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Araştırma Makalesi

Design Elements Used to Create a Perception of Space in Architecture: A Case Study of Iranian Architecture

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Abstract

Human beings are constantly interacting with their space and perceive their environment through their senses. These perceptions are sometimes interpreted through knowledge and experience, sometimes through instant feelings and memories. The most significant perception component is visual perception, and it is about the sense of sight. The design elements that affect the visual perception of space are form, color, material, texture, light, and reflection.

Space is a reflection of human life with all its dimensions. In modern buildings, space designs are in harmony with people's needs, beliefs, and knowledge. However, in historical buildings, it is sometimes necessary to fully discover the space's architectural qualities and sensory features of the space to sense space perception fully.

For the purposes of the study, five examples of the historical buildings that have historic and architectural quality and importance in Iran were selected from the list of Iran Cultural Heritage Organization. The study discusses the design elements that affect the perception of space in these historic buildings and the design objectives of the vernacular historical architecture in Iran.

Keywords: Elements of architectural perception, Vernacular architecture, Perception of space, Types of spatial perception.

Geleneksel ve Tarihi Mimaride Mekân Algısı Oluşturmak İçin Kullanılan Tasarım Öğeleri: İran Mimarisinden Bir Örnek

Öz

İnsan içinde bulunduğu mekân ile sürekli bir etkileşim halinde olup içinde bulunduğu mekânı duyular yoluyla algılar. Bu algılar bazen bilgi ve tecrübelerden yararlanarak ve bazen anlık hisler ile yorumlanır. Algılamanın büyük bir kısmını, görme duyusu kaynaklı, görsel algı oluşturmaktadır. Biçim, renk, malzeme, doku, ışık ve yansıma kavramları mekândaki görsel algıyı etkileyen tasarım ögeleridir.

Mekân, tüm boyutlarıyla insan yaşamının bir yansımasıdır. Modern yapılarda mekan tasarımları insanların ihtiyaçları, inançları ve bilgileri ile uyumludur. Ancak tarihi yapılarda mekan algısını tam olarak algılayabilmek için bazen mekanın mimari niteliklerini ve mekanın duyusal özelliklerini tam olarak keşfetmek gerekir.

Bu makalede İran'ın Kültürel Miras Koruma Kurumu listesinde, İran'ın en çok tarihi ve mimari değere sahip olan, tarihi binalar arasından beş örnek incelenmek için seçilmektedir. Araştırmada bu tarihi binaların mekân algısına neden olan tasarım

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öğelerini ve geçmişte mimarın bu algıların duyulmasının ardında olan tasarım amaçlarını ve günümüzde mimar olmayan kullanıcılar tarafından bu algılara ulaşılıp ulaşılmaması tartışılmaktadır.

Anahtar Kelimeler: Mimari algı unsurları, Geleneksel mimari, Mekan algısı, Mekan algı çeşitleri.

1. Introduction

When a person looks at the outside world from his window, he distinguishes between inside and outside, darkness and light, and cold and hot. He discovers his preferences and criteria for a comfortable space by doing so. People are in constant interaction with the space they are in and perceive their environment through their senses. These perceptions are interpreted sometimes through knowledge and experience, sometimes through instant feelings and memories. The significant component of perception is visual perception, and it is about the sense of sight. During their interaction with their environment, individuals interpret visual stimulants around them and recognize their location, boundaries, and other related features. Later, based on these interpretations, they perceive the place and the objects with the help of various physical elements. Space, which is one of the elements through which human beings define their existence, is both a restrictive and complementary element for architecture. We need to receive some senses or feelings from a space to perceive it. Perception of space changes depending on the effects of abstract and concrete factors such as color, light, reflection, texture, and scale in a particular space.

The article will first explain space, perception, perception of space as the main concepts, and space perception factors. Later, it will discuss the perception of space by giving references to the vernacular and historical buildings from Iranian architecture, which were selected due to their unique spatial features and historical importance and the design elements affecting perception and the effects of these elements on people.

The study uses the following research methods: descriptive literature review and observation. It also examines the types of abstract design elements applied in these study-specific selected vernacular and historic buildings and their roles in building perception of space.

2. Space and Perception

Space is neither purely abstract nor purely concrete. It is both a concept and a reality in all dimensions and forms. Therefore, it is a life, shifting and flowing unity of relationships and forms.

According to Ashihara, it is possible to create space even without deliberate action. For instance, even an umbrella opened during rain can form a space (Ashihara, 1970, p. 29). Space is more than an abstract field. It is composed of objects and tangible things, and it has materials, shapes, textures, and colors (Norberg-Schulz, 1975). Perception of space means establishing bonds with space through the perception of symbols and activities. This feeling can be created in spaces where people live, and it can accumulate and get increasingly profound in time (Relph, 1976, p. 147). Perception of space is closely related to people's actions in this space (Steele, 1981, pp. 3-11).

In addition to physical elements, space involves messages, meanings, and codes that people decode and comprehend according to their own roles, expectations, motivations,

and other related factors (Rapoport, 1990, p. 61). Perception of space is about people's feelings and personal perspectives based on the available information about a particular space (Hummon, 1992, p. 262). Perception of space is more than an emotional and cognitive experience, and it involves cultural associations (Low & Altman, 1992, p. 2). Louis Kahn emphasizes the space and perception relationship by stating the following words: "Architecture creates a new world that can be perceived emotionally" (Kahn, 1988, p. 96).

