

Improving The Quality of Designing the Interior Spaces of the Dwelling According to Environmental Psychology

Prof. Omaima Ebrahim Qasem

Vice Dean for Education and Student Affairs - Faculty of Applied Arts, 6th of October University

Kassimomayma56@gmail.com

Prof. Ashraf Hussien

Professor of Environmental Design - Department of Interior Design and Furniture - Faculty of Applied Arts - Helwan University

ashrahus@gmail.com

Assist. Lect. Amira Ahmed Mohamed

Assistant Lecturer - Faculty of Education - Helwan University

Des.amira.ahmed90@gmail.com

Abstract

This research paper studies the relationship between interior design and psychology in general and Environmental Psychology in particular, and the difference between the traditional design process and the design process from the perspective of Environmental Psychology. Which is concerned with studying the inter-relationships between the physical environment and human behavior, even that the main target of interior design is to develop functions, enrich aesthetics and concern the psychological effects of the interior space. We will discuss this relationship through the study of concepts and Terminology of Psychology, Environmental Psychology, Design Psychology, and Interior design psychology through analyzing human behavior within the inner space to understand its impacts. In addition to studying Environmental Psychology, theories that have been created in order to better understand this relationship and develop some different explanations of it. Theories of Environmental Perception that clarify the concept of environmental perception of the human being and how this is reflected on the process of design internal spaces, which contributes to improving the quality of the design of the internal environment for dwelling by studying and deducing design standards from an environmental psychology perspective. The research also studies the effect of environmental stimuli that affect the perception process of the internal space, as in the event that any of the environmental stimuli are disturbed, the human perception of the design stimuli becomes confused and the perceptual process as a whole is disrupted and thus wrong messages are conveyed to the conscious and unconscious mind, which makes the person feel uncomfortable in the space.

Keywords:

Environmental Psychology- Interior design psychology - Environmental Perception- Human behavior- Residential spaces.

Introduction

Now Scientific Research Society is heading for the interdisciplinary studies and studying the impact of different fields on each other. We find that interior design since old times has collected many different sciences together, such as engineering with its various branches, environment,

art, psychology, and other disciplines in order to reach safe, comfortable, enjoyable, and aesthetics feelings in the internal environment, and achieve the desired function of this internal space.

The psychological side of the human being is affected by interior design through several different aspects. As each person receives, perceives, and responds in a different way, due to physical and psychological differences in addition to differences in personal experience, culture, physical condition, age, education level, gender, social and economic class which are all important factors in shaping the needs of the individual. The interaction between interior architecture and the psychological condition is engaged with both humanitarian characteristics and the interior architecture approach of design. A famous quote was Winston Churchill, addressing the English Architectural Association in 1924.

"We shape our buildings; thereafter they shape us."

Winston Churchill, addressing the English Architectural Association, 1924

Problem Statement

The internal spaces are designed with the aim of achieving functional and aesthetical aspects of the space, and although there are many studies dealing with the impact of the built environment on the users, there are deficiencies in observing and analyzing this effect according to environmental psychology and the research problem is trying to answer the following question:

- How does the psychological aspect affect the design of the internal environment from an environmental psychology perspective?

Objectives

- The research aims to study human behavior in the daily internal environment of the dwelling to reach the design criteria from the perspective of environmental psychology.
- Verify the effects of the physical environment (internal space) on the human behavior and psychological state of the user.

Research hypotheses

- Environmental psychology gives a more comprehensive and profound view of the relationship between man and the internal environment with a focus on monitoring human behavior.
- Applying the principles and recommendations of environmental psychology helps us to improve the quality of interior space design.

Research Importance

- It studies the concepts and definitions of environmental psychology, and how to apply them in the design of internal spaces.
- This research paper contributes to clarifying aspects of the relationship between humans and the internal environment and the impact of each on the other.
- It studies the theories of environmental perception of internal spaces because of their importance in analyzing the relationship between man and his environment.

Theoretical Background

Design Psychology

The practice of architecture, planning and interior design in which psychology is the principal design tool according to Toby Israel, For the purpose of Design Psychology, toby has transposed Maslow's theory into a theory of place as "self-actualization." **Fig. no 1**

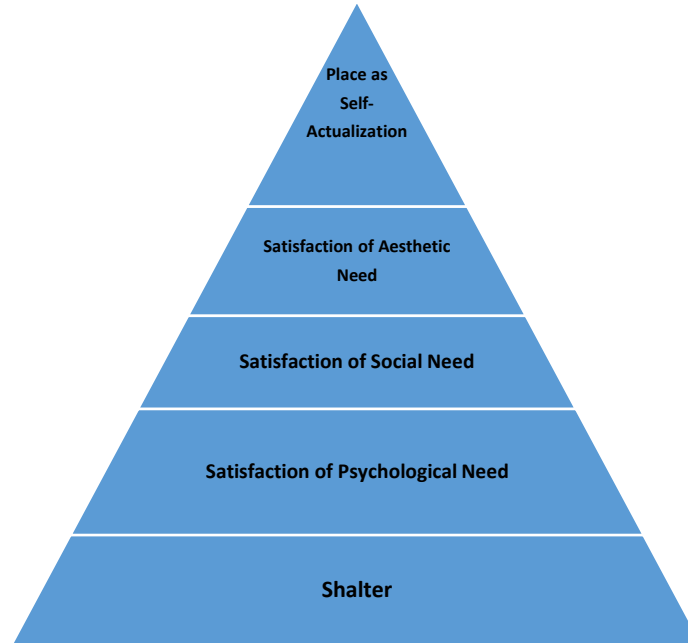


Figure no. 1 Theory of place as "self-actualization."

