
A Research on Factors Affecting Visual Perception in Architecture

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Abstract

The mental processes that an individual starts to develop from the moment he/she is born and continue throughout his/her life differ according to the society, level of education, past and current cultural environment and the experiences he/she is going through. Visual perception may differ from individual to individual. Therefore, the quality of the visual formations in the environment is an important factor in the formation of visual perception. Visual perception is a component that enables users and designers to meet in a common language, in other words, it has an impact on how architects present the design to users. It can be said that architecture and design is a discipline shaped around visibility and has an important role in the perception environment. Therefore, it is important for both the user and the designer architect to create the structures and designs to be designed by taking into account the title of visual perception. Visual perception criteria should not be ignored, especially in the design of living spaces or places where more time is spent. It is aimed to examine the factors affecting visual perception.

Keywords

Architecture, Perception, Visual Perception, Design, Space, Proportion, Form, Shape, Form, Color, Texture

1. Introduction

Visual perception and perception play an important role in architecture and design. In order for human beings to be in a harmonious relationship with the built environment, they need to establish a psychological, physiological and biological balance by reacting to external influences. The human being's ability to show this harmony requires him/her to recognize the environment, in short, to perceive it (Aydintan, 2001). Visual perception is a factor that should be taken into account in the field of architecture because how the space is perceived and how it creates an effect on the user, as well as how users experience this space, has a direct impact on design and visual perception. The space created by the combination of visual perception parameters (such as color, texture, form) can cause different effects on users. In this article, the basics of perception and visual perception in architecture will be discussed and the importance of visual perception in the design process will be examined.

The aim of this study is to determine the design criteria that are effective in creating a quality design for users in

the context of visual perception. This article is a review article created through literature review and synthesis. The review article aims to examine the components that affect visual perception through the examination of existing research from past to present. The reliability of this research is ensured by indicating the literature sources used in the research process at the end of the article.

2. Perception

People have to recognize and understand the environment in order to benefit from it, adapt to it or adapt it to themselves. This is realized by receiving information from the environment. Perception is the interpretation and evaluation of this information (Schulz 1971).

All physical stimuli coming from the environment and hitting the living being are converted into neural, chemical or electrical energy through sensation and reach the brain through certain nerve pathways. Processing takes place in the brain, then information is formed and stored. This process is called the perception process (Çağlayan, et al., 2014).

3. Types of spatial perception

If we classify the types of spatial perception according to our five senses, these are visual, dimensional, auditory, tactile and olfactory perception (Çağlayan et al. 2014).

Visual Perception: The eye is an active organ, but perception is not completed with the eye alone. What is perceived with the eye is transmitted to the brain and then the system called the mental process begins. With the influence of the mind, the meaning of what is seen is tried to be interpreted, analyzed and visual perception is completed.

Dimensional Perception: If dimensional perception is defined for the discipline of architecture, it can be interpreted as defining and perceiving the dimensions of the formations in the space. This type of perception has an impact on both architecture and the user.

Auditory Perception: It supports other types of perception in perceiving the space. Depending on the number of senses, perception can be strengthened and a more accurate conclusion can be reached. The sounds in the space help our sense of sight to perceive that space (Ittelson and Proshansky, 1974).

Tactile Perception: The sense of touch, together with the sense of sight, has an effect on learning and making sense of textures and surfaces. Hall (1966) said, "The individual is not content with looking at objects, he wants to touch and experience them. Thus, a more precise perceptual result can be reached". Therefore, taking tactile perception into consideration in space design has an impact on user perception.

Olfactory Perception: The smell or scents that a space or area has can cause a difference in user behavior and perception. For example, floral, fruity, woody or other odors in the space can have a guiding effect on users and can create a guiding effect on their movements.