Individuals have to understand spatial relationships and later associate them with a particular space to reflect their personal goals and related actions (Norberg-Schulz, 1972, p. 15). An architectural space cannot be defined only through three dimensions. A person creates a fourth dimension for himself while moving inside a building. This spatial experience is unique to architecture (Zevi, 1990, p. 11).

It is unnecessary to have strict borders of solid materials around all sides of a place to call it space. The most important criterion is that these clear or vague borders should somehow be perceivable. People try to conceive a space through its certain features such as borders, forms of surfaces, colors, texture, meaning, etc. (Figure 1, 2).

Figure 1. Golestân Palace, Tehran, Iran

Figure 2. Niavaran Palace, Tehran, Iran

3. Types of Perception Affecting Spatial Stimulation

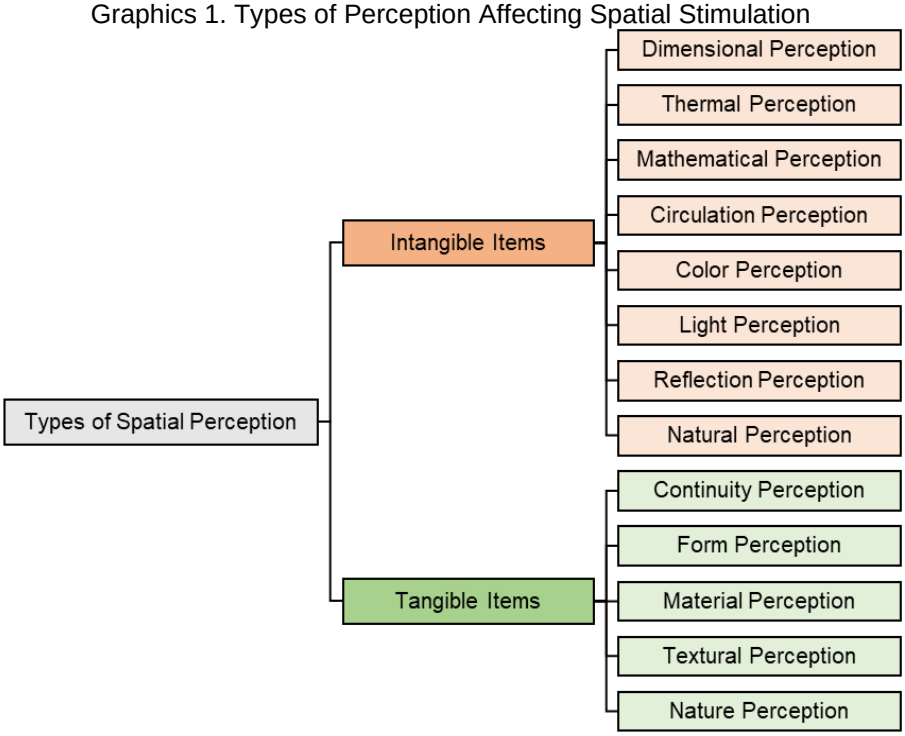
Many researchers have examined types of perception that affect spatial stimulation in spaces with different functions and dimensions. Table 1 displays the types of spatial perception studied by Steele, Relph, Schultz, Salvesev, and Pretty.

Table 1. Types of Spatial Perception Studied by Different Researchers (Maliki, Parsa, Vasig, & Muradi, 2015, p. 103)

Researcher	**The elements of the space in focus**				
Fritz Steele	Dimensional	Human Scale	Texture	Color	Odor
	Imagination	Dimensionality	History	Trust	Space
	Proportions	Visuality	Distance	Acoustic Properties	
	Memories	Identity	Pleasure	Imagination and Illusion	
	Visual	Light	Color	Form	Odor
Norberg Schultz	Material	Form	Texture	Color	
Salvesev	Nature	Circulation			
Pretty	Dimensional	Communication			

This article examines nine types of perception by using the methods developed in the previous studies. Visual perception is the most important and influential type of perception. Graphics 1 displays types of perception affecting spatial stimulation and sub-dimensions of visual perception.

Graphics 1. Types of Perception Affecting Spatial Stimulation



4. Intangible Elements Affecting Visual Perception in Space

As the essential element of spatial perception, visual perception involves many immaterial perception elements. Below is the information regarding the effects of the essential elements of visual perception on the space: dimensional, thermal, mathematical, circulation, color, light, reflection, and nature.

- Perception of Dimension

This perception type is about the sizes of objects, the relationships of sizes with each other, and scale, and it signifies the effect of scale on the perception of space. Scale in space might mean its scale to other spaces, objects, or people. Since people use spaces and objects, it is essential to take their scale to people during the design process (Figure 3).

Figure 3. Tabatabaei-ha House, Kashan, Iran

- Perception of Temperatures

Thermal perception occurs in case of temperature differences. Air, color, texture, and dimension are four significant elements affecting this type of perception. For instance, the yellow-red color of fire is associated with a hot color and the blue-green color of ice with cold color, which creates the perception of hot and cold. As for the texture, surfaces with smooth textures create a perception of cold, while a rough surface creates a perception of hot. Finally, from the size point of view of the space, a narrow-closed space with a low ceiling creates a perception of hot, while open and broad areas with high ceilings are perceived as cool.

- Perception of Mathematical Proportion

Using mathematical calculations, geometrical shapes, and proportions while designing a space changes people's perceptions. This perception occurs by designing concrete forms according to an abstract proportion using abstract mathematics, which creates a unique perception.

