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The role of gender in visual perception of the body of *Nasir al-Mulk* Mosque in Shiraz with emphasis on individuals' reaction to the color

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Abstract

Researchers have paid attention to perception as one of the most sophisticated methods for space measurement, and gender as one of the most important individual differences. Lack of accurate knowledge of visual perception in architectural space and differences between men and women would lead to the elimination of the psychological aspect of gender and the design of an inefficient space without considering its features. Since this mosque is rich visually in terms of maximum use of color, motifs, and details, this study aims to examine the visual perception of men and women with an emphasis on the reaction of each group to the color in the space of Nasir al-Mulk Mosque. After library studies were done and the research literature was shaped, the data were collected based on the field observations and questionnaire. The results of this study indicate a significant difference between visual perceptions of male and female visitors based on the components of color. Moreover, women have considerably outperformed in terms of visual perception.

Keywords: Visual Perception; Gender; Color; Nasir al-Mulk Mosque

1. Introduction

As one of the most important and sophisticated methods for knowing space, perception is a stream full of ambiguity that depends on various factors. John Locke (1689) expresses that man's mind is created as a Tabula rasa without any motif in it until the contact and connection with external phenomena and objects done through sensation organs would space some pictures and motifs and perception appears. Various senses of humans, including sight, smell, hearing, touch, and taste are perceived in different parts of the cerebral cortex. Among these senses, sight and its receptors are in the retina is the factor creating a person's sensual perception of the external world, and the space knowledge and experience are obtained through the transfer of information and images of visual receptors to neural centers of the brain. Since individuals have different traits and talents and subsequently achieve different space perceptions, individual characteristics are considered as one of the effective factors in this field. Regarding the importance of gender as a social-cultural subject and its deep relationship with different needs and expectations of male and female users of architectural space, it is necessary to revise and think of this topic, so it can reach its accurate position in the process of designing architectural space.

The research method is a survey, and questions were asked in the frame of the questionnaire. To do so, Nasir al-Mulk Mosque which was one of the mosques constructed during the Qajar Era in Shiraz City was selected to be analyzed. This mosque has numerous decorations that are visually rich; hence, this mosque has been always at the center of attention and catches the eyes of any spectator. The attention paid to this mosque beyond other historical mosques over recent years can create curiosity for the distinctive architecture and decorations of this mosque in the visual perception of visitors. The role of color in this mosque is considered one of the most important elements of space. The warm and livable colors used in this mosque directly affect the visual perception of a person providing a richer and unforgettable experience for the visitor. This study tries to examine the visual perception of two groups of male and female visitors regarding different cognitive, sensual, interpretive, and valuing aspects without any bias, and to address the reaction of each respondent group when facing the element of color.

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2. Research Background

In terms of perception and the effect of gender on it, the results of most studies indicate a significant difference between male and female respondents regarding their perception of four stimuli (Barati & Soleimannejad, 2011: Ghamari et al., 2017: Shahcheraghi and Bandarabad, 2017; Lelhaj & Moosavi, 2018: Asadpour et al., 2019; Khoramirouz et all., 2020; Zareian et al., 2021; Balcetis & Dunning, 2006; Vanston & Strother, 2017; Cheraghifar et al., 2021). Ghamari et al. (2017) carried out a study titled "Analytical Approach to Investigate the Gender and Its Differences in Understanding Physical Space" to assess the physical components of space, including visual and aesthetical features of buildings, sensual characteristics, and functional features of space among two groups of

men and women. They concluded that a significant difference exists between groups. Khoramirouz et al. (2019) conducted a study titled "Reading Gender Components in Shopping Centers Design in Tehran" expressing that users especially women are sensitive to space, so they may change it or avoid using it in some cases. These behaviors can be considered as space recreation that is different among various individuals depending on their spatial perceptions and needs. Zareian et al. (2021) carried out a study titled "Explain the relationship between understanding gender stereotypes and understanding spatial quality in female students" to analyze the relationship between young girls' perception of gender stereotypes and compare it with their perception of the educational environment. They found a significant relationship between understanding gender stereotypes among students and the rate of environmental quality perception in school. However, some studies do not consider gender differences as factors affecting visual perception. Shaghiri et al. (2016) studied 1091 participants with the age range of 14-90, measured their performances in various visual perception tests[1], and concluded that gender difference is not effective in a group of young people. Moreover, findings obtained by Crieff (2013) who studied 127 female and 124 male students indicate no significant statistics about the speed and destination estimation in visual perception of participants. Most of the research in the field of gender and perception has focused on educational, therapeutic, cultural, and commercial spaces, while the mosque, as a place of worship, has received relatively little attention by field method.

