Original Article

Understanding achromaticity in urban spaces using interpretative phenomenological analysis in Tehran

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Shahriari, Sh., Shahabian, P. and Lak, A., 2023. Understanding achromaticity in urban spaces using interpretative phenomenological analysis in Tehran. Environmental Sciences. 21(1): 251-272.

Introduction: Color has always been a part of describing experiences and memories of people and landscapes. Achromaticity in urban spaces can affect aspects such as memorability and can consequently lead to diminished mental images, challenging the perceptive quality of inhabitants. On this basis, experiencing the vitality of colors in cities can improve the quality of urban spaces. Despite the importance of color in people's perception of urban spaces, few studies have investigated the understanding of chromaticity in such areas. This gap widens in developing countries, such as Iran with extensive construction in its urban areas.

Material and methods: In this study, interpretative phenomenological analysis (IPA) was used as a qualitative approach to provide an accurate examination of personal life experience of urban color perception in order to discover the nature of the lived experience of human understanding of color without any previously prescribed theoretical premise. For this purpose, in-depth interviews were carried out to obtain individuals' perceptions of color in urban spaces of Tehran, Iran. Eleven experts in urban planning and development and architecture were selected through snowball sampling. The interviews were then analyzed in MAXQDA 2020, which yielded four main themes.

Results and discussion: The interaction between the following four themes—i.e., 1) diminished color palette in modern constructions in Iranian cities, 2) attempt to embed colors in urban spaces, 3) colorful life in urban spaces, and, 4) attachment to colorful environments—underlined the color perception of Tehran's urban spaces

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in two themes. The first theme was chromophilia, which increased place attachment (boosting the quality of the environment), and the second was chromophobia, which reduced place attachment (ignoring the improved quality of space and its preservation). Chromophobia can result in paleness, mattness, and grayness of the general aspect of color in the metropolises of Iran, particularly, in Tehran. The fading of local color can cause a diminution of the variety of colors and visual annoyance, which has led to diminished connection and attachment of the city and urban spaces to Tehran. Another finding emphasized using of color in improving attachment and belonging, influenced by environmental context and the formal and color landscape of cities (as well as climate, nature, function, and economy), to indicate principles such as spatial unity, eligibility, mystification, variety, citizens' presence in a context where participation is based on the needs of different demographic-social groups.

Conclusion: Using color could encourage social life and place attachment to urban spaces and it could improve population health, particularly, mental health. The results of the study can add up to the tacit knowledge of urban planners, designers, and managers to attract citizen participation in improving the quality of urban spaces.

Keywords: Color, Chromophile, Urban space, Interpretative phenomenological analysis, Tehran.

Introduction

Colors affect the brain, transmission of emotions, and perception. A considerable body of research in the field views such effects as merely mental, not psychological. Regardless, what is important is the changes and effects that colors have on such perceptions (Barrett & Barrett., 2010). Color has been identified as the primary component in bringing about properties often associated with a favorable space (thoughtfulness, peace, and environment quality), cognitive effects on one`s mind and perception, enhancing the body`s physiological performance as well as improving behavioral disorders (Wu *et al*., 2017).

The biophilic design suggests using the color pallets based on the main components of nature, for instance: trees and plants (including a wide range of whitish light green to blackish dark green) (Parsaee *et al*., 2021), the sky (sunlight reddish shining pink to gray and almost transparent shadows of a rainy day, bright twilight orange-blue to washed-out yellow, and dawn pinks) (Castro *et al*., 2022), the sea (the sea can be combined with lightning gray waves or be seen as a calm and smooth drive of green-blue; in a cloudy day, parts of the water can be light white with white-blue foam) (Zhong *et al*., 2021), and earth (including khaki-light brown, gray, stone shadows and sand colors, which are characteristic of natural stones and pebbles, from wood shadows to soil, skin pigments to fur and human hair, and brown shades) (Aristizabal *et al*., 2021). These palettes can be used in cities to improve function and efficiency in work, entertainment, living, and resting environments. Before modern architecture, particularly in the age of globalization, color in the urban context was mainly determined by the surrounding nature (given the provision of local building materials). Entering the new era, however, gave

rise to using cement, concrete, steel, stone, and glass in urban environments, drawing near to "modern city" models and distancing from the natural-local climate and context. For example, the dominant texture of local structures in the central cities of Iran was adobe and mud with khaki and cream colors. However, in modern architecture and urban design, they were replaced with yellow and red bricks and later with steel, concrete structures with stone and glass facades, a range of buildings that brought a range of colors (Parto et al., 2021).

Although Tehran has experienced a colored life, given its geographical position located close to the snowy white mountains, the green plain, and the colorful Qajar architecture, today, natural landscapes have been removed from the urban view in the form of covering floodways and rivers and transforming them into streets and expressways (Bozorgi et al., 2005). Besides, the dominance of the volume, architectural form, and color of urban structures (mainly concrete, cement, and asphalt that are all gray and dark) over the trees at the sides of streets (Shamsipour, 2017). In addition, the air pollution obscuring the urban views of mountains and neighboring highlands has faded colors, getting Tehran a grayish look, and eliminating and blocking the natural spectrum of colors. Climate change and the warming of the city have also made it almost impossible to see the seasonal change in Tehran. In-depth interviews with eleven urban planning and design experts have revealed that construction in Tehran has been directed towards chromophobia from chromophilia in recent years. Accordingly, since understanding achromaticity and chromaticity in urban spaces

of Tehran can affect the inhabitants' mental health and perception, recognizing the experience and context of these processes can help implement effective measures in urban design policy-making based on individuals' lived experiences. In this regard, this study attempted to investigate achromaticity in urban spaces of Tehran through the perspective of experts in design using interpretative phenomenological analysis (IPA). This study consists of five parts: the first part examined supporting theoretical studies, the second part was a field study, the third part included the methodology, the fourth part was the presentation of results, and the fifth part was the discussion and conclusion.

