

Section 8. Psychology

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THE PSYCHOLOGY OF SPACE PERCEPTION AND THE INFLUENCE OF DESIGN ON THE EMOTIONAL STATE

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Abstract

The article discusses the fundamental principles of space perception psychology and their influence on a person's emotional state. It analyzes key factors in interior design, such as color, lighting, scale, and space organization, which shape psychological responses and mood. Special attention is given to the connection between the visual and emotional aspects of perception, as well as methods for using design to create a comfortable and harmonious environment. The findings have practical implications for architects, designers, and psychologists.

Keywords: *psychology of perception, interior design, emotional state, color in the interior, lighting design, organization of space, visual perception, comfort*

Space perception is a complex process that allows people to understand and interpret their surroundings. The psychology of space perception examines how we perceive the size, shape, and location of objects, as well as the impact these factors have on our emotional state and behavior. The environment we create through design has a direct impact on our comfort, safety, and emotional well-being. Space design is not merely about aesthetics; it influences our mood and evokes certain emotions. Research has shown that color, lighting, the scale of objects, and the arrangement of space can all elicit various emotional responses.

For example, warm colors and softer lighting create a sense of comfort, while cooler

shades and brighter lights promote focus and concentration. Understanding these principles can help designers create spaces that enhance the well-being of those who inhabit them.

Understanding the psychology of spatial perception is crucial for architects, interior designers, and psychologists, as it aids in creating environments that positively impact a person's emotional and mental state. In today's world, where most people spend a significant amount of time indoors, the importance of harmonious design is growing, as it contributes to improving the quality of life and overall well-being.

The study of space perception has its origins in the philosophical and scientific

thoughts of ancient times, when thinkers like Plato and Aristotle pondered the nature of perception and humans' connection with the world around them. However, it was only in the late XIX and early XX centuries that systematic research into the psychological aspects of spatial perception began, thanks to the development of experimental psychology.

The founders of Gestalt psychology, including Max Wertheimer, Wolfgang Köhler, and Kurt Koffka, made important contributions by emphasizing that perception is a holistic and organized process, and that the perception of space depends not only on individual elements but also on their relationship with each other.

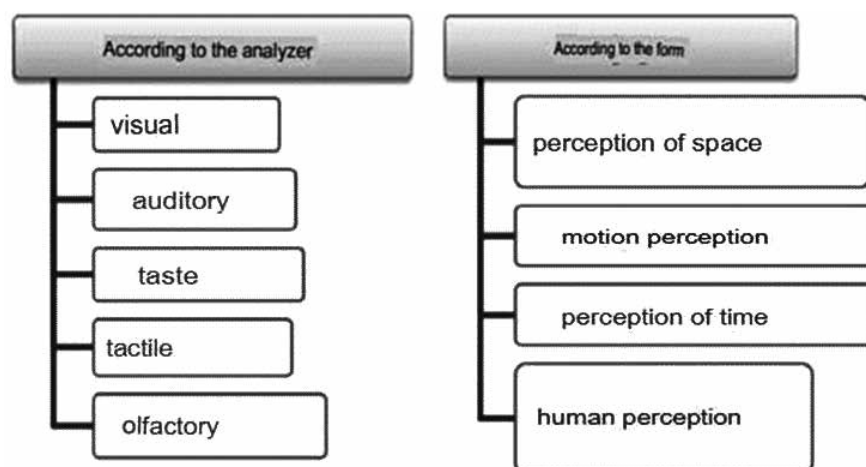
In the XX century, Gestalt theory became the basis for understanding how people organize visual information and perceive space as a whole. This influenced further research in design and architecture. In the 1950s and 1960s, with the development of cognitive psychology, studies of spatial thinking, orientation, and the role of memory in envi-

ronmental perception began. One important direction was the study of how light, color, shape, and proportions influence a person's emotional state.

At the same time, fields such as ergonomics and architectural psychology were emerging, where attention was paid to the interaction between humans and space in order to create comfortable and functional environments. The work of scholars like Erwin Goffman and Donald Norman highlighted the significance of design in influencing human emotions and behaviors. In the 1970s and 1980s, studies began to emerge on the impact of environmental psychology, exploring how physical environments, including natural and urban spaces, affect the human mind.

In modern research, there is a shift towards the integration of cognitive, emotional, and cultural aspects of space perception. This field of study is closely linked to neuroscience, which focuses on the neurobiological mechanisms involved in the processing of spatial information (see Fig. 1 for an example).