In addition, many studies have been conducted on Nasir al-Mulk Mosque, including studies conducted by Avaznejad and Sheibani, 2020; Ghoochani and Moosavi, 2021; Toosian Shandiz and Ghafouri, 2022; Shooshtari et al., 2019; Pourmohammad et al., 2022; Kaviani et al., 2023. Avaznejad and Sheibani (2021) studied the color in the architecture of Nasir al-Mulk Mosque and explained that the dominant color palette in the building with warm colors was not that common in religious architecture before the construction of this mosque, and this led to increase the sensory and visual richness of the mosque. Akbarzadeh et al. (2019) also mentioned the intensified stimulation of visual perception with the maximum presence of decorations, color, and motifs in the worship place of the mosque. Although the mentioned papers have examined the elements and decorations belonging to this mosque, studies conducted by these authors indicate that the role of gender in the visual perception of Nasir al-Mulk Mosque has not been investigated.

3. Theoretical Framework

3.1. Concept of perception and visual perception

Perception is a mental or psychological process that is responsible for organizing sensory information and giving it meaning in an active way (Shahcheraghi and Bandarabad, 2017). An accurate understanding or perception requires soundness and integrity of the preceptor system at all levels, so any kind of defect in this system may provide the field for misinterpretation and delusion. Moreover, perception of a phenomenon is selective and everybody perceives some stimuli based on their interests, expectations, and needs among the stimuli received from the environment (Varmaghani, 2018: 51, Pour Afkari, 2022: 45). The perceptive person is not passive and indifferent in the perceptual situation, and perception has an external-internal perception (Shahcheraghi and Bandarabad, 2017: 179). Social factors have a considerable effect on the individual and social fields. Organization of perception in individual factors indeed depends on the needs, motivation, previous experiences, and defensive mechanisms of the person but depends on the culture, society, social groups, and social perception in social factors (Iravani & Khodapanahi, 1992: 194). Moreover, another part of perception depends on the personal characteristics of a person, including age and gender (Taghipoor et al., 2019: 91). Some perceptual discoverers appear in early neural schemas or psychological structures as soon as a person is born (Iravani & Khodapanahi, 1992: 135). Sensual receptors become gradually completed and stronger after birth; therefore, what a child perceives in the environment is different from the perception of an adult (Vernon, 1962: 23). Thurstone explains that differences between people in the perception process are only quantitative and no case remains unperceived (Vernon, 1962: 150). The experience of places is the outcome of the initial visual perception of space (Perovic & Folic, 2012, Keshmiri et al, 2023: 15). These perceptions are defined with fences and light makes it understandable. The fences that define external space are not usually complete but the mind's eye completes the form based on the implicit physical edges (Shabani et al., 2020: 43). Visual perception is the consequence of interaction between observable rays, space with objects and human's eyes (Zak & Zalesak, 2016). In the visual perception process, the eyes convert the information to mental images and send them with the same template to other subsystems. Therefore, when a person stares at an object, the visualization is extracted by initial visual receptors and sent to an area of the brain (frontal cortex) that detects the faces and other objects. After the object is identified, its sensual importance is measured by the amygdala at the end of the temporal lobe of the brain then is transferred to the autonomic nervous system through the Hypothalamus to make a person ready for a vital reaction (Pakzad & Saki, 2014: 12-13).

3.2. Gender and perception of architectural space

As the latent component, gender has received less attention concerning the architectural space. Sociologists differentiate between sex and gender. Sex appears as the difference between physical and somatic characteristics,

[1] Visual and vernier acuity, visual backward masking, and the Wisconsin Card Sorting Test

while gender indicates the beliefs and behaviors that show being a man or woman, and its concept may vary in different cultures and social classes (Holmes, 2008: 36-37). Sex is a somatic and biological truth and gender is a social concept that includes masculinity and femininity during the socialization process of individuals within the social structure (Cuthbert, 2006: 128). When the role of cultures in gender is found, the "creation of gender" in terms of social aspect becomes clear (Khoramrooz et al., 2020: 64). In general, the identification of differences between men and women can play an effective role in the behavior of them. It is necessary to become familiar with differences to achieve adaptability, happiness, health, and peace in the personal and social life. Moreover, one can observe other dimensions of familiarity in the social environment and design of spaces, and consider a kind of balance in this field by paying attention to psych of both sexes (Hosseinzadeh, 2012: 71). Women and men play an important and effective role in shaping a space and changing it. Soja believes that humans a space-oriented creatures and have active participation in the social creation of his/her surrounding space orientations (Fazeli, 2017: 36). Space is the outcome of gender relations and when gender creates some differences in the space where we live or influences our behaviors in the community so it must influence the built spaces (Varmaghani, 2015: 94). The mentioned topics indicate that various factors such as individual, social, economic, cultural, and environmental field factors on the gender attitude difference in space perception.