Theoretical foundations
Psychological effects of colors

Color psychology is a vital field mainly concerned with the study of the effects of colors on human psychology and behavior. According to color psychology, colors cause physiological responses in human emotional, cognitive, and behavioral systems (Elliot & Maier, 2014). Colors create many contrasts at different hours of the day; they form new shades every hour, adding to the space's liveliness and variety. With this in mind, creating type and spatial happiness is easy (Dabbaagh, 2019).

The strong relationship between colors and emotions manifests in different cultures' everyday language (Lei et al., 2021). Nevertheless, the interpretation of colors is not the same in other languages and cultures (Chi et al., 2021) since the meanings associated with colors are influenced by various factors such as

nature and culture. Colors can have several and sometimes rival implications. Therefore, colors can have different meanings according to the time, context, and people or groups that use them (Nielsen *et al*., 2021).

In addition, colors can show regions' history, culture, and particular identities (Qin *et al*., 2020). Accordingly, urban color planning is essential for local authorities who have established rules in this respect. For example, urban color planning in China should be in harmony with the city's historical heritage and dominant color, a color that should be used for developing new areas. Nanjing, one of the important cities in east China, organized urban color instructions, and in 2004, light green was introduced as the dominant color of the city (Jasiński, 2021). In most of these plans and regulations for urban color, controlling the color of buildings is considered the most vital executive plan as they take more area of the urban landscape and have a more crucial role in creating the color landscape with the development of constructions. Urban color planning involves three levels: metropolitan, districtual, and urban blocks (local). The scales mentioned above are of significant importance in urban environment color planning. The principles implemented at each level are different (Qin *et al*., 2020). There can be much variety at the local level, while at the metropolitan level, there is less, and harmony requires much more attention. At the city level, a dominant color can cause a distinguished identity to a city as cultural traces (Behbudi *et al*., 2012).

The use of color is closely related to the typology of urban form. Color can be used as a tool for urban recreation and to engage citizens in the process of place-making in historical and organic contexts that are undergoing urban decay. The use of color in building revitalization can result in the revival of urban spaces (Boeri, 2017). Furthermore, the use of color in organic fabrics improves way-finding, enhances environmental beauty, and conceals visual disturbances. Besides, the use of color in checkered, conventional, and grid fabrics can aid in the creation of spatial identity, spatial distinction, and the annexation of meaning to the location. Additionally, the use of color in contemporary fabrics can increase the legibility, complexity, and mysteriousness of the space (Forsyth *et al.*, 2010), as well as promote attachment to the space and environmental quality.

Using colors in urban spaces has many advantages, for example, attachment and place identity (Scannell and Gifford, 2010). Scannell and Gifford (2010) have proposed a three-dimensional model of place attachment, including person, process, and place dimensions as the main dimensions known as PPP. In this model, the place attachment process includes the affective, cognitive, and behavioral components. Accordingly, colors could play substantial roles in cognitive systems through memory recall.

Moreover, colors can improve environmental quality and answer residents' environmental preferences. The color palette pattern of urban spaces is determined based on climate and socio-cultural characteristics as well as the dominant function and audience of the space (age, gender, and culture). Involving the perception and

preferences of citizens can lead to synergy in the expected result in most cases (Zabetian, 2020).

Finally, employing colors in settlements could Improve the quality of the mental schema of the environment. Lynch (1960) defined the elements of the citizens' mental images of the city, including districts (medium-to-large sections of the city, spatial unity), paths (streets, walkways, and canals inside the city, and people move through them customarily, occasionally, or potentially), nodes (junctions, places of a break in transportation, a crossing or convergence of paths, moments of shift from one structure to another), edges (linear elements as linear breaks in the continuity of different parts of the environment), and landmarks (can be physical objects such as buildings, towers, mountains, sculptures, springs). Colors can contribute to all of the city image elements. In particular, the function of colors is more notable concerning landmarks and edges to recall the place. Nevertheless, it is necessary to note that positive or negative mental responses can accompany recall. In this regard, Solli and Lenz (2011) designed a color model to provide a reference for color geography, playing a determining role in urban color and psychological cognition research. The above model is based on warmth and coldness, lightness and heaviness, and activity. In particular, heavier, more active, and warmer colors create more intense mental responses and more

substantial images (Wan *et al.*, 2020).

Material and methods
Tehran as the context

Tehran: the history of using color in urban spaces Lou (2017) believed that the formation of urban color landscapes, historically in a gradual process, is based on the climate and local biome and consolidated in harmony with the local culture and knowledge. This phenomenon is evident in the last century and during Iran's three governing systems.

Tehran is considered a 200-year-old capital city of Iran, and most of its contemporary urban spaces were created during the modern period. In the last one hundred years, with the changing of the ruling governments and advancement of technology, the urban color of Tehran has been directed towards non-local and new materials from the dominance of natural color. In fact, given that the primary form of Tehran includes fanning alluvial young conglomerate deposits, the petrology of the formation is composed of homogeneous conglomerates consisting of sand and gravel-sized detritus. The dominant color of the soil is light yellow (Ghanbari, 2009). The local earth used in the adobe and mud during the Qajar era in Tehran (Ramezan Jamaat and Akbari, 2013) was changed to gray and dark colors of concrete, cement, stone, and glass (Jam *et al.*, 2020).

