Comfortable environment: illusions and reality of “color gentrification”

O Ye Zheleznyak

Smagin Department of Monumental and Decorative Painting and Design, Irkutsk National Research Technical University, 83, Lermontov Str., Irkutsk 664074, Russia

E-mail: olgaej1@yandex.ru

Abstract. The article is devoted to study of polychromy as a specific means of gentrification, enhancing comfort and the status of the environment, which is determined by color multifunctionality, its belonging to “physical” world and the irrational connection of color with the universe elements. The relevance of the study is determined by the presence of environments that require gentrification, by large interest in color, by the inclusion of indicators of environmental quality and comfort in ideas about prestige, investment attractiveness. The paper discusses the specifics of the real color effect on human body; features of the color life of environment and man; formulated the main provisions of the work with color environment, including for gentrification and updating of the existing environment, creating comfortable urban and interior spaces. Experimental studies and design in Irkutsk show the importance of polychromy in real environmental ennoblement processes. Polychromy as an illusion or a real form of the environment quality improving and image modernizing are studied at the Institute. In general, “color gentrification” are a special form of increasing the comfort and prestige of environment through a color-change in the environment image and quality, corresponding to its psycho-energy, functional scenarios and figurative characteristics.

1. Introduction

Research into the use of color to create a comfortable space, and studies into polychrome as a specific tool for environmental gentrification are made imperative not only by the multifaceted nature of color and its association with the physical “worldview”, but also by the deep irrational connection between colors and the primary elements of the universe, by how it affects personal and general socio-cultural development.

2. Research Relevance and Objectives

The numerous environments in need of renovation and gentrification; public interest in color therapy; the emergence of virtual spaces and worlds; and the maximized diversity of coloring, from color hunger to extreme colors, are the factors making imperative any research into color as a feature of comfort, an important environmental quality and health improvement and renewal.

The variety of aspects inherent in the concept of “comfort” (quality of life criteria, social and ecological characteristics of a comfortable environment, research into natural and ecological comfort, the unique “city image” and “ceremonial” environments, the need for a modern design, etc.) is a well-researched problem [1-8]. The need to gentrify and improve the quality of public spaces in Russia is covered by a number of national and municipal programs.
One peculiar gentrification method is to use the polychrome [9], which alters the emotions, image, and functionality of the environment to make it more comfortable and investment-attractive. In state-of-the-art environmental health and salutogenic design [10-12], using colors as an important tool of gentrification, renovation, and environmental enhancement is considered a core approach; color solutions in interiors and urban spaces are of paramount importance.

The false beliefs in the human-color interaction, including the interactions mediated by the object-spatial environment, are what gives rise to various illusions, from complete denial of any color-related effects to overestimating the same effects. Creating the most accurate worldview helps find the limits of human-color-environment interaction to use colors as a specific way to gentrify the environment.

Thus, the research objectives are to study how colors actually affect human body; define the color-related features of human and environmental life; formulate the basics of color use with due account for specific color effects, including the use of polychrome and color studies to gentrify and renovate the existing spaces; test the theories against real-world object and spaces; introduce the research results to study guides.

3. Theory
Using color is an actual renovation tool to make a more comfortable and healthier environment requires research into physical, physiological, psychological, emotional, and associative color effects on human body [13], and analysis of how color diversity affects human comfort. This is due to basic human physiology: a third of the gray matter learns the visible colors; a special part of the brain analyzes color-carried information; normal human functioning requires that up to 80% of the total information is received via color perception [14,15]. Color affects psychophysiology through the sympathetic and parasympathetic parts of the nervous systems: triggering the former raises the heartbeat rate, the breath rate, and the blood glucose level, etc. [15]; stimulating the latter has an opposite effect.

Studies into emotion-related effects of color show that red, yellow, and white raise the level of anxiety while blue and green inhibit anxiety and aggression for a more relaxed mood [15]. Emotional perception is a function of time: longer exposure causes unpleasant colors to be less irritative while pleasant ones become dull. Moreover, “temporary color overdose” could revert the emotional perception [16]. The emotion-related color effects also depend on the subjective color perceptions based on individual experience, cultural stereotypes, and their actual interpretations (Figure 1).

![Figure 1. (a), (b), (c). Colour integrity of traditional environment (photo O Zheleznyak \ author).](image)

The specificity of color life, whether in man-made or natural environment, is defined by the broad expansion of color in terms of time, activity, and subject matter, which applies to the surrounding world, the personal and social genesis.