3.3.Variable affecting the perception in architectural space

Itelson (1978) has identified four various dimensions of perception and believes that these four aspects act simultaneously. These aspects are as follows: 1) cognitive levels: include thinking about environmental stimulus, organizing and storing information. This aspect indeed makes the environment meaningful for us. 2) Affective level: includes our feelings that influence our environmental perception and also the environment perception that influences our feelings. 3) Perceptual level: comprises some meanings and concepts that are obtained from the environment. At the perceptual level, we rely on our mental memories and treasures to compare and interpret new environmental stimuli. 4) Value or valuing level: comprises some values and preferences that make the goods bad. The environment can be considered as a mental structure or environmental imagination created or evaluated through various forms by many individuals (Carmona et al., 2003). Table 1 reports the various components of perception based on four aspects introduced by Itelson based on the relevant theorists and authors.

Table 1
Components of visual perception of architectural space

Analysis base	Components of analysis	Theorist/author
Cognitive level of perception	Form, space, shape, size, confinement, scale and proportion, rhythm, color	Sitte, 1965; Nasar, 1998; Lynch, 1960, Herzog, 1992; Cullen, 1995; Bentley et al., 1985; Arnheim, 2007; Guneroglu and Bekar, 2022; Rezvani, 2016; Modiri & Noorullahi Oskouie, 2015; Taher Tolu Del et al., 2019; Taghipoor et al., 2019; Asadpoor et al., 2019; He, He, & Sun, 2023; Maule, Slkelton & Franklin, 2023; Jaglarz, 2023
Affective level	Pleasure, one's expectation of space, unity, diversity, visually pleasant, complexity, harmony	Zucker, 1959; Cullen, 1995; Herzog, 1992; Kaplan, 1979; Nasar, 1998; Lynch, 1960, Kaplan & Kaplan, 1989; Cassatella and Peano, 2011; Guneroglu and Bekar, 2022; Taher Tolu Del et al., 2019; Taghipoor et al., 2019
Perceptual level	This means reflection, legibility, direction, flexibility	Smith, 2002; Evans et al., 1982; Kaplan, 1979; Nasar, 1998; Lynch, 1960; Kaplan and Kaplan, 1989; Cassatella and Peano, 2011; Guneroglu and Bekar, 2022; Taher Tolu Del et al., 2019; Taghipoor et al., 2019
Value level	Beauty and attraction, memorable, mental image, attendance, social interactions	Smith, 2002; Tibbalds, 2000; Carmona et al., 2010; Guneroglu and Bekar, 2022; Modiri & Noorullahi Oskouie, 2015; Taher Tolu Del et al., 2019; Taghipoor et al., 2019

3.4. Nasir al-Mulk Mosque

Nasir al-Mulk Mosque is located in the God Araban Neighborhood and on the south-facing side of Lotfali Khan Zand in Yazd (1876-1888). The supporter of this mosque was Mirza Hasan Ali Nasir al-Molk the son of Mirza Ali Akbar Ghavam al-Molk who is one of the elders in in Shiraz City. The mosque has a big courtyard with a pond in the middle of the yard. Morvarid Arch is placed in the north-facing front of the courtyard, Shabestan (underground space) with seven stone-made columns is placed in the east-facing front, the main Shabestan with colorful glasses is placed in the west-facing front and two minarets are in south-facing front. This mosque has two porches. The advent of color elements in the mosque's body by using some arts, such as tilework, Muqarnas work, Stone carving, brickwork, and others done by Master Mohammad Hassan Memar, Master Mohammadreza Kashipaz, and Master Mohammad Husseini Naghash Shirazi made this building a landmark of art and architecture during Qajar period

(Ehteshami & Soltaninejad, 2019: 654; Ghoochani & Moosavi, 2022: 62).