جدول ۱- رنگ نما در گذر زمان، تهران، ایران
Table 1. The color of the facade over time, Tehran, Iran

دوره Period	سال Year	مصالح اصلی نما Dominant materials used in the facade	رنگ نما Facade color	منبع Source
قاجار Qajar	1796–1925	خشت و گل Adobe and mud	زرد و کرم Yellow and cream	Ramezan Jamaat & Akbari, 2013

ادامه جدول ۱- رنگ نما در گذر زمان، تهران، ایران
Table 1. Cont. The color of the facade over time, Tehran, Iran

دوره Period	سال Year	مصالح اصلی نما Dominant materials used in the facade	رنگ نما Facade color	منبع Source	دوره Period
پهلوی **Pahlavi**	پهلوی اول The first Pahlavi	1925–1941	آجر، سنگ (استفاده محدود) Brick, stone (limited use)	زرد و کرم Yellow and cream	Salavati, 2012
	پهلوی دوم The second Pahlavi	1942–1979.	آجر، سیمان،بتن،سنگ و شیشه Brick, cement, concrete, stone, and glass	زرد و خاکستری Yellow and gray	
جمهوری اسلامی The Islamic Republic		1979–present	آجر، سیمان،بتن،سنگ و شیشه Brick, cement, concrete, stone, and glass	خاکستری و سیاه Gray and black	Jam *et al.*, 2020

Methods: Interpretative phenomenological analysis

Interpretative phenomenological analysis (IPA) was used in this qualitative study to present a report of the lived experience of people. IPA assumes this is an interpretative attempt since humans are sense-making creatures (Osafo, 2021). Therefore, in IPA, the researcher tries to represent what has happened to the participants. Ultimately, IPA explores individuals' experiences before moving towards proposing a general claim. Currently, there is an extensive set of studies using IPA in psychology as well as art and interdisciplinary fields. This approach helps explore complex psychological-physical interactions that are difficult to explain. The small sample size of most IPA studies allows for reading participants' comments at the micro-level. This inquiry is intensified with inductive and interpretative analysis in IPA (Abouad *et al.*, 2021). MAXQDA 2020 was also used to analyze the results of transcribed interviews in addition to interpretive phenomenology analysis.

Participants

In interpretive phenomenology, samples are chosen on purpose and usually based on the opinions of decision-makers or via the snowball method. In this study, the snowball method was chosen first. Snowball sampling is often used in qualitative research (Osafo, 2021). The small sample size is common in IPA since the analysis of large sets of data could result in losing focus on "potentially subtle inflections of meaning" and consensus on using smaller sample size is increasing (MacLeo, 2019).

The questionnaires were distributed among 27 experts in urbanism, architecture, and restoration. Eleven questionnaires were considered for further analysis based on the convergence and quality of analyzable responses. Furthermore, this was a small sample size, which is common in studies of interpretive phenomenological analysis. The number of participants in phenomenological research can range from 2 to 25 (Creswell, 2013). The sample of participants in this study was homogeneous, so the selection of participants should reflect and express this. The nature of an IPA research study involves homogeneous participants, better criteria, and a "better understanding" of the participants' "lived experiences" as a whole (Creswell, 2013). The purpose was to find a logically homogeneous sample so that the convergence and divergence can be examined in

depth (Smith *et al.*, 2009).

The demographic information of the interviewed experts is shown in Table 2. Concerning sex, five participants were male, and six were female. In terms of age, two of the participants were in the 30–35 age group, six were in 35–45, and three were in the over 45 age group. Regarding education, two experts had a master's degree (architecture and urban design), and nine had Ph.D. degrees. Four participants had five to 10 years of work experience, and seven had more than ten years of work experience.

جدول ۲- ویژگی‌های دموگرافیک خبرگان جهت تحلیل مفاهیم و شناسایی معیارها
Table 2. Experts' demographic characteristics

ویژگی‌های دموگرافیک Demographic characteristics	شاخص‌ها Qualities	فراوانی Frequency	درصد Percentage
جنسیت Sex	مرد Male	5	45.5
	زن Female	6	54.5
سن Age	30–35	2	18.2
	35–45	6	54.5
	بالای۴۵ Over 45	3	27.3
تحصیلات Education	کارشناس ارشد Master's degree	2	18.2
	دکتری Ph.D. degree	9	81.8
رشته تحصیلی Academic discipline	معماری و طراحی شهری Architecture and urban design	8	72.7
	مرمت ابنیه Building restoration	1	9.1
	شهرسازی Urban planning	2	18.2
سابقه کاری Work experience	۵ تا ۱۰ سال 5–10 years	4	36.4
	بیش از ده سال More than ten years	7	63.6
شغل Occupation	مدرس دانشگاه Lecturer	7	63.6
	طراح شهری Urban designer	2	18.2
	مدیر اجرایی شهرداری Municipality executive manager	2	18.2
جمع کل Total		11	100%

Data collection

The interviews were conducted and recorded in the summer of 2021 and winter of 2022 with participants' verbal consent and then transcribed by the researchers. An information sheet was sent to the participants with allotted time to discuss the concepts related to the study before the interviews. Pseudonyms were used for all participants.