- Perception of Circulation and Plan

Perception of circulation occurs because of the effects and inducement of specific designs, beliefs, needs, and cultures. The definition of this perception requires considerable knowledge about a particular space and the beliefs, needs, and culture of the users and their nearby environment. Otherwise, it is difficult to understand why and where a particular space was built and perceive it in temporal terms.

- Perception of Color

According to the explanations of modern science, light consists of electromagnetic waves. In other words, color is the effect of light on the eyes depending on its own structure and its dissemination on objects (Sözen & Tanyeli, 1986, p. 200). Perception of color occurs when physical, physiological, and psychological conditions are met (Figure 4).

Figure 4. Nasir-Ol Molk Mosque, Shiraz, İran

- Perception of Light

Light is physical energy through which living creatures can see objects and colors with their eyes. Perception of light is related to the sense organ and the subjective state of the observer, in addition to the physical stimulant. Light plays a significant role in giving spaces meaning and a way of expression (Figure 5).

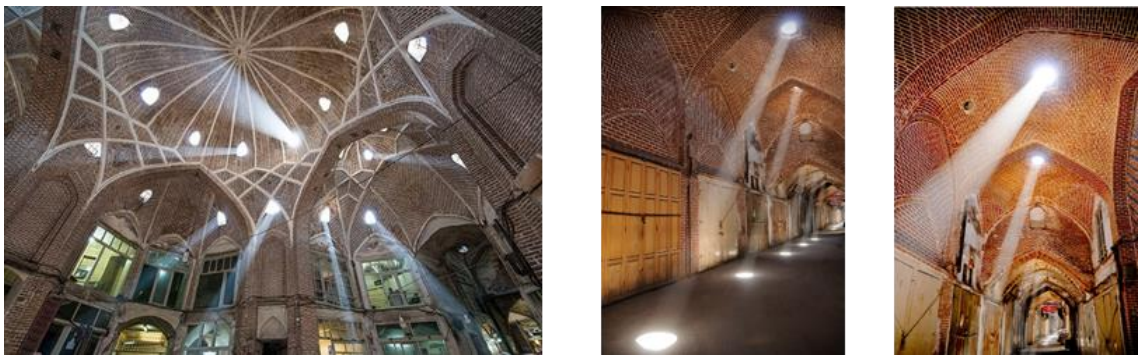


Figure 5. Tabriz Grand Bazaar, Tabriz, Iran

- Perception of Reflection

Reflection in a space creates a kind of dynamism and highlights the essential characteristics of this space. In other words, an architect emphasizes the importance of a characteristic unique to space by reflecting it on the space again through different methods. The most effective reflection methods are applied through the use of water elements and mirrors (Figure 6, 7).

Figure 6. Chehel Sotoun Palace, Isfahan, Iran

Figure 7. Golestân Palace, Tehran, Iran

- Perception of Nature

The effect of nature on the perception of space occurs in two ways: the first being the use of nature itself as an elementary factor in space or creating a perception of nature through which designs represent nature. To create this kind of perception, water, trees, and flowers must be living in their natural space (Figure 8).

Figure 8. Golestân Palace, Tehran, Iran

5. Tangible Elements Affecting Visual Perception in Space

- Perception of Continuity Rhythm

It refers to perceiving the units by relating them to each other and grouping them under certain classes. Continuity is followed by feelings of curiosity, discovery, and movement (Figure 9, 10).

Figure 9. Blue Mosque, Tabriz, Iran

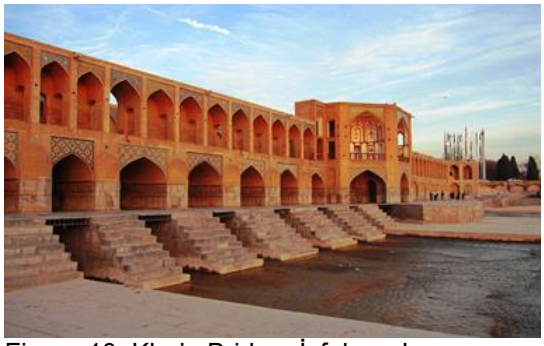


Figure 10. Khaju Bridge, İsfahan, Iran

- Perception of Form

The form is the outside appearance of an object (Tatarkiewicz, 1980, p. 220). The values contributed to space by forms can create specific effects in the space, such as comfort, coziness, sincerity, movement, etc. (Figure 11, 12).

Figure 11. Borujerdi House, Kashan, Iran

Figure 12. Amir Chakhmaq Mosque, Yazd, Iran

- Perception of Materials

The common materials used in designing and constructing spaces are natural and artificial stones, terracotta, natural and artificial wood, metal, plastic, and glass. Each of these materials has different effects on spaces. When several materials are used together, the features of these materials and their compatibility should be considered (Figure 13).

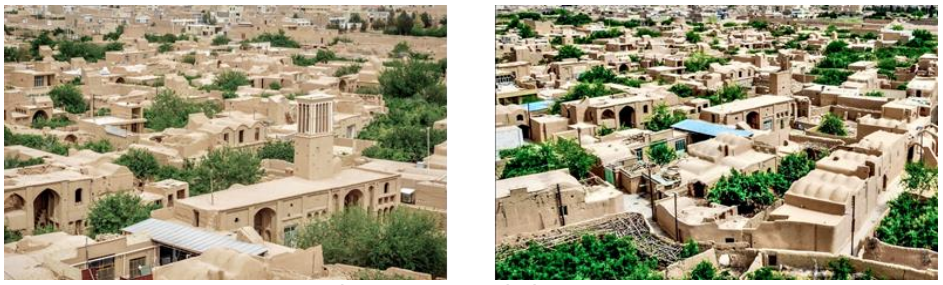


Figure 13. Yazd city, Iran

- Perception of Texture

Textures of surfaces primarily affect the visual effect of the space and how it is perceived, the character of a space. The optical texture of space refers to its visual pattern, and its tactile texture refers to its objects that can be felt physically by touching. The texture is a stimulant interaction element that stimulates the senses of sight and touch (Figure 14).