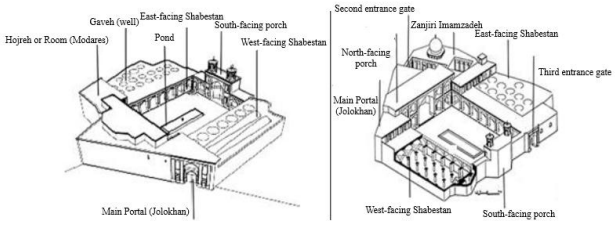
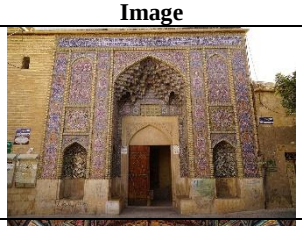
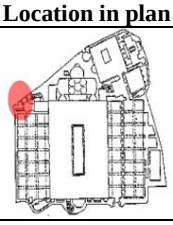
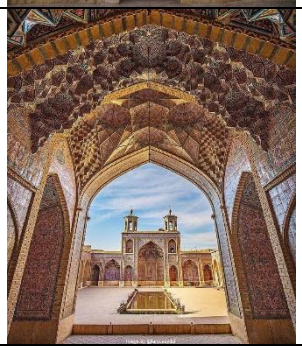
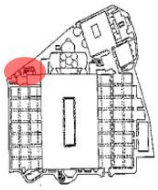
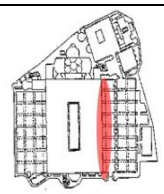
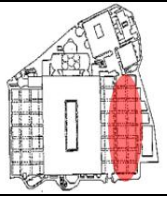


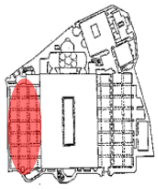
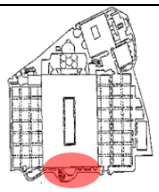
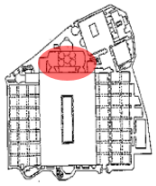
Fig 1. Physical elements and components of Nasir al-Mulk Mosque (Avaznejad & Sheibani, 2021: 27)

3.5. Role of color in visual perception of Nasir al-Mulk Mosque in Shiraz

One of the important cognitive rules for understanding architectural work is color, which is an essential element for communication and response to the surrounding environment (Salingaros & Mehaffy, 2006: 146; Rahmanian & Mahmoodi, 2018: 27). After affecting and stimulating the visual nerves, the color indeed causes seeing and state of excitement in person (Asaadi et al., 2008: 50). When facing the artworks of Qajar period, especially in architectural motifs and decorations, the element of color is more important and its manifestation in Nasir al-Mulk Mosque that is one of the most beautiful monuments of Qajar era is seen in two categories of Orsi (colorful glasses) and architectural surfaces (Portal and Jolokhan, East-facing Shabestan, West-facing Shabestan, North-facing Porch, South-facing porch, etc.) (Avaznejad & Sheibani, 2021: 27). Table 2 reports the color pallet used in each space of the mosque. When facing the visual richness and color diversity available in the space and receiving excessive environmental data in the space of mosque, a person's imagination becomes active to complete their visual perception of the environment by creating mental schemas (Grutter, 2011: 29). The person interprets and experiences the space and reacts to the environment throughout this phenomenon that has a physical-psychological nature (Gem et al., 2019: 100). Table 3 introduces determinant factors of visual perception of color in Nasir al-Mulk Mosque.

Table 2
Colors used in the Nasir al-Mulk Mosque

Row	Name of space	Colored pallet of space	Image	Location in plan
1	Entrance portal	Yellow, bright blue, black, white, azure Plinths of the arch and its surroundings are made of Gandomak Stone in an ochre color		
2	Corridor of entrance gate and vestibule	A- First part: brick-made body in ochre color and ceiling cover of tile in blue, black, and azure color, and brick B- Secondary part: yellow-colored framing in the ochre background (yellow background and blue, whites and pick designs, yellow background, and blue, green, azure, and pick designs and seven-colored tile), the vestibule ceiling decorated with a Shamsa with bright blue and yellow colors and ten-layer designs full of pink-colored tiles		
3	East-facing portico	A combination of blue and black tiles on an ochre background		
4	East-facing Shabestan	Ochre color of brick, tiles with geometric motifs in a combination of black and blue and yellow colors in the white background, floor cover in gray color		

5	West-facing Shabestan and Orsi (Sash Windows)	Orsi: turquoise blue, azure, red, yellow, green, colorless. West-facing Shabestan: arches made of seven-colored tiles, and yellow, white, blue, and pink colors, ceiling of corridors at two sides with a mixture of black and blue tiles, and brick coverage in ochre color, floor cover in the blue and cyan, dominant color of south-facing front: the yellow, dominant color of the west and north-facing fronts: brick coverage in ochre color, colors of middle front: yellow, white and mixed yellow and blues in one in between form, the body of columns: stone in ochre color.		
6	South-facing porch	Bright blue, yellow, black, white, red, azure.		
7	North-facing porch (Morvardi arch)	Yellow, azure, white, black, blue, red, green.		