First, two pilot interviews were conducted to confirm the validity of the questions and results. The participants were asked to recall a part of a superior experience of color in an urban space. They were asked what aspects of this experience they had noticed, more or less. They were also asked to point out their reasons, motives, and

recent refusal to use color in the urban spaces of Tehran. The interviews were usually 45 minutes long.

We continued to select participants up to data saturation (repeated answers) by 11 participants. Data analysis was carried out with qualitative content. Research notes were initially written down by researchers personally to identify vast thematic features and separate meaning segments for coding targets. The importance of key concepts and themes was considered by reading the interview transcripts several times and taking note of phrases and concepts.

Words, phrases, sentences, or even paragraphs were read all over again in the transcript text while analyzing the transcripts. Researchers discussed their understanding of the discrete meaning sections to refine the concepts into broad logical classifications with more specific subcategories and conceptual frameworks of the research (Lak & Hakimian, 2019).

The following stages were used in the study:

1. Reading and re-reading by researchers.
2. Primary note-taking (including explanatory and conceptual notes).
3. Completing themes (with a focus on specific parts of the interview texts).
4. Exploring the link between extracted themes.
5. Exploring the pattern among items.

Finally, the researchers also explored the hidden meanings (the interpretation of meanings in the context of the research).

The Smith analytical approach was used in this study. When compared to other analytical approaches, his interpretive phenomenological analysis is more structured and places a greater emphasis on the microanalysis of each person's experience (Beck, 2020).

Results and discussion

Identified themes and codes

In the coding process, four themes, 30 initial codes, and 13 secondary codes were extracted from the interviews. The identified themes and codes are explained in the following:

Deterioration of color palette in contemporary urban constructions in Iran

For the deterioration/strengthening of the color palette in Iran's cities, visual annoyance, as a common phenomenon in contemporary constructions in Iran, was considered the cause of the diminishing power of color. This phenomenon results from out-of-home advertising and façade design used in private, governmental, and public buildings. Under these conditions, visual and color annoyance reduces the power of color palette and sense of place attachment as the annoyance prevents creating a distinct, beautiful, and attractive space. In addition, developers' lack of knowledge/access to colored materials highlights that the developers also use a limited range of colors, following society's common mores and customs. A factor in an unwillingness to use colored materials is developers' lack of knowledge about the possibility of reducing costs and improving the attractiveness and richness of the city's color composition by using the natural color of materials.

"For example, knowing that using colored cement is actually very beneficial for them rather than using white or black stones, which are both unsafe and more expensive."

In a customary-psychological process, owners or developers are unwilling to use various colors in

their constructions. Moreover, there are regulations for color that do not encourage designers and developers to use colored materials. Developers seek maximum benefit without considering the latest technologies and users' needs. They tend to follow the typical taste and use a neutral and minimal range of colors, aiming to sell their buildings.

The finding that owners do not consider color necessary was identified as a secondary code for "lack of support from owners about color variety".

According to one of the participants: *"Conservatively, people are afraid of using colors lest it may not be according to the public taste"*. Another secondary code was "lack of assurance about return on investment". Developers and designers welcome conservative colorless design rather than daring to use color for public acceptance and the fear of losing customers. Overall, visual annoyance and using neutral and limited colors in contemporary constructions have weakened the color palette in cities in Iran.

جدول ۳- زوال رنگ در شهرهای ایران
Table 3. Deterioration of color in Iran's cities

مضمون Theme	کد Code	کد ثانوی Secondary code
	محدودیت در استفاده از رنگ Limitations in using colors	
	ناهمخوانی کاربرد رنگ متناسب با گروه های سنی Lack of harmony in using colors fitting age groups	
	اغتشاش بصری کاهش قدرت پالت رنگی Visual annoyance reduces the power of the color palette	
	عدم آگاهی-دسترسی سازندگان به مصالح رنگی Developers' lack of knowledge/access to colored materials	
	عدم همراهی مالکان با تنوع رنگی(ترس از عدم پذیرش مشتری) Lack of support from owners about color variety (fear of customers' non-acceptance)	عدم اطمینان از برگشت سرمایه Lack of assurance about return on investment
زوال رنگ درساخت و سازهای معاصر شهرهای ایران Deterioration of color in contemporary constructions in Iran	مداخله‌گرهای محیطی Environmental interventions	
	کمرنگ شدن هویت های محلی، عامل کاهش تنوع رنگی Fading of local identities, cause of the reduced color variety	
	رویکرد دستوری ناکارآمد Dysfunctional managerial approach	عملکرد از بالا به پایین شهرداری The top-down executive approach of municipalities
	شهرهای بی رنگ Colorless cities and zero or one people	خاکستری شدن تهران Grayness of Tehran Fear of people's rejection ترس از عدم استقبال مردم
	چالش بی رنگی در توسعه های جدید شهری Challenge of achromaticity in new urban developments	
	کاهش سلیقه زیباشناختی نهاد عمومی/ دولتی/خصوصی Diminished aesthetic taste in public, governmental, and private institutions	

In this theme, the deterioration of color in the Iranian cities is considered necessary in the capital city and then passed on to other cities in a hierarchical order.

