ہے۔		.50		.24
8	سفید رنگ کی استعمال مجھے پاکیزگی کا احساس دلاتا ہے۔		.49		.28
9	مجھے لگتا ہے مختلف رنگوں کا مجھ پر مختلف اثر پڑتا ہے۔		.49		.19
10	رنگوں کی دلکشی مجھ پر گہرے اثرات چھوڑتی ہے۔		.41		.27
11	بھورا رنگ میرے اندر مستقل مزاجی پیدا کرتا ہے۔			.60	.07
12	جامنی رنگ میرے اندر خود اعتمادی پیدا کرتا ہے۔			.59	.16
13	نارنجی رنگ میری جسمانی اور جذباتی توانائی میں اضافہ کرتا ہے۔			.59	.04
14	سرخ رنگ کا استعمال مجھے خوف میں مبتلا کر دیتا ہے۔			.45	.20
15	ایک ہی رنگ کی مجھ پر مستقل/یکساں اثرات ہوتے ہیں۔			.43	.20
	Eigen Value	3.67	2.47	2.24	
	Of Variance %	7.47	5.05	4.58	
	Cumulative % of variance	7.47	12.54	17.13	
	Scale Reliability=.70	.52	.53	.57	

Note: factor Loadings  $\geq .35$

**Table 2**

**Correlation of Influence of Colours on Emotions Scale (ICES)**

Variables	Psychological effects of colours	Effects of colours on mood	Emotional and Symbolic association	Influence of Colours on Emotions
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Psychological effects of colours	-	.23**	.29**	.60**
Effects of colours on mood	-	-	.13*	.56**
Emotional and Symbolic association	-	-	-	.50**
	-	-	-	-

Table 2 indicates that Correlation is significant at the 0.05 level; all three factors (Psychological effects of colours, Effects of colours on mood and Emotional and symbolic Association) have a strong positive correlation with one another as well as the scale's overall score.

**Table 3**  
**Descriptives of Colours Influence Emotions Scale (CIES)**

Factors	<i>M</i>	<i>SD</i>	<i>A</i>
Psychological Effects of Colours	11.16	3.33	.52
Effects of colours on mood	10.48	2.98	.53
Emotional and Symbolic Association	11.04	3.47	.57
Colours Influence Emotions Scale	32.69	6.18	.70

Table 3 indicates Cronbach's alpha, mean and Standard Deviation of the Influence of Colours on Emotions Scale (ICES). It represents the satisfactory internal consistency for subscales (Psychological effects of colours, Effects of colours on mood, Emotional and symbolic association).

### Discussion

Colour attributes refer to characteristics of visual perception, such as hue, saturation, and brightness. Hue refers to the perception of a colour denoted by terms such as yellow, red, or blue. Brightness refers to the perceived intensity of a visual stimulus (Maund, 2024).

This investigation, in conjunction with previous studies, supports a strong correlation between colour and emotion. The main purpose of this study was to provide a better understanding of the effects of colours on emotions. Principal factor analysis showed a three-dimensional structure with adequate reliability, including psychological effects of colours, effects of colours on moods, and emotional/symbolic associations. These three factors were significantly intercorrelated, demonstrating the use of the scale as a screening tool to assess colour-related emotions.

Moreover, the results examine the potential moderating structure of colour categories in the relationship between life satisfaction and mood.

This has multiple implications in areas such as marketing and therapy, where a more informative understanding of colour could contribute to creating a more positive space and more effective therapeutic interventions. This study also provides individual-level consideration for harnessing specific colour preferences towards improved well-being. Nonetheless, the limitations of the study, such as the short time span and the small sample size, offer much potential for subsequent research on a larger scale in future studies. The results, despite these limitations, suggest that young adults and communities can take these lessons and create more emotionally mindful contexts (Simra, 2024). This research was based on the assumption that university students experience a statistically significant relationship between colour perception and emotions. This assumption was demonstrated by the current results, along with past studies, that identified a statistically significant positive correlation between the two.

The literature supports these results. Birren (2006) demonstrated that colours induce several qualities of emotion (e.g. warmth, strength, calmness), based on the perceptual characteristics of each. High illumination combined with low absorption produces a soft feeling; for example, certain combinations produce feelings of hardness or firmness. He also asserted that low contrast, less

saturated colours imply calmness; brightness indicates activity. Warm colours (for example, red and yellow) are associated with more emotional stimulation than cooler range colours (for example, green and blue). Building on this, Sevinc Kurt (2014) would characterise red as evoking power, fire, and attraction.