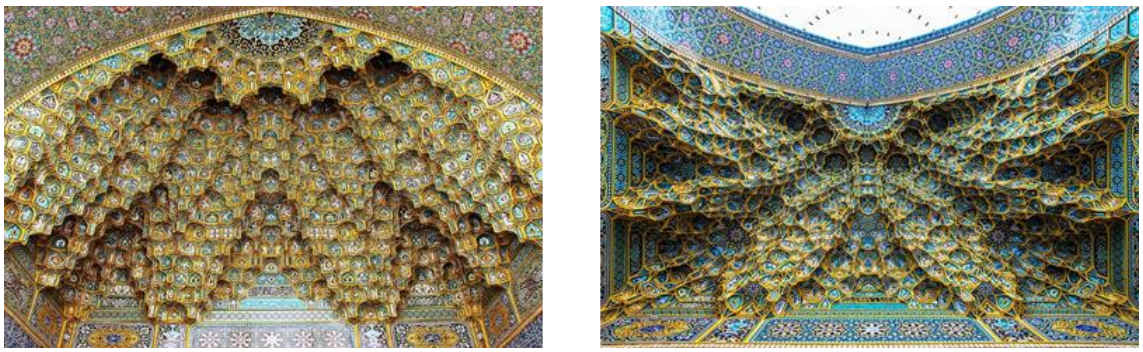


Figure 14. Textures used in the Mosque, Qom, Iran

- Perception of Nature

In an intangible way, the effects of nature appear in the perception of space with designs representing nature in space. Thus, designs describing nature on walls, ceilings, doors, and windows are the most prominent examples of benefiting the intangible perception of nature (Figure 15).

Figure 15. Golestân Palace, Tehran, Iran

Perception of space occurs due to connections between the feelings and dreams of human beings and the features of spaces. In historical buildings, the perception of space is different from that of modern buildings. This perception is based on people's past experiences, memories, culture and beliefs, historical information, or a new experience. The design elements mentioned above, which are light, color, water, reflection, nature, sound, repetition and order, geometrical shapes, and space dimension, are essential in perceiving historical buildings.

6. Perception of Space in Iran's Historical Places

For the study, some of the historical buildings in Iran, which Iran Cultural Heritage Organization protects, were selected according to the following criteria:

- With its popularity worldwide and a high number of visitors,
- Minor damages during big earthquakes,
- Not losing its essence and identity,
- Continued dynamism,

- Inspiring other contemporary buildings with their architectural features,
- Possessing most of the perception factors we examined in this study,
- Belonging to the Safavid Dynasty and Qajar Dynasty periods, which were opulent periods according to their amount of work, richness in detail, and design, the retrospective viewpoint of Iranian architecture was at its peak.

In this section, the effects of perception factors mentioned above on perception of space are explained in the following tables below: Sheikh Lotfollah Mosque (Table 3), Qazvin Grand Bazaar (Table 4), Nasir-Ol Molk Mosque (Table 5), Tabatabaei-ha House (Table 6) and Char Fasl Bath (Table 7).

Table 2 displays general information about the selected vernacular and historical buildings in Iran:

Table 2. General Information About the Study-Specific Historical Buildings (Iran Cultural Heritage Organization, 2021)

Name of the Building	**City**	**Year of Construction**	**Area (m2)**	**[1]T.P.B**	**[2]T.Y.P.S**
Sheikh Lotfollah Mosque	Isfahan	1619	-	Safavid	1932
Qazvin Grand Bazaar	Qazvin	1620	14,000	Safavid	1978
Nasir-Ol Molk Mosque	Shiraz	1888	2,890	Qajar	1979
Tabatabaei-ha House	Kashan	1919	4,370	Qajar	1977
Char Fasl Bath	Arak	1925	1,600	Qajar	1976
[1]The Period it Belongs to		[2]The Year When Preservation Started			

Table 3. Analysis Sense of Place of Sheikh Lotfollah Mosque

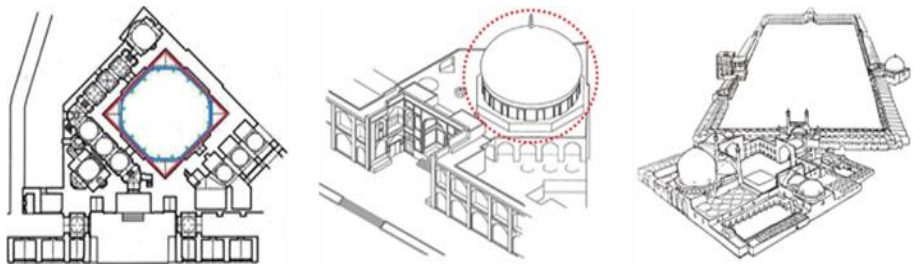
Sheikh Lotfollah Mosque, Isfahan, Iran, 1619	
Spatial Perception Elements	Mathematics and Geometry, Color, Light, Form, Texture, Nature.
The Effects Created by Perception Elements in the Space	***Mathematics and Geometry:*** The plan of the space first starts with four walls around the area and then turns into an octagon and still later into an octadecagon in the dome (the beam holes), which proves that the building was designed by using complex mathematical methods (Figure 16).
	