Negligence of color in this important city was targeted to reform this metropolis. Therefore, color is confirmed by the lack of recognition of variety and particular and distinct identities and

confirmation of a minimal color spectrum. Accordingly, Tehran is considered the copyable version (not only copyable but also the necessary pattern) for other metropolises in Iran. There are historic neighborhoods and highland countryside in Tehran, which have been already packed with variety. Moreover, the internal migration of citizens from other parts, climates, and cultures of Iran to Tehran has added to this variety. However, commanding dictation in the urban management of Tehran has obstructed this variety. Before the Islamic Revolution, this dictation was in modernist form, and based on this approach, the organization of the city suppressed variety and color (in such a condition, the dominant view of the city center on high buildings and glass and concrete façades has colored the city gray). During the post-revolution years, this approach was combined with concepts such as simplicity, avoiding attracting attention, and neutral and uniform colors, and formed the color appearance of Tehran (in fact, at the level of the city's growth, the approach during the Pahlavi period has been continued in the Islamic Republic with more matt and darker colors as well as more limited variety). Such a perception has led to extensive limitations in the type of colors used in the urban landscape. Furthermore, in this approach, the selection of color based on the needs of different groups has been neglected.

In this regard, one of the participants asserted that "Perhaps the scale of urban principles could be considered the only hope of color and belonging for Tehran. At the neighborhood level, extensive constructions, population moves, and fundamental changes have led to the unreliability of color and color palettes in most cases at the micro-level. At the macro level, given the current expansion of Tehran, finding similarities between different parts, neighborhoods, and districts of Tehran is difficult and even impossible. This means that at the intermediate level, the dominance of natural landscapes in the northern parts of Tehran could be the hope of Tehran to revive the color landscape and palette of the city."

Another participant states, "Color can challenge people's moods differently in the city. Stable colors such as whitish-gray or black and white carry only two meanings and make one see living in the city in the form of black or white, happy or unhappy, healthy or ill, and these two colors never define an intermediate relationship for human life."

Additionally, the dictated approach of institutions such as the municipality regarding micro-level actions has not been connected with the neighborhoods' and districts' color palettes. The local municipality house has tried to paint and create sporadic designs on urban walls and frontages of high-rise buildings.

Attempts for the presence of color in the city

The factors in creating color palettes in cities are directly related to urban nature and natural context, including land cover and vicissitudes (as well as water covers) along with the type and amount of rainfall (with particular phenomena like fog). Thus, different climates create different color palettes. There are numerous examples of nature. In Yazd and Isfahan, with a combination of desert colors, the most common and accessible materials have been adobe and

cob (historically). Moreover, turquoise blue in specific structures, such as mosques on the dome and minaret, has been highlighted. One of the participants commented on this as follows:

"Watching the turquoise blue color of the dome and minarets of mosques at height brings to mind the reflection of a spring, river, or lake at the heart of a dry desert or plateau."

جدول ۴- عوامل ایجاد رنگ-پالت در شهر
Table 4. Factors of creating color/palette in cities

مضمون Theme	کد Code	کد ثانویه Secondary code
تلاش برای استفاده رنگ-پالت رنگی در شهر Attempts for using color/color palette in the city	استفاده از رنگ برای عناصر مهم و قابل احترام در بستر شهر ایرانی Using color for essential and respectable elements in the context of the Iranian city	
	نقش زمینه و فرهنگ در شکل گیری معماری و پالت رنگ Role of context and culture in the formation of architecture and color palette	
	پشتوانه تاریخی-فرهنگی در تعیین پالت رنگی Historical-cultural background in determining the color palette	پالت رنگی شهرهای یونان مبتنی بر طبیعت پالت تاریخی یزد پالت تاریخی رنگ اصفهان تنوع پالت رنگی در شهرهای شمالی The color palette of Greece's cities is based on nature The historical palette of Yazd The historical palette of Isfahan Variety of the color palette in the northern cities of Iran

Colored life in urban spaces

Color has various functions in the city, leading to the city's liveliness. In the most crucial code identified for this theme, color was found to be an identity-creating factor. According to the views of experts, color can lead to place attachment through place identity. In other words, color can give identity like what is reflected in cities like Yazd and Isfahan in the color landscape and palette of these cities. In addition to nature, history and culture, which form the cultural landscape of cities, influence the color landscape. These factors together are included in place identity. However, this identity is not formed only by color and the color palette; factors such as type, amount of activity, traffic, residential compactness, construction quality, and technology influence place identity and, consequently, place attachment.

According to one of the participants, "It is essential that the color landscape of the city be in harmony with the functional necessities, manifested in the form of functional identity. The color landscape in a city with a business identity is different from a city with a cultural or political identity. The color landscaper of large and small cities should also be differentiated."

In the words of another participant, "Using a color palette in the city can also be a practical action. In some coastal cities, colors can be used in a way that can be noticeable in the fog and haze. Color can be a security-assuring factor as some colors can create a feeling of security and peace in individuals based on their psychological effects."

Other interviewers pointed out memorable roles of color in urban space, such as security, familiarity, function, and identity (in combination

with other personal-spatial characteristics), which can create a specific identity and meaning for a place. The defined identity and meaning could lead to place

attachment if they are positive, which is seen in people prioritizing certain places for activity, living, and leisure over others.