4. Factors affecting visual perception in architecture

In order for human beings to be in a harmonious relationship with their environment, they need to establish a biological, physiological and psychological balance by reacting to external physical stimuli (effects). The human being's ability to show this harmony requires him/her to recognize the environment, in short, to perceive it (Aydıntan, 2001). Visual perception in architecture is important to understand

how users perceive and feel the space. It can be said that visual perception determines the meaning and expression of architectural designs. The visual elements of a space or building play a role in reflecting the intended use of the space.

The field of architecture and design is a related discipline intertwined with visuality. In the field of architecture, design elements are expressed as color, form and texture; design principles include some common concepts (Aydınlı, 1986, p.39). Color, texture, form and all kinds of furnishing elements within the space constitute the data coming from visual sensation in our process of perceiving and understanding the space. Environmental stimuli such as heat, light, ventilation together with the usage criteria and fiction of these data can change the perception in the space [1].

4.1. Form

The concept of form in architecture is the holistic, general order of the form of the object or space (Onat, 1995). All entities in the environment have curvilinear or geometric forms. The use of these forms in architecture can be used in the context of visual perception by considering functionality, aesthetics and many similar criteria in terms of design. When creating forms in space design or design elements, the function of the space should be considered together with the function of the space and the aesthetic and psychological impression and perception should be taken into consideration and the design should be created in this direction. The forms used can have psychological effects on individuals such as fear, confidence, excitement or attracting attention. In this context, the spaces or objects designed can be created in parallel with the effect of the form on the user.

The psychological effects of form on people may also vary according to the way it is used. The parameters used in the design of a space may have different effects from user to user. The form of a design can affect the impressions it leaves on people. For example, wide spaces can create a feeling of spaciousness and freedom, while narrow and flat spaces can create a feeling of congestion.

4.2. Color

Another sub-heading among the factors affecting visual perception is color. The color-related characteristics of the space can cause various psychological perceptions in users. A range of colors can be used to emphasize the form of the space or other design elements. According to the color used in the design, object dimensions, proximity or distance perception may occur. It has also been found that light colored surfaces are perceived to be larger in size than dark colored surfaces (Işingör et al., 1986). Color, in connection with the level of illumination, helps the space to assume certain characteristics such as being big, small, hot, cold, energetic, boring, calming according to the action to be performed in it (Sağocak, 2005).

At the same time, the effects of colors on users can be mentioned. Any color can create a negative effect when used alone, or it can turn into a positive effect when complemented with different colors. For example, although brown usually creates a melancholic, mournful and unhappy effect, it creates a soothing and relaxing effect when used with white, orange or yellow (Reekie, 1972, p.22). While cold colors generally create calmness, comfort and relaxing effects, warm colors create effects such as vitality, joy and excitement (Altınçekiç, 1994).

Choosing the colors to be used in space design according to the elements of the space is effective in terms of design. For example, the use of a range of colors with a warm effect on the walls can make the space look narrower than it is, while pastel tones and cool colors can have a refreshing effect.

Colors and their psychological effects have been studied from past to present. According to Bereketoğlu [2], some colors are defined as follows:

- Red: It evokes a feeling of energy and excitement. Excessive use can trigger anger.
- Yellow: It is a source of happiness and joy. However, its use in a too bright tone can cause eye strain.
- White: It represents cleanliness and innocence. However, its excessive use can create a feeling of coldness and emptiness.

- Blue: Gives a sense of calm and confidence. It is an ideal color choice to reduce stress and increase concentration.

- Green: Reminiscent of nature and creates a sense of peace. It is an ideal color choice for those in search of balance and peace.

- Purple: It represents power and creativity. Its darker shades encourage deep thought and spirituality.

4.3. Tissue

Textures can strengthen the emotional impact of a space and enhance its visual aesthetics. Texture in space is defined by seeing, feeling and touching. In architectural designs, texture is created by the combination of various surfaces and materials. The different textures of wood, stone, concrete, glass, metal and similar materials are effective in determining the atmosphere of the space.

The texture of an object's surface affects spatial perception (Castell et al. 2019 p.1). Each material has a unique texture. Various texture criteria used in design can be perceived with different sensations in each user. For example, a soft and tactile surface can create a feeling of comfort, while a hard and rough surface can make you feel different emotions.

