Color application in vernacular architecture in Southern India: An Intangible cultural phenomenon?

Marcelo Schellini [a], School of Design, VIT University, Vellore, India

Ali Rahimi [b][1], VIT University, School of Social Sciences and Languages, India

Abstract

The study of color aesthetics should always consider color interactions. This study aimed to understand the color application in southern India by identifying it in the cityscapes and analyzing its characteristics. Field observations, a survey, and interviews were undertaken. An online questionnaire was administered to 39 undergraduate and master's degree students in Industrial Design courses at VIT University Vellore. The article discusses the appropriate methodology for color criticism research and its multidisciplinary field. The study concludes that color in Southern India has a complex and elaborated application. Color contrast and saturation can be used not merely to enhance and distinguish shapes and forms creating the visual effect of detachment between its elements but as a paradoxical economic status indicator.

Keywords: Architecture; Color; Criticism; Design; India; Visual Culture.

* ADDRESS FOR CORRESPONDENCE: Ali Rahimi, VIT University Vellore, Address, VIT Quarters, Vellore, Tamil Nadu, 632014, India
 E-mail address: alirahimiedu@gmail.com / Tel.: +918870472667

1. Introduction

Up to the second half of the nineteenth century, the color application was linked to the extraction of natural pigments and dyes from nature. Due to chemical industry development, which started producing synthetic colorants that would replace natural dyes in different sectors of production, a new palette of colors would become possible for a large application and usage. Before that, a predominantly white city could denote the proximity or abundance of limestone resources as is observed in some locations in the Indian western Himalayas towns (Joshi & Rawat, 2019). Another example of traditional colored cities linked to the availability of natural resources is Marrakesh, in North Africa. The ancient city that is well known for its red salmon walls and buildings maintains its ancient color tradition that comes from the simplest material of architecture - red soil. Landmarks such as mosques, fortifications, minarets, squares, and monuments found inside the kasbah all follow the design principle of Tabia, which is the mixture of water and red mud from the Hazou plains.

The availability of natural dyes used to be one of the key aspects that could influence the architectural color design and consequently the identity of cityscapes (Smith, 2019). The age of synthetic colorants will somehow detach the principles of color application based on natural resources and extend it to multiple possibilities. Nevertheless, as color is a remarkable feature of cities' uniqueness, it is observed that some cities and towns have given up the application of polychromy to preserve their identity. In India, municipalities such as Jodhpur which is known to be the "blue city" due to its indigo-washed houses, have encouraged its dwellers to preserve their historical identity by not painting the buildings in different colors. In Jodhpur, a synthetic painting could denote a menace capable of breaking down a tradition that has been maintained by generations. That fact involves public concern once the replacement by other colors would ultimately distort its original cityscape, the preservation of the original color assures its local heritage and an economy that relies on the color feature of the "blue city" as a tourist destination.

Colors in cities are far from a simple decorative element in the cityscape. Architectural color creates and reveals the identity of a place. Indeed, color applications distinguish cities from each other. Equally, color is one of the most significant aspects linked with the sense of place, it is a defining feature that influences people's experience within a particular location. As one of the common functions of color is to distinguish between objects of the same kind, color is applied to enhance the differentiation and uniqueness of places. In other words, it plays an important role in creating emotional links between places and their identities (Jie Xu, 2016).

However, the presence of a color in the architecture has never been necessarily restricted to the local availability of natural dyes and other color resources. The trade of dyes is an ancient commercial practice. Besides, the availability and commercial values of a dye influenced the cognitive meanings of colors in numerous societies. Cultural meanings were to an extent merged with other economic aspects of color. The blue color - for instance - for many centuries in southern Europe denoted a foreigner and the eastern color as lapis lazuli was a mineral commonly imported from deposits in present-day Iran and Afghanistan. The precious minerals that were laboriously purified and imported to be used by European painters under the name of the *ultramarine* color, as it implies, from "over the seas" (Ball, 2012). Likewise, a variety of indigo dyes derived from plants were imported from Asia and Africa, especially

from India. Throughout centuries in Europe, despite being extracted from leaves, indigo was known as the Indian stone (Pastoureau, 2001).