جدول ۵- کارکردهای رنگ در سطح شهر
Table 5. Functions of colors in the city

مضمون Theme	کد Code	کد ثانویه Secondary code
کارکردهای رنگ در فضای شهری Functions of colors in urban space	رنگ به مثابه عاملی هویت بخش Colors as an identity-forming factor	مثال بین المللی رنگ و هویت An international example of color and identity
	رنگ به مثابه امری عملکردی Color as a functional factor	
	رنگ عامل ایجاد امنیت Color as a security-assurance factor	
	رنگ عامل آشناپنداری Color as a familiarity factor	ارتباط عوامل انسان ساخت بر تصویر ذهنی رنگ Relationship of human-made factors with the mental image of color

Colored environment attachment

Paying attention to color variety-palette is a democratic necessity in the city. This theme refers to the need to focus on citizens' role and participation in identifying and creating (or reinforcing) the color palette in cities. This color palette is stable according to the natural socio-cultural context of urban neighborhoods and districts. Therefore, color can be utilized in urban spaces as a factor in forming identity and creating attachment/belonging. One of the experts expressed this utilization: "In my opinion, color is a subject that, if you want to know its relationship with attachment, experience has shown that it can't be created by a top-down approach without the involvement of people". One of the participants believed that "Attachment is created along with factors such as citizens' participation (while paying attention to the natural context) in the color palette". This view expresses that without considering the requests and needs of citizens, any interference in the color context of cities and neighborhoods

will fall short in achieving maximum function – if not ineffective.

Demographic characteristics are another essential code highlighted by the experts. The following quote shows this importance: "Other crucial themes include previous experience of people about the place, demographic characteristics of individuals (age, sex, etc.), cognitive, emotional, and behavioral dimensions, the complex relationship of individuals with places, and the status of accessibility of the place can all create place attachment concerning color".

The participants, as in the following, expressed other factors creating place attachment (through color and color palette): "Spatial unity, eligibility, and meaning, mystification, order and variety, presence and participation in creating colored space, the duration of presence in and experiencing color in the space, warmth, and coldness of colors, demographic characteristics, belonging, created by long-time presence".

جدول ۶- عوامل ایجاد کننده دلبستگی با رنگ محیط

Table 6. Factors creating attachment with environment color

مضمون Theme	کد Code	کد ثانوی Secondary code
	متاثر از ویژگی های مکان Influenced by the characteristics of the place	صفات محیطی Environmental attributes
	رنگ با خوانایی و معنا Color with eligibility and meaning	
	رنگ و نیاز فضاهای شهری Color and the needs of urban spaces	
	رنگ و سرزندگی Color and liveliness	
	فیزیک رنگ Color physics	
دلبستگی با محیط های رنگی Attachment with colored environments	هویت مکانی و رنگ Place identity and color	
		نسبی بودن ادراک رنگ Relativity of color perception
	مردم و رنگ People and color	دلبستگی از مکان در ذهنیت مطرح می شود Place attachment is expressed mentally
	رنگ دوستی Color of friendship	
	رنگ در مقیاس میانی شهر The color at the scale of urban principles	
	رنگ و نیازهای رنگی مردم Color and color needs of people	

The proposed model

Ultimately, the selected coding process is drawn to connect the relationships of identified themes according to the data collected from the interviews and the views of the experts.
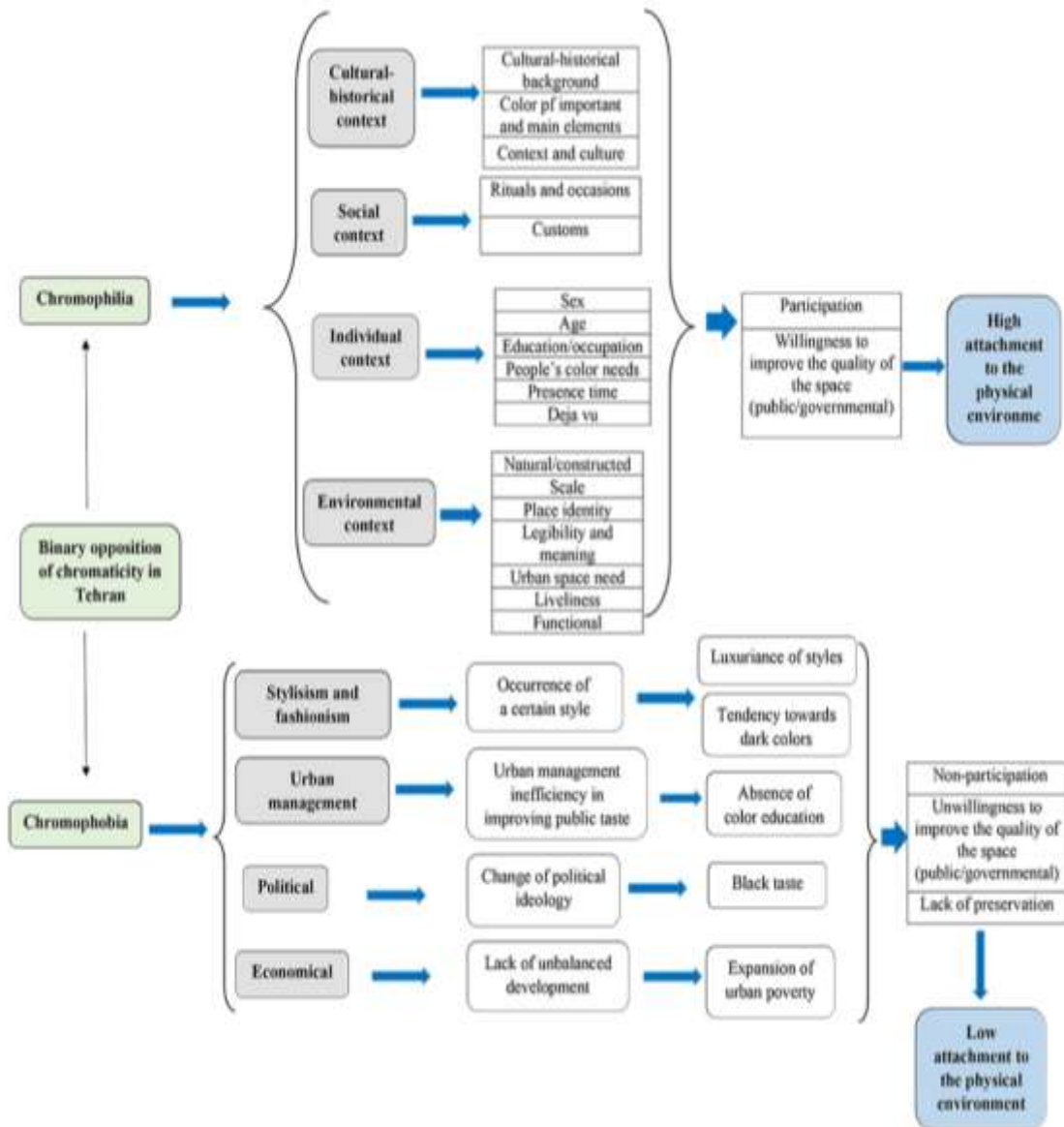
شکل ۱- کدگذاری فرایند تشکیل پالت رنگی
Fig. 1- Selected coding of the color palette formation process