	Figure 16. The mathematical structure of the mosque (Ebad, 2013, p. 941)
	Color: Blue color creates a feeling of peace, and gold color makes space look more valuable and important (Figure 17).

Table 3. Analysis Sense of Place of Sheikh Lotfollah Mosque (Continues)

The Effects Created by Perception Elements in the Space	 
	Figure 17. The Colors used in the mosque
	Light: The drawing on the inside of the dome looks like a flower when beams of light do not enter the building through the holes in the dome. When these beams are reflected inside the space, this drawing merges with these light beams and creates an image of a peacock. The beams of light entering through these holes create a spiritual ambiance in the space (Figure 18).
	 
	Figure 18. The spiritual atmosphere created by the reflected light
	Form: The form of the mosque is different from that of other mosques. This mosque does not have a minaret (Figure 19).
	 
	Figure 19. The form of the mosque
	Texture: Some textures create a distant perspective on the mosque's facade (Figure 20).
	 
	Figure 20. The textures on the entrance to the mosque

Table 3. Analysis Sense of Place of Sheikh Lotfollah Mosque (Continues)

The Effects Created by Perception Elements in the Space	***Nature:*** The tiles of the mosque have ornaments reflecting nature. In addition, the textures on the facade of the mosque were inspired by the pattern of a honeycomb (Figure 21).
	 
	Figure 21. The design forms in the mosque reflect nature
Architectural Features	They created a peaceful place for prayers (worships) by intermingling nature and architecture. The use of golden color and the specific unique characteristics of the mosque (without a minaret etc.) show that this space was dedicated to the king of the period, and it was not an ordinary mosque. The square form used in the plan was inspired by four symbols of life: water, fire, soil, and wind.
The Effects Created by the Space	Peace, spiritual feelings, feeling that you are out of this world, being closer to Allah, feeling of relief, feeling like you are in heaven, diversity and caring; the design is based on geometrical proportions and mathematical procedures.

Table 4. Analysis Sense of Place of Qazvin Grand Bazaar

Qazvin Grand Bazaar, Qazvin, Iran, 1620	
Spatial Perception Elements	Mathematics and Geometry, Light, Continuity, Material.
The Effects Created by Perception Elements in the Space	***Mathematics and Geometry****:* There are simple and straightforward geometrical forms in the structure of the space. The geometrical shapes on some domes were used as ornaments (Figure 22).
	  
	Figure 22. Geometrical and mathematical shapes in the grand bazaar
	Light: There are holes for light beams to enter the domes built between two vaults (Figure 23).
	 
	Figure 23. The sunbeam holes on the ceilings

Table 4. Analysis Sense of Place of Qazvin Grand Bazaar (Continues)

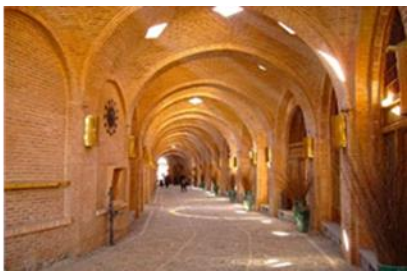
The Effects Created by Perception Elements in the Space	***Continuity:*** Space was built according to the principles of continuity and rhythm (Figure 24).
	 
	Figure 24. Continuity and rhythm in the design of the bazaar
	Material: The material used in the space is brick (Figure 25).
	 
	Figure 25. The use of brick as the main material in the bazaar
Architectural Features	The sunbeam halls were made for lighting and air circulation purposes inside the domes, arches, and vaults. The purpose of the continuity in the space is to create movement, curiosity, and rhythm. The material used in the construction was chosen among those suitable for the climate where space is located. Since the city has a cold climate, brick is the most suitable material to keep the inner space warm despite the cold weather outside.
The Effects Created by the Space	Curiosity, movement, continuing till the end of the space, the effects created by the climate.

Table 5. Analysis Sense of Place of Nasir-Ol Molk Mosque

Nasir-Ol Molk Mosque, Shiraz, Iran, 1888	
Spatial Perception Elements	Mathematics and Geometry, Color, Reflection, Nature, Texture.
The Effects Created by Perception Elements in the Space	***Mathematics and Geometry:*** Mathematics and geometrical shapes create a well-arranged and peaceful space based on specific proportions in inner and outer areas (Figure 26).
	  
	Figure 26. Mathematical forms of the mosque

Table 5. Analysis Sense of Place of Nasir-Ol Molk Mosque (Continues)

The Effects Created by Perception Elements in the Space	***Color:*** All three dimensions of the space are embellished with colors. Due to the colors used in the glasses and ceramics, a color element is largely emphasized in this mosque (Figure 27).
	 
	Figure 27. Colorful glasses and tiles of the mosque
	Reflection: The stained-glass colors in the windows bring vividness and splendor to the mosque when reflected in the inner areas (Figure 28).
	  
	Figure 28. The Colorful reflections in the mosque
	Nature: The use of water as a central element in outer space and the presence of drawings related to nature signify the importance of nature in the perception of space and emphasize the merge of nature with space both abstractly and concretely (Figure 29).
	 
	Figure 29. Nature was used concretely and abstractly in the design of the mosque
	Texture: There are architectural textures in inner and outer areas, mainly on the domes and vaults (Figure 30).
	  