The texture preferred in the space or design can be said to be one of the titles that may have the feature of strengthening the emotional effect of the environment and may also have the effect of increasing visual aesthetics. Texture in space is defined by the sense of sight, feeling and touch. In architecture, it is formed by the combination of various materials and surfaces.

4.4. Material

The choice and use of materials in architectural design can be said to be one of the most fundamental elements that make up the design and can affect the visual perception of the space. Each material has a unique texture and surface and these differences can affect the design. For example, material differences such as the glossy structure of glass, the rough surface of natural stones and the grain texture of wood can provide visual diversity in the space. When we look at the perception of materials in architecture, we can consider the issue from two different perspectives. The first

is the user's perception of the material and the second is the architect's relationship with the design. The properties that explain the interaction between the user and the material with the help of the five senses are defined as sensory properties (Seçkin, 2010). At the same time, material is also related to texture. Because the material is included in the space with its texture. In the delimitation of the space, the visual values and physical properties of the material find their subjective expression through the texture of the material (Şen, 2009).

4.5. Light

Light is the physical force perceived by the sense of sight that enables objects to be seen and colors to be distinguished (Hasol, 2008). Light is one of the factors affecting the visual perception of space in architectural design. It can differentiate the sensory experience of the space by affecting the form, atmosphere and texture of the design. The types of light used in architectural design can generally be analyzed in two categories: artificial light and natural light. Natural light comes from outdoor sources such as daylight and sunlight, while artificial light comes from indoor sources such as lighting systems. Both types of light can affect the atmosphere and perception of the space. Factors such as the color and intensity of light are among the elements that should be considered in designs.

The amount of reflection on the intensity of daylight can be provided by using openings in different positions and sizes in space design.

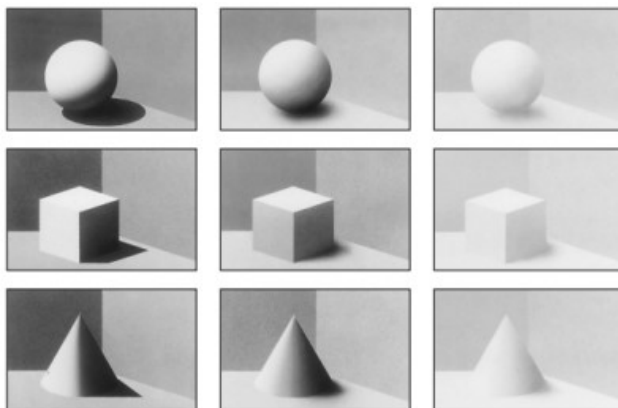


Figure 1. Appearance of three-dimensional forms under different lighting conditions (Şentürk, 2021)

Correct and appropriate lighting used in architectural design can increase the functional qualities of the space and strengthen its effect on users. It can be said that the color factor is also effective in the use of light. The harmony between light and color may vary depending on the area of use. In a room with two windows opening to both south and north, the same gray wall has a warm tone next to the south window and a cold tone next to the north window (Rasmussen, 1970).

5. Conclusion

This article aims to understand how visual perception is shaped by various factors and criteria. It includes the effects of components such as form, color, texture, material and light on visual perception. The different effects of the color choices used in the designs, which we can call warm or cold, on the users are mentioned. In addition, with regard to the lighting criterion, this article emphasizes the contribution of natural and artificial lighting to the form and spatial experience of the design, and the effects of other criteria such as form, texture and material in the context of visual perception.

In this study, it is aimed to examine the visual perception criteria that may have an impact on the space and the user. Five different criteria were created for this purpose. These are form, color, texture, material and light. When the research findings are evaluated in general, it is determined that form, color, texture, material and light criteria are perceptually effective criteria for users and designers. As a result, it is concluded that visual perception in architecture is important in terms of issues such as space design and its effects on individuals and can contribute to the designed spaces.

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