1.1. Related research

According to Albers (1963), the study of color aesthetics should always consider color interactions. As it occurs in musical compositions, single tones are unable to render musical melodies. Musical perception depends on the recognition of the in-between tones and the relative placing on time. Likewise, colors are always related in a continuous flux, interacting among themselves, changing, influencing, and being influenced by other colors. Albers's (1963) color experiments show that the same color on two different backgrounds presents quite different visual appearances. As socio-cultural contexts are not simple frameworks for color identity analyses, it has to be closely integrated whenever we try to understand their complexities. Therefore, Albers's aesthetic principle of color interaction should be extended as a broad multidisciplinary concept of research including anthropology and visual culture studies.

1.2. Purpose of study

The present research endeavors to weave the complex interface existing between color and Indian culture through manifestations of its southern vernacular architecture and visual culture.

Research Questions:

1. How is the color application in India?
2. What are the color application's features of the vernacular architecture in Southern India?
3. How can we conduct research on color?
4. What is the relevance of cultural and social studies for color analysis?

2. Materials and Methods
2.1. Participants

Considering the large extension of Indian territory and the diversity of its cultures and communities, this research has restricted its focus to the Southern Indian states (Tamil Nadu, Andra Pradesh, and Kerala) where field observation and interviews were undertaken. Initially, the researchers employed an online questionnaire and administered it to 39 UG and master's degree students in Industrial Design courses at VIT University Vellore. These students were mostly residents of Southern Indian states of different social classes and religious backgrounds.

2.2. Data collection instrument

Every one of the participants answered the same online questionnaire three times. The research also conducted interviews with their family members and neighbors, therefore, analyzing three different houses of their locations regarding their aspects of color applications. Along with the online questionnaire, students were requested to photograph the facades of the related houses. Secondly, four showroom paintings and sellers of the local small shops were also interviewed by the researchers.

Both online questionnaires and interviews aimed to analyze the users' preferences of colors, the most sold shades for interiors/exteriors, and the color applications regarding their saturation and dilution.

Likewise, the data collection aimed to demonstrate socio-cultural motivations that lead to color preferences and their subsequent applications.

2.3. Data analysis

Afterward, the researchers analyzed the data collected through the online questionnaires, interviews, and photographic documentation comparing and contrasting it with the reading sources and visual cultural references to Indian color criticism. By interacting the data collection with the social-cultural contexts the researchers were able to verify the credibility of the theoretical assumptions and elaborate on further relations within the field of color criticism.

3. Results

The data generated by online questionnaires, interviews, and photographic documentation have demonstrated a wide range of color applications and preferences. According to painting showroom sellers of the region of Vellore (Tamil Nadu), Valley Green 7511, Inkjet 7327 (Cyan), Sands of Time 4202, Cotton Wool L104, and Buttercup-N 0336 are the most sold colors for exteriors.

Figure 1
Valley Green 7511, Inkjet 7327 (Cyan) Sands of Time 4202, and Cotton Wool L104 are among the most sold colors for exteriors according to asiapaint sellers.

Source: https://www.asianpaints.com
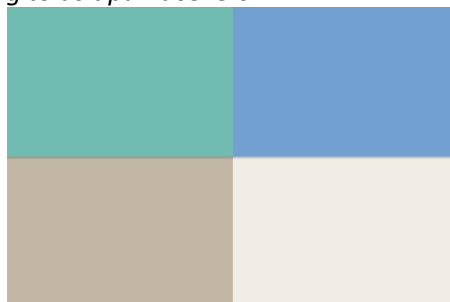
The online questionnaire, interviews, and photographic documentation have demonstrated that often users have not applied the same colors to the exterior facade and interior rooms. There is a common practice to alternate two or more shades in the entire building. According to painting showroom sellers of the region of Vellore (Tamil Nadu), Baby Blush 8138 (Pink) is one of the most sold colors for interiors.

Figure 2
Baby Blush 8138 (Pink) is among the most sold colors for interiors according to asiapaint sellers.