Nature uses color for camouflage, as a warning sign, for navigation, etc. [17], which makes polychrome vital. For flora and fauna, color essentially encodes the natural existence, contact, reproduction, and sundry core functions. Color also has a “ritual” role to play in biological behavior; thus, some birds and beasts have spatial colors for mating; plants may change color while maturing, etc. The basics of color are encoded in the DNA to lay the foundation of biological color behavior, thus making any species into a color-code carrier.
The idea of color and its space, which includes the concepts laid out in sacred texts and traditional rituals, or enshrined in cultural stereotypes, reflects the dualism of color: color is something transcendent, nearly divine, and represents a value; but color also is something human beings encounter on a daily basis, take for granted, and use to adapt to the world—and to adapt the world to themselves. This dualism is mainly due to the originally polarized meaning of certain colors. This identifies a key feature of the color phenomenon, which is color ambivalence [18]. Consider red, which is ambivalent in many cultures. In Ancient Crete, it was interpreted as a healing medium, repellent against demons and evil spirits; Greeks and Romans thought it could protect from diseases while symbolizing fertility; in medieval Japan, red stood for love and marriage. Negative meanings of red are just as diverse: aggressiveness, death, sin, violence, retribution. The ambivalence of meaning is inherent in many other colors, too.

When discussing the color specifics of object-spatial environment, the best point to start with is urban color studies. The city’s essential culture-bound images are integral to the environmental code and uniqueness; they are what creates the diversity of sensation. Given that a city cannot be just “burst” anew even if its spaces are outdated [19], color renovation becomes a relevant space renovation and gentrification tool. Using the existing buildings as a basis for new images enables “color editing” of the city. New colors and their compositions [20] affect human emotional state, gives a sense of comfort or irritation, harmony, authenticity, and uniqueness of the place.

There are many diverse problems related to the interior colors; notable are the facts that interior colors have to be better organized and structured [21]. When creating a color concept, it is important to analyze the functions of the object, which is what determines the basic requirements to physics, psychophysiology, emotional energy, and color scenarios of living the space. The best-elaborated theory and practice applies to the color environment of sacral and ritual (ceremonial) premises, traditional industrial and public interiors. But the emergence of new types of spaces requires continuous monitoring of the color capacities and how they could be used to create a viable environment (Figure 2).

![Figure 2. (a), (b), (c), (d). Colour expansion and scenarity of the interior environment (photo O Zheleznyak \ author).](image)

Colors in motion are an important component of the modern environment. For many major cities, the visual ecology is a challenge, as it wallows in chaos and excessive advertisements, informational banners and stands, mediafacades, decorative illumination, etc, which destroys the visual comfort and balance of color, transforming the environmental integrity and organics. This makes it advisable to use polychrome to harmonize the urban environment.

Fashionable color trends and new directions in color studies reflect the latest scientific developments and current cultural trends. Information is usually sourced from research and development in fashion forecasts and promising colors, carried out by the national color centers, institutes, or specialized companies.

Colored light is now expanding from the urban environment, theatrical and public spaces into home interiors. In Russia, the color-light staging of such spaces, especially in homes, is often experimental; designers create polychromic stageplays that are not always scripted for life and comfort. Keeping modernization efforts balanced requires more elaborate pre-designs and continuous monitoring of the capabilities color and light give for gentrification and environmental enhancement.
4. Results

Theoretical studies form the basis of the fundamental concepts of using color to gentrify the space and enhance environmental comfort; these concepts, in turn, are the basis for designs made for specific areas and facilities. They are also usable in study guides and learning environments.

In this context, color effects on human body, the illusions and reality of color gentrification fall into “direct” color impact (physical, psychophysiological, and psycho-emotional) and “indirect” impact, where color functions as a cultural phenomenon and an association space. Excess or lack of a color, an unbalanced color palette will negatively affect human condition, which is why the entire color spectrum must exist in harmony in the daily human life to produce a normalized environment comfortable for human psychophysiology and emotions. Thus, restoring the color harmony can restore the disrupted human-environment equilibrium [16].

Studies into the colors in natural and man-made environments helps define the specificity of biological color behavior and find how color exists as a worldview and en existential paradigm. The ambivalence of color perception and values is what defines a specific norm of color use. The meaning behind a color may range from a symbol of grace to an indicator of insipidity, from a positive to a negative litmus test. This substantially impacts the characteristics, quality, and properties of spatial vitality, emotional and psychological comfort; it also determines the range of the required diversity of emotional experience, in which neither color overload nor color hunger occurs.