	Figure 30. The textures on the facade of the mosque

Table 5. Analysis Sense of Place of Nasir-Ol Molk Mosque (Continues)

Architectural Features	They are revitalizing nature in the space through colors and tile designs. We create a familiar and peaceful atmosphere by using mathematical and geometrical proportions to construct the space. The regular and proportioned use of geometrical shapes in inner and outer space ensures relaxation and quick interaction with space.
The Effects Created by the Space	Peace, spiritual feelings, being in touch with nature, dynamism, being closer to Allah, relaxation, feeling like in heaven, a design based on geometrical proportions and mathematical shapes, the value and power of handicraft.

Table 6. Analysis Sense of Place of Tabatabaei-ha House

Tabatabaei-ha House, Kashan, Iran, 1919	
Spatial Perception Elements	Dimensional, Thermal, Mathematics and Geometry, Circulation, Color, Reflection, Nature, Form, Material.
The Effects Created by Perception Elements in the Space	***Dimensional:*** The design of the rooms' sizes according to the climate conditions (Figure 31, 32).
	 
	Figure 31. The summer rooms Figure 32. The winter rooms
	Thermal: Different temperatures in various places in the house (Figure 33, 34).
	 
	Figure 33. The summer rooms located in the shadowy areas Figure 34. The winter rooms that receive the sunlight
	Mathematics and Geometry: The traditional and mathematical designs based on geometrical proportions in inner and outer areas (Figure 35, 36).
	 
	Figure 35. Symmetrical design in the facade of the house and geometrical shapes in the inner areas

Table 6. Analysis Sense of Place of Tabatabaei-ha House (Continues)

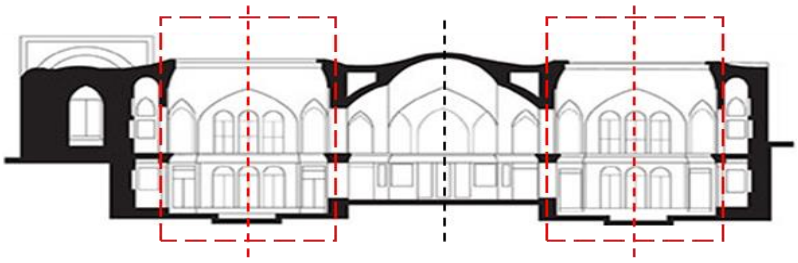
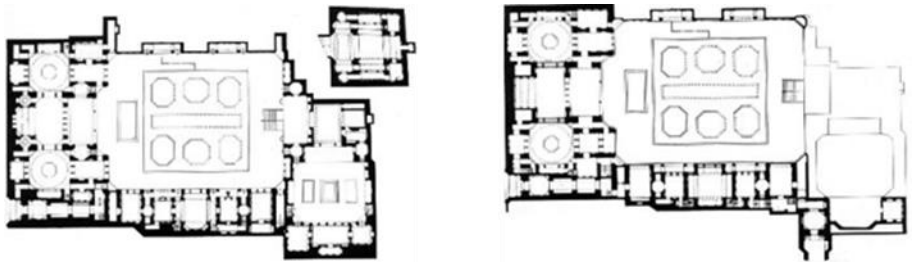
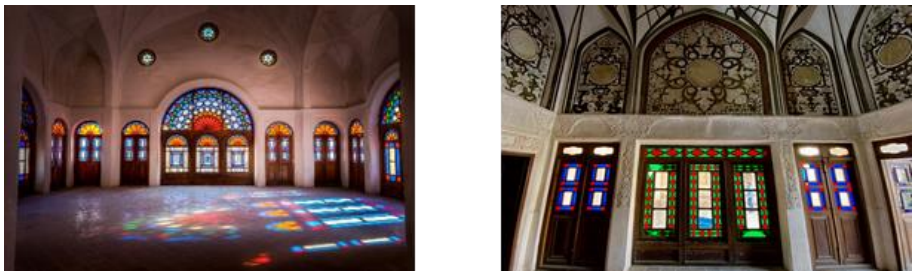
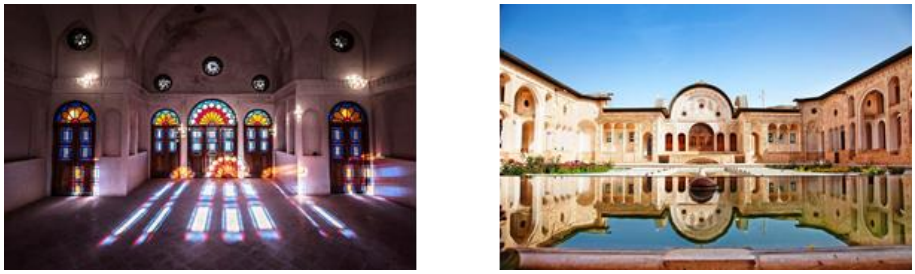
The Effects Created by Perception Elements in the Space	
	Figure 36. The symmetrical design of the building on an intersection plane (Haji-Qassemi, Ganjnameh; Mansions of Kashan, 2015, p. 117)
	Circulation: The unique circulation in the space (Figure 37).
	
	Figure 37. Circulation plan of the house (Haji-Qassemi, Ganjnameh; Mansions of Kashan, 2015, pp. 115-116)
	Color: The light color used in the facades and colorful windows in the rooms (Figure 38).
	
	Figure 38. The windows with stained glasses in the room
	Reflection: The reflection of the whole facade on the pool located in the garden and the reflection of windows' colors in the inner space (Figure 39).
	
	Figure 39. The reflection of outer space on the pool
	Nature: Large-sized pools and green areas in the gardens (Figure 40).