Source: https://www.asianpaints.com

Despite showroom sellers' indicated colors, the online questionnaire unveils a broader diversity of people's preferences. Due to this fact, given the difficulty to identify a single or even a group of colors that could establish a color pattern in the cityscape, the definition of the Southern Indian vernacular architecture's color identity requires a complex analysis of its heterogeneous features**.**

Rather than identifying the predominance of a single color, both field observation and online questionnaire demonstrated features related to the color composition and its matching color designs. The first feature noticed and analyzed is the use of polychromy in the house facades, which is to say, a single facade building can present a large number of shades creating a unique and prolific color composition.

Figure 3
Houses in the region of Vellore, Tamil Nadu, India

Note: House painted with polychromatic eight different shades as such as Cyan (R:132, G:182, B:219), Lime-Green (R:183, G:188, B:44), Yellow (R:223, G:192, B:52), Dark Green (R:85, G:145, B:164), Salmon (R:222, G:159, B:150), Orange (R:223, G:150, B:105), Cream (R:226, G:215, B:197), White (R:255, G:255, B:255).

In the same vein as polychromatic compositions, it was possible to notice a large application of secondary and tertiary saturated colors. All these secondary and tertiary colors are arranged in a myriad of geometric shapes, positive and negative spaces, bosses, and furrows rendering tridimensionality to their design.

Figure 4
Houses in the region of Vellore, Tamil Nadu, India.

Note: Two houses were painted with secondary and tertiary colors such as Magenta (R:175, G:68, B:103), Violet (R:110, G:93, B:178), Light Orange (R:221, G:170, B:72)

The same geometric experimentalism is also noticed in other color compositions among those that present complementary colors. In a large number of facades, it was possible to identify contrasting complementary colors that enhance the shapes and forms that link the vernacular architectural design to the colorful traditional expressions such as Indian folk paintings, decorative patterns, and textiles.

Figure 5

Houses in the region of Vellore, Tamil Nadu, India.

Note: Houses are painted with complementary colors such as Violet (R:143, G:64, B:100) Yellow (R:208, G:181, B:112), Cyan (R:55, G:81, B:134) Orange (R:184, G:111, B:76)

The online questionnaire and interviews also have demonstrated that the color preferences of residential houses are largely defined by their owners. The wide variety of colorful designs and compositions applied in vernacular southern Indian architecture unveils the versatility of preferences and a high degree of personalization of the residential spaces. The extension of this decision is not limited to the choice of a single color but a complex manifestation of color compositions and designs.

4. Discussion

Color identity is by no means simply defined by monochromatic contexts. Beyond the "red, pink, and blue cities," color aesthetics are expressed in the most complex and multifaceted characteristics. Another eminent feature that defines color identity is the large variability of the application of polychromy. In an attempt to understand the color application in India, Kaimal (2011) analyses South Asian paintings and sculptures of different archaeological monuments. Focusing on ancient monuments

such as Ajanta Caves and Kanchipuram Temple, she discusses whether polychromy has been largely applied even before the introduction of synthetic paints in India. Kaimal (2011) assumes that the exuberant colors - applied in the second half of the twentieth century to the ancient, towered gates (Gopuras) at South Indian temples - were not merely a twentieth-century innovation or an alienating aesthetic forged by synthetic paints.

Moreover, *Color and Sculpture in South Asia*'s article reflect controversial perceptions of color application in India. Kaimal (2011) relates - in a first-person testimony - how she had underestimated the profusely colored towers as if they were a falsification of the remote monochromatic pre-colonial past imagined by her. The article rectifies controversial assumptions that temples were not originally colorful but tawny sandstone monochromes. According to Kaimal (2011), this fact has been the result of the Indian Archaeological Survey's standard practice of scrubbing plaster and paintings from archaeological sites and museum artifacts in the late 1980s. The idealization of a monochrome pre-colonial despised the application of polychromy regarding it as provincial, childlike, and unsophisticated practice.

Kaimal's endeavor to understand the color application in India unfolds, in its turn, numerous other questions such as how color aesthetics is perceived by a particular socio-cultural context. The biased approach towards polychromy denotes that the preconceived notion of "provincial color sense" could be related to the socio-cultural friction caused by the colonial period. By the late Nineteenth century, color aesthetics triggered disputes and controversies between colonial agencies and subaltern resistance in India; as imperial officials were condemning Indian artists, artisans, and the population at large for their lack of a developed "color sense" (Eaton, 2013).