The basics of creating a comfortable environment take into account how colors affect people when used to to gentrify the existing spaces; they are intertwined with urban color studies; the coloring of interiors, clothing, ads, and virtual spaces; the light colors; the fashionable color trends, etc. When describing the colors of the environment and the challenges of creating a color space, the environment itself and the patterns of “living” the color, the role it plays in the structure of environmental priorities, etc. are mandatory for discussion. Color-forming processes represent a continuous effort to create a color culture while mastering the (im)material color space. Urban color culture lies on the intersection of color life and urban lifestyle; as such, it shall be viewed through the lens of professional-layperson, creator-consumer relations [18] (Figure 3).

![Figure 3.](image)

Figure 3. (a), (b), (c). Color as part of the gentrification and modernization of the environment (photo O Zheleznyak \ author).

One important aspect of using polychrome as a tool to enhance environmental comfort consists in appeal to subjects’ individualities and ways of living; such appeal shall consider the unique “color anamnesis”, the diversity of human color behavior and emotional assessment of the environment. Regional and cultural local specifics are not to be ignored either. Color preferences and perceptions, as well as cultural archetypes are fundamental to color solutions that create a full range of sensations.

Experimental studies of urban spaces and interiors, coupled with research into color as an aspect of comfortable environment identify the need for continuous monitoring in a continuously changing reality. These efforts also prove necessary the consideration of spatial chromatic integrity, which covers the biological color behavior; the constant polychrome of the surrounding world (natural or artificial) that affects human body and comfort; colors as an integral part of the the views of actual habitability and gentrification.
Designs made for the city of Irkutsk (Uritskogo ul., Student Town, historical and modern facades, ISTU interiors, urban and local images) on a scientific basis show that polychrome is a practical tool for making a gentrified and comfortable environment.

Research into polychrome as camouflage, a virtual illusion or an opportunity for real gentrification, as a way to enhance the environment and to modernize the image is fundamental to the Chromatics and Color Studies course, as well as to experiments carried out as part of term papers and theses. Continuous monitoring of the the emotional and associative effects color and subjective color views have, the search for ways to color-gentrify the existing object-spatial environments are an important part of professional learning.

5. Conclusions

Research into the color genesis in human living space, environments, and culture reveals how deeply rooted color is in human consciousness, life, and culture. Being multifunctional and effective in exerting continuous physical, physiological, and psycho-emotional influence on human body, color as a comfort criterion not only improves the visuals but also helps renovate, gentrify, and revive the environment. This means color gentrification is a special form of environmental enhancement that alters its image and status to tailor the space to the psycho-energetic, functional, and imaginative requirements.

References

[1] Zheleznyak O Ye and Korelina M V 2018 MATEC Web of Conferences 212 08007
[2] Yanshin P V 2001 Introduction to psychosemantics of color (Moscow: Samara)
[3] Generalov V P and Generalova Ye M 2016 Bulletin SHASU. Urban planning and architecture 2(23) 85–90
[4] Dementieva A V and Domozhilov V Yu 2017 Innovative economy: prospects for development and improvement 5(23) 22–6
[5] Dolgacheva T A 2006 Evaluation of the comfort of living in the city for example Saransk (Kaluga)
[6] Ivanova T N 2016 Scientific and methodical electronic journal Concept 38 62–9
[7] Merinov Yu N 2001 Ecological and Social Comfort of the City Environment of Rostov-on-Don
[8] Chekhovskikh T V 2015 Traditions and innovations in construction and architecture Architecture and design pp 157–160
[9] Lees L, Slater T and Wyly E K 2008 The transformation of a working-class or vacant area of the central city to a middle class residential and/or commercial use (New York: Routledge/Taylor & Francis Group)
[10] Heerwagen J H, Haubach J G, Montgomery J and Weimer W C 1995 Official Journal of the American Association of Occupational Health Nurses 43(9) 458–68
[11] Zakharov V M 2000 Environment Health: Concept (Moscow: Centre for Environmental Policy of Russia)
[12] Shishin M Yu 2004 Health environment. Bulletin of the Centre for Environmental Policy of Russia (Moscow: Centre for Environmental Policy of Russia) 30 17–19
[13] Bazyma B A 2001 Color and psyche (Kharkov)
[14] Baranova N 2015 Primani riches with feng shui talismans (Moscow: Eksmo-Press)
[15] Glebka G 2013 Color therapy (chromotherapy)
[16] Breslav G E 2000 Color psychology and color therapy for all (St. Petersburg: B & K)
[17] Oberscher L 1990 Colour for town pp 218–24
[18] Zheleznyak O Ye 2013 Colour. City. Culture (Irkutsk: IRSTU)
[19] Koolhaas R 1978 Delirious New York (NY: Oxford University Press)
[20] Griber Y A Paramei G V and Mylonas D 2018 Color Research and Application 43(6) 958–75
[21] Kurbatova A S 2007 Territory and Planning 2(9)