To elaborate on this, research has indicated that if students have an awareness of colour-emotion relationships, they may better understand and authentically express feelings. The use of colour is also linked to personality traits. There is a notable distinction between students preferring non-colour (e.g., brown, grey, black) and colour (e.g., red, yellow) contexts. Colour preference typically suggests increased social tendencies, while a preference for non-colour may be associated with social aloofness or neuroticism. The colour preference is then associated with increased aggression and energy. This association, while representative of the individual, aligns with colour-emotion research and the premise of some studies (e.g., Juliet, 2022). Studies continue to imply correlations between the attributes associated with colour with the appropriateness of hues to illuminate aspects of self-identity.

### Implications

This research adds to the existing research related to how colours affect people's emotions in general, and any validity related to emotion colour comparisons should be addressed in supplementary validation studies to fully validate these findings. Additionally, this study serves as a foundation for other investigations that can examine any other variables which may mediate or moderate the emotional effects of colour. In addition to the research findings, educational events such as public lectures and seminars could contribute to community engagement and raise awareness about the importance of colour psychology in everyday life.

### Limitations and Suggestions

There are a few limitations to this study. First, the data were collected solely from District Jhang, which may impose significant limitations on the findings' generalizability. Second, a self-report questionnaire was used, which opens a possibility for response bias, as the results could be affected by individual differences in the way that participants understood and responded to the items.

Although the findings from this specific cultural context add value to the field, future studies are encouraged to examine their relevance across different populations and countries. Furthermore, future studies are encouraged to investigate the impact of colours on emotions that humans experience in daily and real-life contexts. Expanding research on colour in this manner would bolster the theoretical understanding of colour psychology and further the usefulness of the findings for applications in the realms of design, marketing, and well-being.

### Funding Statement

This was a self-funded project and did not receive any external funding.

### Conflict of Interest

The authors do not have any conflicts of interest to declare.

### Ethical Standards Statement

The study was conducted after getting approval from the Board of Studies (BOS) of the Department of Psychology, University of Jhang, Jhang, Pakistan. Informed consent was obtained from all participants, who also permitted us to publish the study's findings anonymously.

### Acknowledgements

The authors want to acknowledge all the participants for their interest and taking the time out for this study.

### REFERENCES

- Andrade, M. E. (2014). The colors of emotion. *American Ethnologist* is an international journal.
- Asumi Takei, S. I. (2022). Effects of color-emotion association on facial expression judgments. *Heliyon*.
- Avery, G. A. (2016). The color of emotion: A metric for implicit color associations. *Food Quality and Preference*.
- Johnson, D. (2013). Do different colors affect your mood? *Psychology of Color*.

- Juliet,. (2022, 12 19). NLM. Retrieved 8 19, 2024, from Front Psychol: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9806338/#:~:text=Those%20with%20high%20agreeableness%20preferred,to%20new%20experiences%20preferred>
- kaya, E. (2004). Relationship between color and emotion: A study of college students. Collage student journal.
- Kodžoman, D. (2019). THE PSYCHOLOGY OF CLOTHING: Meaning of Colors, Body Image and Gender Expression in Fashion. Textile & Leather Review.
- Lisa, D. O. (2018). Color and emotion: effects of hue, saturation, and brightness. inviting submission across all areas of psychology.
- Maier, A. J. (2014). Color Psychology: Effects of Perceiving Color on Psychological Functioning in Humans. Annual Review of Psychology.
- Mark, M. T.-&. (2010). Colors and Emotions: Preferences and Combinations. The journal of General Psychology.
- Maud, B. (2024). Color. The Stanford Encyclopedia of Philosophy .
- Michael, H. (2010). A Note on Adults' Color-Emotion Associations. The Journal of Genetic Psychology .
- Rehman, H. A. (2018). Color Psychology in Marketing. Journal of Business & Tourism.
- Rider, T. S. (2009). Color Psychology and Graphic Design Applications. COLOR PSYCHOLOGY.
- Rui Gong. (2017). Investigation on factors to influence color emotion and color preference responses. Optik.
- Sevinc Kurt. (2014). The Effects of Color on the Moods of College Students. Sage Journals .
- Singh, S. (2006). Impact of color on marketing. Emerald insight discover journals.
- Srivastava, N. S. (2011). Impact of Colors on the Psychology of Marketing – A Comprehensive over View. Management and Labour Study..