Furthermore, during the Indian independence struggle against British colonialism, color aesthetics was used as a political device by artists of the Swadeshi Art movement. A great deal of concern was directed towards what should be the palette of colors used by such an art movement that prioritized domestic production and boycotted the foreigner agency. Ancient treatises and recipes of color production were vitalized, and it potentially fostered a large production of artworks and texts in which color is a notable subject (Eaton, 2014). Several artworks of the Swadeshi Art movement were applied directly to architectural elements in the form of masterpieces of frescos and murals as those painted by Nandalal Bose in the porticos and walls inside Kirti Mandir in Vadodara, a city in the Indian state of Gujarat.

Nevertheless - emphasizing how color is an object able to unfold contradictions; the same Indian application of colors that caused repulse to some Britons, on the other hand, produced admiration for other British artists that had turned to Indian application of colors as a secret knowledge that should be absorbed to refine their impoverished incipient industrial design and architecture. Indeed, Indian color's inimitability fostered troublesome antagonism in Victorian society. The Indian arts and crafts section displayed in the Crystal Palace during the Great Exhibition of 1851 will present the Indian color application as an appealing aesthetic able to rescue and rejuvenate British fatigued or vexed artistic practices (Eaton, 2013).

Traditionally, the eastern color application is imagined and glimpsed throughout a long period of cultural exchanges. Ball (2012) has suggested that during the High Renaissance in Europe, color aesthetic achievements were linked to the major port of Venice which used to be the European gateway for the influx of eastern spices, textiles, and pigments. In such an environment, with the availability of new

materials, the Venetian workshops fostered colorists such as Titian and others that played an important role in the creation of a new color palette in the European history of art.

Throughout the cultural and commercial exchanges between western and eastern countries, India has a privileged place within color representations. Among the dyes and pigments that were largely used in Europe before the synthetic colorants significantly were those imported from India. As mentioned before, Indian indigo was extensively demanded by the textile dye European industry until the nineteenth century. In India, such demand generated harsh conditions of labor, the fraudulent British deals, and the impoverishment of local farmers as much of the peasant population broke out in an uprising, better known as the Indigo Rebellion, which contributed to one of the early nationalist movements in India (Eaton, 2013). Likewise, the Indian yellow came to be a popular pigment used by European painters. Imported by the Dutch Eastern Trade Company and applied by Rembrandt among others (Ball, 2012).

Post-colonial artists such as Raghubir Singh kept applying color as a central concern in his artistic production. Internationally acclaimed as one of the pioneers of fine art color photography (Westerbeck, 1989), Raghubir Singh extols chromatic symbolism and color consecrating its universe as an element essential to life in India (Singh, 2006; Jie Xu, 2016). The photographic artwork of Raghubir Singh extends the legacy of color in the history of Indian Arts to our present days.

The controversies related to color are impossible to be understood without the socio-cultural phenomenon analysis. What makes the color a complex (polysemic) object of research is that individuals conceive it as influenced by socio-cultural cognitions. The perception of a given color is juxtaposed with socio-cultural assumptions. Therefore; it is a society that "creates" a color, explains it, and gives it its meaning. Likewise, it is the same society that establishes the uses and conventions of how to apply and combine them (Pastoureau, 2001; Kaimal, 2011; Schellini, 2021). As color connotation is first and foremost a socio-cultural phenomenon - which is intrinsically associated with its context - it resists generalizations. Still, unfortunately, the existence of articles and research studies demonstrating color's connotations in universal archetypal terms is prevalent.

By and large, polychromy encompasses a wide range of variables that enhances the complexities of color identity analyses. The range of colors circumscribes multiple characteristics such as hue, saturation, contrast, hierarchy (primary, secondary, and tertiary), complementarity, and harmony. Therefore, polychromy application can epitomize not simply how socio-cultural phenomena influence the color meaning but also reflect its aesthetic possibilities and preferences. Once again, "color sense" cannot be scrutinized by general rules or formulas if the analysis is stripped of its socio-cultural contexts.