In this study, based on the selected coding model, the four identified themes were related, and the binary opposition of chromophobia and chromophilia in urban spaces of Tehran was examined. Our findings showed that the influential factors on chromophilia are formed in the historical-cultural, social, personal, and environmental contexts and create an attachment to the physical environment by increasing the participation of people and the environment

quality. Accordingly, in the natural-cultural context, the color of the primary essential elements, nature, environment, people, and historical and cultural background, influenced the color palette.

In agreement with our results to explore the importance of using color in urban spaces, Boeri (2017), by introducing the concept of "Color loci placemaking", indicated that colorful placemaking of urban spaces could be

considered to propose urban color to "reconcile the demands of conservation and continuity of the vital and specific identity of each place with the equally inevitable and necessary needs of transformations and reappropriation"(Boeri, 2017). This concept helps more participation in the placemaking process. Xu (2019) also believed that creating place identity through color could be formed by three aspects: branding, identity, and visual culture.

In our study, culture is also considered an element combined with nature and history, reflecting the products of thinking, lifestyle, beliefs, traditions, etc. It is manifested in the form of organizing human-made environments, finally forming the cultural landscape. The comparison of the findings with the findings of a dissertation titled *The Colour in Rehabilitation*, which examined the role of color in urban landscape focusing on the process of perception of local environment and identity, showed that color landscape could express the changes in urban spaces and architecture elements over time (Zybaczynski, 2014). As a result, the role of color in the urban landscape is preserving and transferring the historical and cultural memory in cities, directly relating to the psychological and emotional memory of the public. In a personal context, factors such as sex, age, education, color needs and preferences, duration of presence, and déjà vu are influential. Our findings confirmed the results of a previous study, which investigated how and to what degree involving citizens' preferences is essential in presenting the plan of the color palette in public urban spaces; The study also elaborated on the relationship between

psychological principles of color landscape planning in cities with citizens' perception of urban landscape colors (Zabetian, 2020). By making use of participation-oriented methods such as VEP and preparing a picture questionnaire, variables with a remarkable influence on citizens' perception were examined in a public urban space as a pilot. The results indicated that neutral color palettes in urban spaces could lead to citizens' depression.

The findings of this study demonstrated that contemporary chromophobia in new constructions is influenced by stylism-fashionism and political, economic, and managerial factors. Using color has been manifested in the urban fabric of the cities of Iran historically and has influenced the color palettes of different cities, even historical cities such as the historical fabric of Yazd and Isfahan (having particular influences). In the contemporary era, an approach has gradually disrupted the importance of using color in urban spaces. At the beginning of renovations during the Pahlavi period, authority and assimilation in the field of the urban body with a maximum use, asphalt, concrete, tar, cement, and brick have given a similar color to the cities of Iran. This trend has continued to the current period to some degree, with the difference that the theme of the accepted color has grown darker, colder, and more limited. Following the common trends and styles of architecture has paved the way for acquiring the acceptance of buyers and further economic benefit of the developers. Stylism also lays the groundwork for the spread of consumerism and economic development. As a result, most people turn to new building

materials and fashion-based colors.

Given that the façades of buildings form the urban landscape over time, following the trend and neglecting the natural and cultural context of the city can turn the urban landscape into a composition of inconsistent and expirable elements. The process mentioned above introduces Tehran as a city that cannot tolerate variety, particularly color, obstructing colors with a thick layer of prejudice and smoke, turning everything colorless and gray. This process directs the city toward chromophobia resulting in non-involvement and unwillingness to improve the quality and preservation of the environment, consequently leading to boredom in places. The city's citizens are captured by white, black, and gray and cannot attain these meanings and concepts.

Conclusion

Given that discussions on color studies in the urban landscape are new and there is insufficient experience and analytical methods in Iran, the technique used in this study (IPA) was an indicator of attempting to conduct studies on explaining the relationship of the urban color palette. By applying IPA, this study was conducted to identify the personal perception of the phenomenon of using color on the surfaces of urban spaces in Tehran. The study examined using color in a spectrum between chromophobia and chromophilia.

Our proposed model is considered a starting

point for future studies aiming to evaluate the role of using color in improving the quality of urban spaces. Using color could encourage social life and place attachment to urban spaces and improve city residents' health, particularly mental health. Our prospective studies will focus on testing and applying the framework to expand on the ideas of the color life of public places by developing the present theoretical model.