(Source: observations of authors adopted from Avaznejad & Sheibani, 2021; Ghoochani & Moosavi, 2022; Toosian Shandiz and Ghafouri, 2022)

Table 3
Individuals' reaction to color

Environmental feelings	Enlargement or shrinkage of space	Dai et al, 2022 Jam et al, 2020 Nieves et al, 2011 Edge, 2003, 15
	Increase or decrease the height of the ceiling	
	Widening or narrowing the space	
	Warming or cooling the space	
	Brightening or darkening the space	
	Making the space cleaner or dirtier	
	Making the space younger or older	
individual feelings (state and mood)		Aghili et al, 2022: 105 Jam et al, 2020: 26 Rahmanian & Mahmoudi, 2020: 68
Dependence on the cultural and religious values and meanings		Aghili et al, 2022: 105 Jam et al, 2020: 26
Ability to discover color diversity, geometric form, and details		Jam et al, 2020: 26 Salingaros & Mehaffy, 2006: 169
Spatial orientation		Kalantari et al, 2022
Spatial legibility		Khalili et al, 2020

4. Research Methodology

The present study is a sequential mixed exploratory research in which the qualitative section is conducted first followed by the quantitative section. The research method of this paper includes analytical and field studies (using semi-structured interview, observation & questionnaire), and the research method and tools are documentary and library. In this case, the CVR (Content validity ratio) is used to employ 12 professors, scholars, and active experts in architecture to score components. This technique measures the level of agreement among experts regarding the appropriateness of a particular variable. The minimum CVR ratio for considering an indicator as important is 0.56 (at least 10 successful votes from 12 experts). Table (4) shows the results of content validity ratio test.

Table 4
Validity test results for Content validity ratio

Excluded Variables			Selected Variables		
Variables	Number of favor votes	CVR	Variables	Number of favor votes	CVR
Form	9	0/50	Beauty & Attractiveness	9	0/67
Space	9	0/50	Flexibility	9	1
Shape	8	0/33	Unity	8	1
Size	7	0/17	Meaning reflection	7	0/83
Confinement	8	0/33	Environmental feelings	8	0/83
Scale	7	0/17	Harmony	7	1
Rhythm	6	0/000	Spatial legibility	6	1
Pleasure	6	0/000	Spatial direction	6	0/83
One's expectation of space	7	0/17	Mental image	7	0/67
Diversity	8	0/33	Individual feelings	8	0/67
Proportion	8	0/33	Memorable	8	1
Visually pleasant	7	0/17	Attendance	7	0/83
Complexity	6	0/000	Ability to discover color diversity, geometric form, and details	6	1
			Social interaction	9	0/83
			Dependence on cultural and religious values and meanings	7	0/67

Based on Table (4), 15 indicators with a content validity ratio greater than 0.42 were selected as important indicators, while the remaining indicators were excluded.

To determine the role of gender in the visual perception of Nasir al-Mulk Mosque's body with emphasis on the individuals' reaction to color, a questionnaire was prepared using superior components. The distributed questionnaire assesses the visual perception of the body with nine questions with the following dimensions: harmony, meaning reflection, spatial unity, flexibility, beauty, attractiveness, memorable, mental image, attendance, and social interaction. This questionnaire also addresses the indicator of color based on six components: environmental feelings, individual feelings, dependence on cultural and religious values and meanings, ability to discover color diversity, geometric form and details, spatial direction, and spatial legibility. A group of experts and professors of architecture, urban development, and psychology disciplines have confirmed the face validity of the questionnaire. In terms of internal consistency, also, the validity of visual perception of body and color questionnaires has been confirmed based on the calculated Cronbach's alpha coefficients of 0.77 and 0.71 values, respectively. The questionnaire was distributed among visitors to Nasir al-Mulk Mosque. Regarding the research topic, the considered sample size comprised 384 visitors to Nasir al-Mulk Mosque in the spring of 2024. Sampling for the selection of respondents is done based on the simple random and convenience sampling methods, and the sample size is measured based on the Chochran's formula. Significant results were then obtained by using statistical analysis through SPSS25 Software, Pearson correlation test, T test, Statistical hypothesis testing & Kendall's W Ranks.

5. Results and Discussion

In this study, 384 male and female visitors were studied of which, 52% (n=200) were men and 48% (n=184) were women. Among them, 39.1% of respondents were in the age range of 18-25, 16.9% in the age range of 26-35, 27.2% in the age range of 36-45, 8.1% in the age range of 46-55, and 8.8% were older than 55. In terms of marital status, 279 respondents (72.6%) were married and 105 respondents (27.3%) were single. To test the normality of data, skewness, and kurtosis of research variables' questions were used. According to Table 5 which indicates skewness and kurtosis of data vary between 2 and -2, no reason exists to reject the null hypothesis that indicates data normality.