Figure 1. *Types of perception*



At the same time, interior and architectural design is seen as a tool for creating an emotional state. The use of color, lighting, textures, and space layout can help create conditions for psychological comfort, reduce stress, and increase productivity.

The history of studying space perception psychology reflects the transition from philosophical reflection to multidisciplinary research combining psychology, neuroscience, and design. This research aims to understand and improve human interaction with the environment, as well as the impact

of design on emotional well-being (Pankina, M. V., 2012).

It should be noted that the psychology of space perception and the influence of design on the emotional state have been well studied, and they continue to be relevant and evolving areas of research. The level of knowledge in these fields can be considered high, in terms of both theoretical understanding and practical applications. However, there is still significant potential for future research, especially with the advent of new technologies and the integration of interdisciplinary approaches (Table 1).

Table 1. *The impact of design on the emotional state*

No.	Indicator	Characteristic
1.	The color palette	Colors can evoke different emotions. Warm colors, such as red and orange, can create feelings of energy and excitement. Cool colors like blue and green are associated with calmness and tranquility. Choosing the right color scheme for your home or product packaging can help boost your mood and draw attention.
2.	Shape and texture	Shapes (round, angular) can also influence perception. Round shapes convey a sense of friendliness and safety, while sharp angles may be perceived as aggressive or intimidating. Texture (smooth, rough) can create tactile associations and impact comfort. For instance, soft textures can induce a feeling of comfort.
3.	Space and layout	Spacious and organized spaces create a sense of freedom and clarity, whereas overloaded visual elements can lead to stress and anxiety. A well-designed layout helps you focus and makes it easier to process information.
4.	Lighting	Natural lighting has been shown to improve mood and productivity, while artificial lighting can lead to fatigue and depression. The use of different light sources, such as wall lamps and lamps, can create a cozy and comfortable atmosphere.
5.	Psychology of perception	Design is also related to the psychology of perception. A well-designed interface can reduce stress levels by making interactions more intuitive.

The theoretical basis of the psychology of space perception is rooted in the classical principles of Gestalt psychology and research in cognitive psychology and neuroscience. We know that humans perceive not individual objects, but rather integral structures, in which the organization of elements within space plays a significant role. The mechanisms behind spatial perception are linked to brain functions such as visual and sensory integration, which are being thoroughly explored through neuroimaging techniques and psychological experiments. Additionally, there is a wealth of research dedicated to understanding the influence of spatial parameters such as size, shape, light, and color on cognitive processes and emotional states (Lukash, A.A., 2023).

As for the impact of design, numerous empirical studies have confirmed that interior spaces, designed with the psychological characteristics of human perception in mind, can significantly improve emotional states, reduce stress, increase productivity, and create a more comfortable environment. In particular, the correct use of

colors, lighting, textures, and proportions affects mood, perception of safety, and the overall psychological atmosphere. Design is focused on creating a space that supports emotional well-being, and this approach is actively used in residential, public, and work environments.

Despite the high level of knowledge in this field, there are still challenges and areas for further development. One of these areas is the influence of cultural and individual differences on our perception of space. This topic requires deeper study to fully understand it. Modern virtual and augmented reality technologies offer new possibilities for exploring and analyzing spatial effects on our emotions. Interdisciplinary research that combines psychology, architecture, neuroscience, and design is essential for expanding our understanding of this complex relationship between space and emotion (Frolova, N.Y., 2021).

It should be noted that modern psychology of perception and the influence of design on emotional state are actively integrated into various fields, from architecture and

urban planning to interior design for work and living spaces. In recent years, there has been a growing trend towards personalizing spaces more deeply, taking into account psychological needs and emotional comfort.

This modern practice is based on data from neuroscience and cognitive psychology, which allows us to better understand how people perceive spaces. For example, the right combination of colors, lighting, shapes, and textures not only enhances aesthetic perception but also affects stress levels, motivation, and concentration directly. Today, virtual reality research methods are widely used to test designs in simulated environments and find optimal solutions for specific tasks and user groups.

The concept of biophilic design has gained significant attention in the field of architecture and design. It involves incorporating natural elements and features into spaces in order to improve emotional well-being, enhance creativity, and reduce anxiety. This approach emphasizes the importance of creating adaptive and multifunctional environments that consider ergonomics, personal space, and social interactions.

In office design, a lot of attention is paid to creating areas for relaxation and privacy, which is seen as an effective way to reduce emotional burnout and increase productivity. Similarly, in educational and medical institutions, design is used to create a positive atmosphere that has a positive impact on recovery and learning.