5. Conclusion

The study aimed to understand the color application in southern India by identifying it in the cityscapes and analyzing its characteristics. It was observed that polychromy application is a recurrent feature in cityscapes. In its accelerated phenomenon of urbanization, the original landscape has been drastically transformed by the proliferation of two-story houses and small buildings. Noted especially in the city's outskirts and villages, the design of these new constructions is not subjected to urban council regulations hence individual color preferences were expressed at large .

The heterogeneous features of the color application present in its facades are remarkable. The heightened chromatic palette, a wide variety of saturated colors, contrasting compositions, and complementary color combinations render the visual environment into complex analysis. Furthermore, such a heterogeneous application in the visual environment turns it into a difficult task to identify a single prominent color as a representative of its color scape. Rather, it suggests that the common feature that weaves the cityscapes in Southern India is, above all, the application of polychromy.

The polychromy applied in the towered gateways (Gopuras) of temples in Southern India has the particular function to render the mythological figures more readable and visible, even if observed from a distant point of view. Complementary colors presenting stark contrasts can enhance and distinguish shapes and forms creating the visual effect of detachment between its elements. Similar color applications observed in the design of the towering gateways are also found in the recent secular two-story houses and small buildings in the Southern Indian villages and cityscapes.

The preferences of the saturated and contrasted shades have the function to distinguish the architectural object from its environment following the principle of detachment between figure and background. The interviews with showroom painting sellers have disclosed the social preference for saturated colors. According to them, the preference for "darken colors" is observed among villagers and working-class people, who is to say, darken colors mean saturated shades non-diluted with water. Economically, the less diluted paint application is more expensive, therefore it could denote the economic strength of its owner and family. Nevertheless, the popularity of "darken colors," in its turn, is less noticed among privileged classes.

It concludes that color in Southern India has a complex and elaborated application. Color contrast and saturation can be used not merely to enhance and distinguish shapes and forms creating the visual effect of detachment between its elements but as a paradoxical economic status indicator. Indeed, there are many more factors still to be observed on the complexities of color in southern India, an object of study that fascinates as much as it challenges academic researchers.

6. Recommendations

The following questions can be investigated as suggestions for further research:
To what extent can religion influence color preferences and applications in India?
To what extent can religion influence color preferences and applications in different countries?
What is the role of gender in color preferences and applications?
What is the role of ethnic background in color preference and applications?
What is the relationship between educational background and color preference and applications?
What is the interface between social class and color preference and applications?
How can color be investigated without stereotypes and generalizations?
How can color be used as a political strategy concerning hegemony and subaltern issues?

Acknowledgement

also acknowledge Dr Djamil Ben Ghida for all his suggestions and collaboration in the design of the research questionnaire.

References

Albers J (1963), *Interaction of Color,* London, Yale University Press.https://yalebooks.yale.edu/book/9780300179354/interaction-color

Ball P. (2012), The Invention of Colour*,* Worcester, *Interfaces* (33).https://www.holycross.edu/sites/default/files/files/interfaces/ball.pdf

Eaton N (2013), *Colour, Art and Empire: Visual culture and the nomadism of representation*, New York, I.B. Tauris. https://doi.org/10.1080/00856401.2015.993012

Eaton N (2014), Swadeshi Color: Artistic Production and Indian Nationalism, ca. 1905–ca. 1947. *The Art Bulletin*, 95:4, 623-641. https://doi.org/10.1080/00043079.2013.10786096

Jie Xu J. (2016). How Colour Defines Local Identity: A Comparative Case Study Of London And Shanghai [Doctoral Dissertation, School of the Arts, English, and Drama, Loughborough University].http://dx.doi.org/10.13140/RG.2.2.32728.70403

Kaimal P. (2011). Color and Sculpture in South Asia.: Notes in the History of Art, Vol. 30, No. 3, *Special Issue: Superficial? Approaches To Painted Sculpture,* pp. 33-39. Chicago, University of Chicago Press. https://doi.org/10.1086/sou.30.3.23208559

Joshi, N. C., & Rawat, G. S. (2020). Why only blue in the traditional architecture of western Himalaya, India? *Color Research & Application*, *45*(1), 95-104.https://doi.org/10.1002/col.22440.