Table 5
Results of testing data normality

	Indicators	**Kurtosis**	**Std**	**Skewness**	**Std**	**Status**
Visual perception of body	harmony	-0/221	0/157	-0/617	0/313	Normal
	meaning reflection	-0/387	0/157	-0/555	0/313	Normal
	unity	-0/963	0/157	0/017	0/313	Normal
	flexibility	-0/736	0/157	0/268	0/313	Normal
	Beauty, and attractiveness	-0.342	0/157	0.374	0/313	Normal
	memorable	-0.421	0/157	0.378	0/313	Normal
	mental image	-0.243	0/157	0.423	0/313	Normal
	attendance	-0.378	0/157	0.075	0/313	Normal
	social interaction	-0/198	0/157	-0/564	0/389	Normal

Component of color	environmental feelings	-0/16	0/157	-0/564	0/389	Normal
	individual feelings	-0/153	0/157	-0/512	0/389	Normal
	dependence on cultural and religious values and meanings	-0/162	0/157	-0/421	0/389	Normal
	ability to discover color diversity, geometric form, and details	-0/121	0/157	-0/324	0/389	Normal
	spatial direction	-0/143	0/157	-0/487	0/389	Normal
	spatial legibility	-0/108	0/157	-0/432	0/389	Normal

(Source: Statistical findings)

According to Table 6, all variables of the study exist strongly among the considered sample (P-value is less than 0.05, mean value is above 3 and t-value is greater than the critical limit of 1.96).

Table 6
Results of one-sample t-test for research variables

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Beauty & Attractiveness	40.949	383	.000	1.48698	1.4156	1.5584
Flexibility	52.191	383	.000	1.63021	1.5688	1.6916
Unity	49.582	383	.000	1.66406	1.5981	1.7301
Meaning reflection	56.254	383	.000	1.67448	1.6160	1.7330
Environmental feelings	36.746	383	.000	1.41146	1.3359	1.4870
Harmony	21.757	383	.000	.95833	.8717	1.0449
spatial legibility	28.803	383	.000	1.15365	1.0749	1.2324
spatial direction	34.256	383	.000	1.35417	1.2764	1.4319
Mental image	40.852	383	.000	1.52083	1.4476	1.5940
Individual feelings	25.209	383	.000	1.20052	1.1069	1.2942
memorable	23.095	383	.000	1.09635	1.0030	1.1897
attendance	34.276	383	.000	1.38802	1.3084	1.4676
ability to discover color diversity, geometric form, and details	58.846	383	.000	1.73177	1.6739	1.7896
Social interaction	33.035	383	.000	1.29427	1.2172	1.3713
dependence on cultural and religious values and meanings	32.042	383	.000	1.33594	1.2540	1.4179

The significance level of all variables is less than 0.05. Therefore, it can be stated with a confidence level of 0.99 that there is a relationship between independent variables, and since the correlation coefficient sign is positive and its value close to 1, the required correlation exists between variables, and the creation of change in any variable would lead to change in another variable. Table 7 & 8 report the results of the correlation test between research variables.

Table 7
Results of women's correlation test between research variables

		Harmony	Meaning reflection	Unity	Flexibility	Beauty & Attractiveness	Memorable	mental image	attendance	social interaction	environmental feelings	individual feelings	dependence on cultural and religious values and meanings	ability to discover color diversity, geometric form, and details	spatial direction	spatial legibility
Harmony	Pearson	1														
Meaning reflection	Pearson	(.439**)	1													
Unity	Pearson	.390**	.625**	1												
Flexibility	Pearson	.575**	.383**	.443**	1											
Beauty & Attractiveness	Pearson	.600**	.401**	.395**	.621**	1										
memorable	Pearson	.413**	.297**	.210**	.324**	.601**	1									
Mental image	Pearson	.331**	.427**	.394**	.368**	.265**	.372**	1								
attendance	Pearson	.281**	.295**	.406**	.387**	.321**	.356**	.667**	1							
Social interaction	Pearson	.629**	.463**	.385**	.568**	.623**	.389**	.251**	.332**	1						
environmental feelings	Pearson	.651**	.490**	.466**	.527**	.620**	.368**	.459**	.416**	.496**	1					
Individual feelings	Pearson	.674**	.259**	.286**	.603**	.664**	.466**	.385**	.417**	.481**	.686**	1				
dependence on cultural and religious values and meanings	Pearson	.631**	.351**	.304**	.373**	.498**	.483**	.384**	.226**	.464**	.536**	.585**	1			
ability to discover color diversity, geometric form, and details	Pearson	.435**	.400**	.476**	.315**	.278**	.227**	.344**	.438**	.289**	.497**	.402**	.353**	1		
spatial direction	Pearson	.354**	.441**	.517**	.269**	.315**	.353**	.446**	.478**	.223**	.387**	.285**	.351**	.410**	1	
spatial legibility	Pearson	.618**	.379**	.316**	.434**	.616**	.559**	.362**	.381**	.538**	.553**	.652**	.612**	.549**	.500**	1