Furthermore, modern practice takes into account the results of research on cultural differences in space perception, allowing for the creation of interiors and urban spaces that best meet the needs and expectations of different ethnic and social groups.

The challenges of studying and applying knowledge about spatial perception and the effects of design on emotional states are diverse and relate to both the methodology and the practical aspects of implementing this knowledge.

One of the main challenges is the difficulty in objectively measuring and understanding subjective phenomena such as emotions and perception of space. A person's emotional state and feelings are influenced by a variety of factors, including individual character-

istics, cultural background, past experiences, and current physiological state. This makes it challenging to create universal models and guidelines, as each person's experience is unique.

The variety and variability in reactions necessitate the use of complex and multidisciplinary research methods, such as psychology, neuroscience, anthropology, and sociology. This approach requires extensive resources and the coordination of experts from different fields. However, this is not always feasible in practical settings.

Another significant challenge is the limited range of methods that can fully replicate and analyze the experience of space in real-life settings. Research is frequently conducted in laboratories or virtual environments, which may not always accurately reflect real-world circumstances. For instance, while virtual reality can provide valuable data, technical limitations and the absence of fully developed sensory and emotional experiences can distort perceptions, potentially rendering the findings less relevant to actual living spaces.

At the level of practical application of the psychology of space perception and design, integrating acquired knowledge into architectural and design projects presents a challenge. Often, effective collaboration between psychology experts and designers is lacking, as economic and time constraints lead to the simplification or neglect of psychological aspects. Additionally, interior and architectural designs frequently prioritize aesthetic or functional considerations without adequately addressing their impact on users' emotional states, thereby reducing the quality of the resulting space.

Challenges also arise in adapting universal recommendations to different cultural, social, and individual contexts. What may positively impact emotional well-being in one culture might not be as effective or could even have a negative impact in another. This necessitates researchers to explore contextual factors more deeply and develop flexible approaches, making the process of designing and implementing solutions more complex.

Furthermore, a significant challenge lies in the scarcity of long-term studies demonstrating the sustainability and effectiveness

of psychologically sound design solutions. Most research tends to focus on short-term outcomes, whereas the perception of space and associated emotions can evolve over time as people adapt to new circumstances.

In general, the challenges of studying and applying the psychology of space perception and design to emotional states represent a complex interplay of scientific, technical, cultural, and organizational issues. Addressing these challenges requires an interdisciplinary approach, innovative research methods, and increased collaboration among scientists, designers, and project stakeholders to create truly comfortable and emotionally supportive environments.

In our opinion, addressing issues related to the study of space perception psychology and the impact of design on emotional state requires a holistic, systematic approach. Firstly, it is essential to conduct interdisciplinary research that brings together psychologists, neuroscientists, designers, architects, and sociologists. This approach will allow us to create more comprehensive and universal models of perception that take into account individual, cultural, and social factors, as well as integrate psychological data effectively into space design.

To increase the objectivity and relevance of the results, it is essential to use modern technologies such as virtual and augmented reality, biometric sensors, neuroimaging methods, and analysis of physiological reactions. These technologies will help to more accurately measure emotional and cognitive responses in controlled but realistic settings.

At the same time, it is crucial to improve the methods and apply them to real-world projects in order to assess the long-term impact of design decisions. An important step is to develop flexible and responsive design protocols that can be customized to meet the

specific cultural and individual needs of users. This requires the creation of personalized recommendations that take into account diverse perceptions and emotional responses, as well as collaboration between psychologists and designers throughout the design process.

It is also essential to establish a system of education and professional development for professionals so that psychological knowledge can become an integral part of the training for designers and architects. This will reduce the risk of overlooking or misusing the psychological aspects of work.

Furthermore, it is crucial to conduct long-term research and monitor already implemented projects to study the effectiveness and sustainability of the applied solutions. The gathered data will help adjust techniques and improve the quality of created spaces, making them more comfortable, functional, and conducive to the emotional well-being of users.

Through the effective application of psychological knowledge, design and architecture can contribute to creating spaces that promote positive emotions, reduce stress, and enhance overall well-being.

To achieve optimal results, it is necessary to adopt an interdisciplinary approach that combines psychology, neuroscience, and design, along with the use of modern technologies for objectively analyzing user reactions. The personalization and adaptation of design solutions based on cultural and individual characteristics are essential, as they increase their effectiveness and acceptance.

The training of specialists and the long-term monitoring of projects ensure continuous improvement in the quality of created spaces. Therefore, integrating psychological principles into design is a key factor in creating harmonious, functional, and emotionally comfortable environments.

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