According to the findings, preparing a "comprehensive management plan for color landscape in metropolises" as designers' facilitator to control and direct color at different levels could be a factor in reinforcing and improving the city's identity and character. If directed towards the right path, using colors can lead to participation (people and public/governmental institutions) to improve the quality of the environment and, consequently, further attachment of the citizens. However, improper use of colors in the city, like following trends and styles, inefficient urban management in improving the public taste, political ideology, and lack of unbalanced development can have adverse effects on the citizens in preserving, participating in, and maintaining the environment and consequently, boredom in the long term. Another important finding of this study which may be considered as future works is that the use of color in promoting attachment is influenced by the color landscape of cities and describes the factors that form attachment to a place differently from attachment models.

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مقاله پژوهشی

درک پدیده بی رنگی در فضاهای شهری کلانشهر تهران با کاربست رویکرد پدیدارشناسی تفسیری

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شهریاری، ش.، پ. شهابیان و آ. لک. ۱۴۰۲. درک پدیده بی رنگی در فضاهای شهری کلانشهر تهران با کاربست رویکرد پدیدارشناسی تفسیری. فصلنامه علوم محیطی. ۲۱(۱): ۲۵۱-۲۷۲.

سابقه و هدف: رنگ همواره یکی از اجزای وصف تجارب، خاطرات مرتبط با افراد و مناظر بوده است. پدیده بی رنگی فضاهای شهری با کاهش ویژگی‌هایی نظیر خاطره‌انگیزی و افول تصویر ذهنی همراه است که در نهایت می تواند کیفیت ادراکی ساکنان را با چالش مواجه نماید. بنابراین، تجربه ماهیت حیات رنگ در شهر میتواند به ارتقا کیفیت فضای شهری منجر شود. با وجود اهمیت رنگ در روانشناسی محیطی، مطالعات اندکی به درک و فهم پدیده رنگ در فضاهای شهری پرداخته‌اند. این امر در کشورهای در حال توسعه با حجم ساخت و ساز زیاد در مناطق شهری، کمتر دیده شده است.

مواد و روش‌ها: در این پژوهش، رویکرد پدیدارشناختی تفسیری(IPA) به عنوان یک رویکرد کیفی، که هدف آن ارائه بررسی‌های دقیق از تجربه زندگی شخصی از درک رنگی شهر به کار گرفته شده است، تا ماهیت تجربه زیسته، بدون پیش‌فرض‌های نظری از قبل تجویز شده، برای درک معنایی انسان از رنگ کشف شود. لذا، ابزار مصاحبه عمیق جهت دریافت ادراکات افراد از رنگ در فضاهای شهری کلانشهر تهران به کار گرفته شد و با یازده نفر از خبرگان حوزه شهرسازی، طراحی شهری و معماری با تکنیک گلوله برفی مصاحبه شد. سپس, ازنرم‌افزار MaxQDA2020 جهت تجزیه و تحلیل نتایج مصاحبه‌های پیاده سازی شده استفاده شده که به استخراج چهار مضمون اصلی منجر شده است.

نتایج و بحث: ۱) تعامل مضامین زوال پالت رنگی در ساخت و سازهای معاصرشهرهای ایران ۲) تلاش برای حضور رنگ در شهر ۳) زندگی رنگی در فضاهای شهری ۴) دلبستگی با محیط‌های رنگ نشان می‌دهد که ماهیت درک رنگی از فضاهای شهری تهران موید دو مضمون رنگ گرایی و رنگ گریزی است که به ترتیب منجر به ارتقا دلبستگی مکان (برای ارتقا کیفیت محیط) و کاهش دلبستگی به مکان (عدم توجه به ارتقا کیفیت محیط و نگهداری آن) می‌شود. رنگ گریزی منجر به رنگ‌پریدگی، مات‌شدگی و خاکستری شدن ویژگی عمده رنگ در کلانشهرهای ایران و به طور خاص تهران می‌شود. کمرنگ شدن هویت‌های رنگی محلی، کاهش تنوع رنگی و اغتشاش بصری را به همراه دارد که نهایتا باعث کاهش ارتباط و دلبستگی شهر و فضاهای شهری به تهران شده است. مطالعه ما دارای نقاط قوت و محدودیت‌هایی

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است. اولین نقطه قوت انجام تحقیقات کیفی بود که مزایای زیادی را ارائه می‌دهد و تکمیل کننده تحلیل کمی موجود در استفاده از رنگ در فضاهای شهری است. ثانیاً، این مطالعه با جمع‌آوری داده‌ها از متخصصان مختلف در بخش طراحی و برنامه‌ریزی شهری، که ممکن است تجربه و اطلاعاتی در مورد رنگ در فضاهای شهری داشته باشند، درک عمیق‌تری از دلایل تشویق و رد رنگ در فضاهای عمومی ارائه می‌کند.

نتیجه‌گیری: استفاده از رنگ می‌تواند زندگی اجتماعی و دلبستگی مکانی به فضاهای شهری را تشویق کند و سلامت جمعیت به ویژه سلامت روان را بهبود بخشد. نتایج این مطالعه می‌تواند به دانش ضمنی طراحان و برنامه‌ریزان شهری و مدیران شهری برای جلب مشارکت شهروندان در ارتقا کیفیت فضا کمک کند.

واژه‌های کلیدی: درک پدیده رنگ، رنگ دوستی و رنگ‌گریزی، فضای شهری، تحلیل پدیدارشناسی تفسیری، تهران..