**: Significance at the 99%.
*: Significance at the 95%.

Table 8
Results of men's correlation test between research variables

		Harmony	Meaning reflection	Unity	Flexibility	Beauty & Attractiveness	Memorable	mental image	attendance	social interaction	environmental feelings	individual feelings	dependence on cultural and religious values and meanings	ability to discover color diversity, geometric form, and details	spatial direction	spatial legibility
Harmony	Pearson	1														
Meaning reflection	Pearson	.412**	1													
Unity	Pearson	.358**	.496**	1												

Flexibility	Pearson	.387**	.320**	.454**	1											
Beauty & Attractiveness	Pearson	.392**	.350**	.486**	.488**	1										
memorable	Pearson	.445**	.350**	.391**	.367**	.508**	1									
Mental image	Pearson	.341**	.274**	.389**	.346**	.344**	.432**	1								
attendance	Pearson	.293**	.297**	.365**	.353**	.4111**	.345**	.397**	1							
Social interaction	Pearson	.391**	.245**	.258**	.322**	.352**	.155**	.273**	.279**	1						
environmental feelings	Pearson	.311**	.252**	.297**	.394**	.437**	.315**	.375**	.223**	.563**	1					
Individual feelings	Pearson	.333**	.321**	.364**	.340**	.404**	.369**	.351**	.402**	.403**	.442**	1				
dependence on cultural and religious values and meanings	Pearson	.375**	.306**	.244**	.416**	.332**	.365**	.421**	.383**	.463**	.489**	.435**	1			
ability to discover color diversity, geometric form, and details	Pearson	.352**	.386**	.524**	.463**	.398**	.283**	.365**	.435**	.252**	.185**	.333**	.303**	1		
spatial direction	Pearson	.406**	.340**	.360**	.326**	.346**	.338**	.285**	.288**	.373**	.322**	.390**	.415**	.339**	1	
spatial legibility	Pearson	.399**	.298**	.297**	.298**	.335**	.178*	.214**	.249**	.329**	.359**	.289**	.281**	.293**	.402**	1

**: Significance at the 99%.
*: Significance at the 95%.

As seen in Table 9, a significant difference exists between visual perception of body and component of color between men and women in in the following variables: environmental feelings, spatial direction, Mental image, Individual feelings, memorable, attendance, ability to discover color diversity, geometric form, and details & dependence on cultural and religious values and meanings. Accordingly, men obtained higher mean values than women in spatial direction. In terms of environmental feelings, mental image, Individual feelings, memorable, attendance, ability to discover color diversity, geometric form, and details & dependence on cultural and religious values and meanings women obtained higher mean scores.

Table 9
Results of difference between gender and visual perception of body and component of color

variables	gender	N	Mean	T value	sig	Result
Beauty & Attractiveness	male	200	4.4400	-1.358	.175	H_0 accepted
	female	184	4.5380			
Flexibility	male	200	4.5750	-1.860	.064	H_0 accepted
	female	184	4.6902			
Unity	male	200	4.6350	-.903	.367	H_0 accepted
	female	184	4.6957			
Meaning reflection	male	200	4.6500	-.857	.392	H_0 accepted
	female	184	4.7011			
environmental feelings	male	200	4.3300	-2.240	.026	H_0 rejected
	female	184	4.5000			
harmony	male	200	3.9250	-.799	.425	H_0 accepted
	female	184	3.9946			
spatial legibility	male	200	4.2200	1.742	.082	H_0 accepted
	female	184	4.0815			
spatial direction	male	200	4.4650	2.980	.003	H_0 rejected
	female	184	4.2337			
Mental image	male	200	4.4450	-2.148	.032	H_0 rejected

	female	184	4.6033			
Individual feelings	male	200	4.0250	-3.914	.000	H_0 rejected
	female	184	4.3913			
memorable	male	200	3.9350	-3.599	.000	H_0 rejected
	female	184	4.2717			
attendance	male	200	4.2750	-2.939	.003	H_0 rejected
	female	184	4.5109			
ability to discover color diversity, geometric form, and details	male	200	4.6550	-2.769	.006	H_0 rejected
	female	184	4.8152			
Social interaction	male	200	4.3300	.951	.342	H_0 accepted
	female	184	4.2554			
dependence on cultural and religious values and meanings	male	200	4.1600	-4.509	.000	H_0 rejected
	female	184	4.5272			

The results of the Kendall's W test on ranking visual physical perception and components of color based on gender (Table 10) indicate a considerable difference between men and women in terms of physical visual perception indicators and components of color based on gender. Therefore, a significant difference exists between average ranks of physical visual perception and components of color based on gender.