Table 6. Analysis Sense of Place of Tabatabaei-ha House (Continues)

<table>
<tr><td rowspan="8">The Effects Created by Perception Elements in the Space</td><td>   </td></tr>
<tr><td>Figure 40. The pools and green areas in the gardens of the house</td></tr>
<tr><td>Form: Unique architectural solutions which do not exist in other places (air tunnel) (Figure 41).</td></tr>
<tr><td>   </td></tr>
<tr><td>Figure 41. The architectural forms on the roofs, which are unique to the climate</td></tr>
<tr><td>Material: Materials are compatible with the prevailing climate conditions (Figure 42).</td></tr>
<tr><td>    </td></tr>
<tr><td>Figure 42. Adobe as the main construction material</td></tr>
<tr><td>Architectural Features</td><td>Considering the climate of the region where the house is located, adobe was used as the construction material and a light-colored facade to prevent hot air from entering the inner space. Large water pools and air tunnels on the roofs were built to create a circulation of cool air. Space circulation was designed based on culture and beliefs and by giving importance to privacy. Room sizes were determined according to their facades; summer: large facade and winter: small facade.</td></tr>
<tr><td>The Effects Created by the Space</td><td>Peace, relaxation, being in touch with nature, mathematical design, the value and power of handicrafts, culture, beliefs, needs, and circulation in the space.</td></tr>
</table>

Table 7. Analysis Sense of Place of Char Fasl Bath

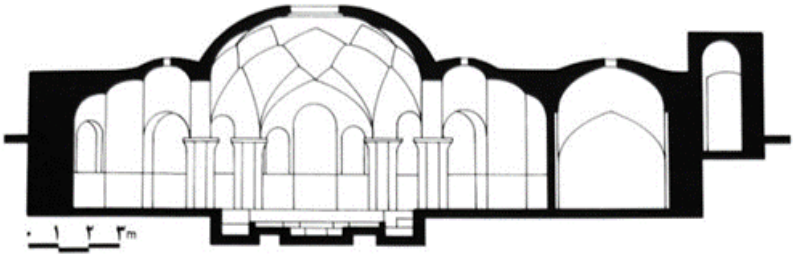
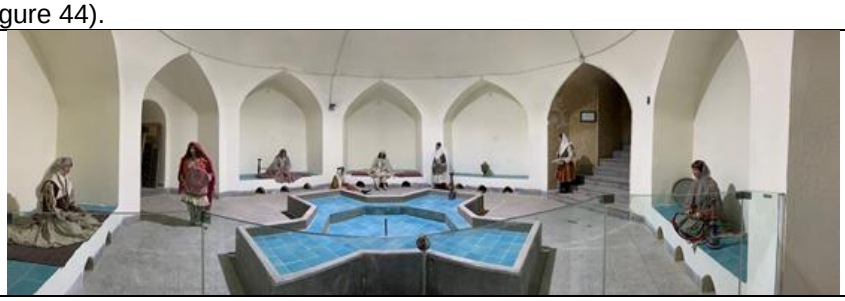
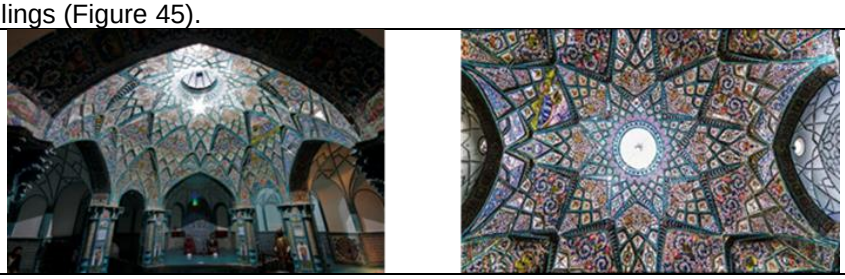
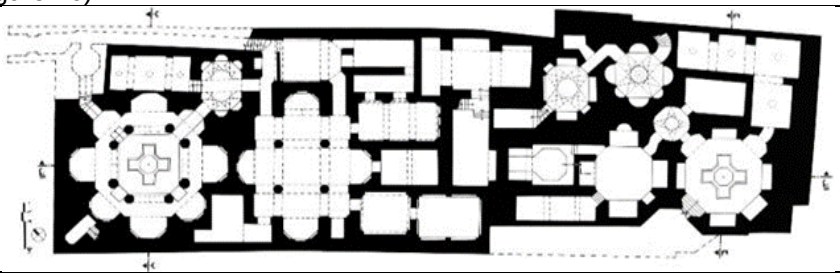
<table>
<tr><td colspan="2">Char Fasl Bath, Arak, Iran, 1925</td></tr>
<tr><td>Spatial Perception Elements</td><td>Dimensional, Thermal, Mathematics and Geometry, Circulation, Color, Light, Nature.</td></tr>
<tr><td rowspan="12">The Effects Created by Perception Elements in the Space</td><td>Dimensional: Celling height and area sizes are different in different units (Figure 43).</td></tr>
<tr><td>  </td></tr>
<tr><td>Figure 43. Different ceiling heights in the units (Zolfaghari, Kordhaghi, & Yamaçlı, 2022, p.55)</td></tr>
<tr><td>Thermal: The temperature of each unit of the space is different from the others (Figure 44).</td></tr>
<tr><td>  </td></tr>
<tr><td>Figure 44. The special place for women to undress (warm area)</td></tr>
<tr><td>Mathematics and geometry: The use of geometrical shapes and mathematical proportions creates splendid architecture, especially on the ceilings (Figure 45).</td></tr>
<tr><td>  </td></tr>
<tr><td>Figure 45. The use of geometrical shapes in the inner space</td></tr>
<tr><td>Circulation: There is an exceptionally unique circulation plan for space (Figure 46).</td></tr>
<tr><td>  </td></tr>
<tr><td>Figure 46. The circulation plan for the bath (Zolfaghari, Kordhaghi, & Yamaçlı, 2022, p.55)</td></tr>
</table>