Pastoureau M. (2001). Blue: the history of a color. New Jersey, Princeton University Press.https://press.princeton.edu/books/hardcover/9780691181363/blue

Schellini M. (2021), "The Peacock Junction". *GIS - Gesto, Imagem E Som - Revista De Antropologia* 6 (1). São Paulo, Brasil: e-178043. https://doi.org/10.11606/issn.2525-3123.gis.2021.178043.

Singh R. (2006), *River of Colour: The India of Raghubir Singh* (2nd ed.). London, Phaidon Press. https://collectordaily.com/book-river-of-colour-the-india-of-raghubir-singh/

Westerbeck C., Greenough S., Snyder J. and Travis D. (1989). *On the Art of Fixing a Shadow: One Hundred and Fifty Years of Photography,* Los Angeles, Library of Congress. https://www.nga.gov/exhibitions/1989/shadow.html

Smith, D. (2019). Colourful questions of an Indian village. *Color Research & Application*, *44*(4), 581-594. https://onlinelibrary.wiley.com/doi/abs/10.1002/col.22364

Appendix A
(Sample of a painting showroom seller interview)

Q. What are the available paints on the market?
A. We work with Asian paints such as Apex, Apcolite, and Tractor.

Q. What is the best-selling color paint?
A. The most sold color is Baby Blush 8138 (Pink), it is used for interiors.

Q. What is the best-selling color paint for the exterior?
A. The most sold color for exteriors is Valley Green 7511.

Q. What are the top five best-selling color paints for the exterior?
A. Valley Green 7511, Inkjet 7327 (Cyan), Sands of Time 4202, Cotton Wool L104, and Buttercup-N 0336.

Q. Do you see any specific color preference connected to social classes?
A. Yes, village people prefer "darken" color (saturated), on the other hand, city people prefer lighten colors. The darkened colors are more expensive because they are less diluted, in villages having a darkened color house is a sign of prestige.

Q. Do you see any specific color preference connected to gender?
A. What I see here is that men and women always differ regarding the color they come to buy.

Appendix B
(Students Questionnaire**)**

Housing Analysis: Color Design
Student ID Number *
House *

☐ 1

☐ 2

☐ 3

Zip Code (Location) *

1. Religion of house owners *

☐ Hinduism

☐ Christianity

☐ Islam

☐ Jain

☐ Sikhism

☐ Buddhism

☐ Other

2. Level of education *

☐ Elementary school

☐ Middle school

☐ High school

☐ Bachelor's degree (University)

☐ Master's degree

☐ PhD

2. Profession of the house owner *

☐ Employee

☐ Worker

☐ Self-employed

☐ Retired

☐ Other

3. Number of floors *

☐ 1 Floor

☐ 2 Floors

☐ 3 Floors

☐ 4 Floors or more

4. Number of Rooms *

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5 or more

5. Number of family members (living in the house) *

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7 or more

6. Colors selections *

1-Strongly disagree

2-Disagree

3-Neutral

4-Agree

5-Strongly agree

☐ Facade colors were selected by the architect

☐ Facade colors were selected by the construction contractor/painter

☐ I selected colors by myself

☐ Colors have been selected according to what was available in the paint shop

☐ Colors have been selected according to Vastu Shastra

☐ Colors have been selected according to their meaning

☐ Colors have been selected according to (local) cultural traditions

☐ Paints were selected randomly

☐ Facade colors were selected by the architect

☐ Facade colors were selected by the construction contractor/painter

☐ I selected colors by myself

☐ Colors have been selected according to what was available in the paint shop

☐ Colors have been selected according to Vastu Shastra

☐ Colors have been selected according to their meaning

☐ Colors have been selected according to (local) cultural traditions

☐ Paints were selected randomly

7. Reasons for colors selections and choices *

8. Is there any particular tradition (cultural or religion) commonly used in this locality related to the use of paint colors on houses? *

9. Did you use the same colors for interiors? and what are these colors? *

10. Did you use any specific color for a specific space in your house? for example the living room or kitchen *

11. Colors used in Facade - use the PANTONE selector website to define the # color codes