Table 10
Results of the Kendal's W test on ranking physical visual perception and components of color based on gender

	male Mean Rank	**female** Mean Rank
Beauty & Attractiveness	8.54	8.58
Flexibility	9.24	9.34
Unity	9.63	9.49
Meaning reflection	9.72	9.52
Environmental feelings	7.95	8.28
Harmony	5.88	4.94
spatial legibility	7.27	5.54
spatial direction	8.86	6.43
Mental image	8.59	8.83
Individual feelings	6.49	7.85
memorable	5.77	7.27
attendance	7.60	8.52
ability to discover color diversity, geometric form, and details	9.67	10.17
Social interaction	7.88	6.60
dependence on cultural and religious values and meanings	6.94	8.62
N	200	184
Kendall's W[a]	.138	.199
Chi-Square	386.910	512.144
df	14	14
Asymp. Sig.	.000	.000

6. Conclusion

As mentioned before, this study aims to examine the men's and women's visual perception of Nasir al-Mulk Mosque in Shiraz. Since the factor of color is one of the most outstanding elements in this mosque and a warm color pallet is used, this mosque is significantly different from other mosques. Therefore, this study addressed the reaction of the two mentioned respondent groups when seeing this mosque. For this purpose, the questionnaire has been used and the obtained data have been assessed by using the Pearson correlation test, T test, Statistical hypothesis testing & Kendall's W Ranks.

The research findings indicate a significant relationship between visual perception, gender, and the reaction of individuals to color. The results obtained from the difference between visual perception and gender of the body indicate that female respondents obtain a higher score in terms of the following components: environmental feelings, spatial unity, meaning reflection, flexibility, beauty and attractiveness, memorable, attendance, individual feelings, and ability

to discover color diversity, geometric form, and details, mental image, attendance, harmony, and dependence on cultural and religious values and meanings. The male respondents obtained higher scores in the following components: legibility and spatial direction and social interaction.

In general, it can be stated that women outperformed in terms of visual perception. The findings of this study about the stronger visual perception of women are in line with the results obtained by Balcetis & Dunning, 2006; Barati & Soleimannejad, 2011: Ghamari et al., 2017: Shahcheraghi and Bandarabad, 2017; Vanston & Strother, 2017; Lelhaj & Moosavi, 2018: Asadpour et al., 2019; Khorrami et all., 2020; Zareian et al., 2021; Cheraghifar et al., 2021.

Based on the interview, in terms of "environmental feelings", women had the highest sensitivity to the environmental temperature (making space warmer or cooler). The findings of this study are matched with results obtained by Xiong et al., 2015; Zhao et al., 2023; Du et al., 2023; and Zhou et al., 2024 in terms of more changes in women's skin temperature, the ability of men to adjust the temperature of their body with the environment, and more sensitivity of women to environmental temperature. In terms of this index, also, men had considered the highest effect related to factors of space dimension. The factors of "widening or narrowing the space," "enlargement or shrinkage of space," and "increase or decrease the height of ceiling" were reported as the most effective factors in environmental feelings of male respondents. The research findings about the better perception of length, width, and height (3D perception) among men are in line with results obtained by Ghamari et al. (2017), Lelhaj and Moosavi (2018), Sohrabzadeh et al. (2022), Yuan et al. (2019), Xin et al. (2019), and Khaleghimoghaddam (2023). Men obtained higher mean scores in terms of the "direction" and "spatial legibility" indicators, and this attribute is rooted in stronger perception in their 3D imagination.

The women who visit the mosque think that this mosque does not provide the expected spiritual space due to the maximum use of architectural motifs (landscapes), colors, and decorations that are rooted in imitation of Western architecture during the Qajar Era. The results of this part in the group of women are matched with results obtained by Akbarzadeh et al. (2018) and Mojtabavi et al. (2023) who pointed to increasing display features of Nasir al-Mulk Mosque due to its numerous decorations and reduced worship potential. On the contrary, men thinks that the space of mosque is spiritual. Comparison between men and women in terms of the "ability to discover color diversity, geometric form, and details" confirms this result. The results of this study about the holistic perception of men and atomic perception of women are consistent with findings obtained by Ghamari et al. (2017), Lelhaj and Moosavi (2018), Sohrabzadeh et al. (2022), Paramei et al. (2018 The), Fider & Komarova (2019), and Khaleghimoghaddam (2023). Men had a considerably weaker performance in detecting and identifying the colors available in each space, color diversity, and paying attention to motifs and details. The results obtained by Lelhaj and Moosavi (2018), and Sohrabzadeh et al. (2022) imply the higher ability of women to feel and perceive beauty.

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