Table 7. Analysis Sense of Place of Char Fasl Bath (Continues)

<table>
<tr><td rowspan="11">The Effects Created by Perception Elements in the Space</td><td>Color: The most dominant colors in the space are blue and green (Figure 47).</td></tr>
<tr><td>  </td></tr>
<tr><td>Figure 47. The colors used in the inner space</td></tr>
<tr><td>Light: There are holes for the sunbeams to enter separate places in the space (Figure 48).</td></tr>
<tr><td>  </td></tr>
<tr><td>Figure 48. The sunbeams holes in the bath</td></tr>
<tr><td>Nature: There are pools, decorative pools, fountains, and nature drawings in the space (Figure 49).</td></tr>
<tr><td>  </td></tr>
<tr><td>Figure 49. The tiles designs reflecting the nature</td></tr>
<tr><td>Architectural Features</td><td>The sunbeam holes were built to balance the steam and air proportion of the space and lighting. The use of blue and green colors was preferred to create a peaceful atmosphere. The circulation plan was based on the body's getting used to the temperature inside and preventing energy loss. To maintain thermal balance, the size and ceiling height of the units were different from each other.</td></tr>
<tr><td>The Effects Created by the Space</td><td>Peace, relaxation, being in touch with nature, mathematical design, the value and power of handicrafts, culture, beliefs, needs, and circulation in the space.</td></tr>
</table>

7. Conclusion

The abstract and concrete perception factors discussed through the vernacular and historical buildings mentioned above are influential in building perception of space, which affects dynamism, variety of use, and sustainability of the space.

Table 8 displays whether abstract and concrete elements leading to the build-up of perception of space had any effects on the perception of space in the examples examined in this study. The factors affecting the perception of space are classified into two groups: tangible and intangible elements (Table 8).

Table 8. Perception Elements Affecting Perception of Space in Study-specific Buildings

Building	**Types of Spatial Perception with tangible Item**								**Types of Spatial Perception with an intangible Item**				
	Dimensional	**Thermal**	**Mathematics**	**Circulation**	**Color**	**Light**	**Reflection**	**Nature**	**Continuity**	**Form**	**Material**	**Texture**	**Nature**
Sheikh Lotfollah Mosque	×	×	✓	×	✓	✓	×	✓	×	✓	×	✓	×
Nasir-Ol Molk Mosque	×	×	✓	×	✓	×	✓	✓	×	×	×	✓	✓
Tabatabaei-ha House	✓	✓	✓	✓	✓	×	✓	×	×	✓	✓	×	✓
Qazvin Grand Bazaar	×	×	✓	×	×	✓	×	×	✓	×	✓	×	×
Char Fasl Baths	✓	✓	✓	✓	✓	✓	×	✓	×	×	×	×	✓

The perception of space in Sheikh Lotfollah Mosque is built through six perception factors. Light, color, mathematics and geometry, and nature perceptions as immaterial elements, and the form and texture perception as concrete elements play an essential role in building space in this mosque. The examination of these perception elements showed that Sheikh Lotfollah Mosque was rich in immaterial elements. In Qazvin Grand Bazaar, there are four perception factors regarding the perception of space. Light, mathematics, and geometrical perceptions as immaterial elements and material and continuity as concrete elements play an essential role in building the perception of space in this bazaar. Examining these perception elements revealed an equal effect of concrete elements and immaterial ones on the perception of space in Qazvin Grand Bazaar. Five perception factors were identified for Nasir-Ol Molk Mosque. Color, mathematics and geometry, reflection perceptions as immaterial elements, and texture and nature perceptions as concrete elements play an essential role in building perception of space in Nasir-Ol Molk Mosque. The examination of these perception elements showed that Nasir-Ol Molk Mosque was rich in immaterial elements.

The perception of space in Tabatabaei-ha House is based on nine perception factors. Color, mathematics and geometry, reflection, circulation, thermal and dimensional perceptions as immaterial elements, form, nature, and material perceptions as concrete elements are essential in building space in this house. The examination of these perception elements showed that Tabatabaei-ha House was rich in immaterial elements.

The perception of space in Char Fasl Bath is affected by six perception factors. Light, color, mathematics and geometry, nature, circulation, thermal perceptions as immaterial elements, and nature – in addition to being an immaterial element- as a concrete element play an essential role in building the perception of space in this bath. The examination of these perception elements showed that Four Seasons Bath was rich in immaterial elements.

This paper Iran examined the effects of design elements on the perception of space for the study-specific historical buildings and concluded that these spaces are rich in abstract elements as well as solid and concrete elements, and the presence of these two essential groups of elements result in a higher level of spatial perception. The important role of non-abstract perception elements in building perception of space in these buildings gave them a special status, making them historically and architecturally valuable. In addition, the perception factors as concrete and abstract elements, which were explained in this paper, helped these historical places to continue to exist until now. Perception factors have contributed to the dynamism of these historic buildings and their value and sustainability. That is why historical buildings are valuable in terms of perception parameters in addition to their historical values. Therefore, we should not assume that these buildings are simply historical buildings. Their spatial features should be examined in detail to be used as design principles in future design attempts.

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