DEFINITION OF THE TERM ARCHITECTURE

Principles of architecture is creating an atmosphere that protects humans from harmful effects of natural factors and includes the activities of his personal and social life and meets his physical and spiritual needs.

Architectural psychology

The study of the role of the built environment in human behavior, a major subarea in environmental psychology, also called design and behavior.

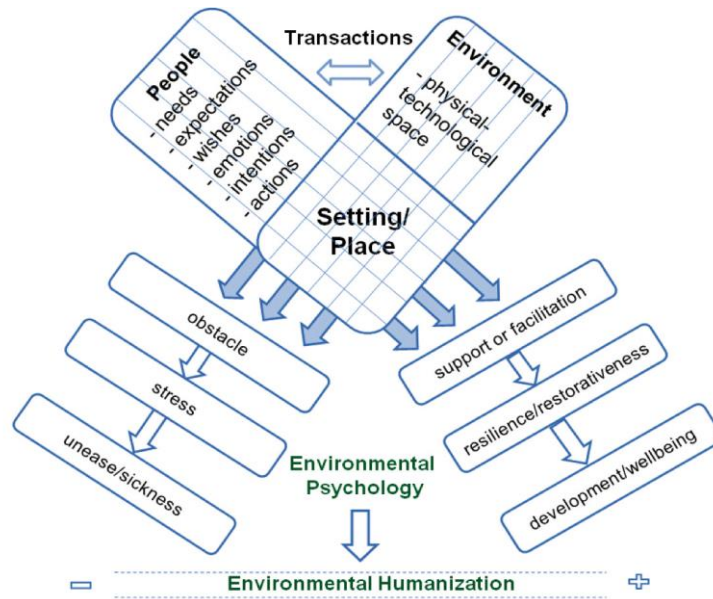


Figure no. 2: Environmental psychology and architectural environments for settings/places of everyday life.

Interior design definition from a psychology perspective:

The importance of interior design stems from the fact that it has a direct relationship with the affairs of each one of us, because we live, eat, drink, worship and have fun in its productions. So we find that our efficiency at work, our health, our psychological states and our happiness depends on the environment designed for us, and this includes in addition to housing and workplaces and places of worship and other things, tools, equipment, and furniture. So the designer's work is useful and creative when it depends on an understanding of the laws of nature and human behavior and needs, in addition to his creative ideas and imaginations.

From the above, we find that what we design from different internal spaces that share our lives with us in all its details, so there must be a common relationship between us and the environment surrounding us. A good design must achieve sufficient conviction for it through our ability to perceive it, comprehend it, and feel that it suits us from all sides, so we note that the perception process is the basic link between design and the user and it is the means of communication that must be clearly understood by the designer.

Interior design psychology

Is a field within [environmental psychology](#), which concerns the environmental conditions of the interior. It is a direct study of the relationship between an environment and how that environment affects the behavior of its inhabitants, intending to maximize the positive effects of this relationship. Through [interior design](#) psychology, the performance and efficiency of the space and the well-being of the individual are improved. Figures like [Walter Benjamin](#), [Sigmund Freud](#), [John B. Calhoun](#) and [Jean Baudrillard](#) have shown that by incorporating this psychology into design one can control an environment and to an extent, the relationship and behavior of its inhabitants.

Psychology of internal space

Psychology of space is in fact “*the study of human relations and behaviors within the context of the built and natural environments*” according to Dave Alan Kopec, a specialist in the field and professor at the New School of Architecture and Design in San Diego. Having a direct impact on your subconscious, contributing to your emotions and perceptions, through that special part of your brain that reacts to the geometry of the space you occupy, interior design became an inherent part of people’s psychology. Though it is not the only factor involved, interior space has big implications, and it is the architect’s responsibility to shape tangible solutions for users and incorporate these ideas into the structure.

Many researches and studies confirm the importance of the psychological aspects of design in influencing the users of space, and from these studies some of the following excerpts:

“Interestingly, recent work has demonstrated that the size of a room can have an impact on the level of openness of people who meet within it.” (Okken, Rompay, & Pruyn, 2013)

“One theory is that in high ceilinged rooms, individuals feel relatively unconstrained and can therefore impact on their thinking styles.” (Levy & Zhu, 2007).

“ It is not just the size of space that has been found to have impacts on psychological functioning— the shape is important, too. Curvilinear spaces have been found to be judged much more beautiful than rectilinear spaces.” (Vartaniana , 2013)

“ A review of findings from the field of environmental psychology shows that humans are aesthetically attracted to natural contents and to particular landscape configurations. These features are also found to have positive effects on human functioning and can reduce stress.” (Joye, 2007)

Environmental Psychology

Environmental psychology is the study of transactions between individuals and their physical settings. In these transactions, individuals change their environments, and their behavior and experiences are changed by their environments.

It includes theory, research, and practice aimed at making the built environment more humane and improving human relations with the natural environment. Considering the enormous investment society makes in the physical environment (including buildings, parks, streets, the atmosphere, and water) and the huge cost of misusing nature and natural resources, environmental psychology is a key component of both human and environmental welfare.

Environmental psychologists work at three levels of analysis:

(a) Fundamental psychological processes like perception of the environment, spatial cognition, and personality as they filter and structure human experience and behavior.

(b) The management of social space: personal space, territoriality, crowding, and privacy, and the physical setting aspects of complex everyday behaviors, such as working, learning, living in a residence and community.

(c) Human interactions with nature and the role of psychology in climate change.

History of the field of environmental psychology

Environmental psychology has been recognized as a field of psychology since the late 1960s and is therefore a relatively ‘new’ field in psychology. Hellpach was one of the first scholars who introduced the term ‘environmental psychology’ in the first half of the twentieth century.

Hellpach (1911) studied the impact of different environmental stimuli, such as color and form, the sun and the moon, and extreme environments, on human activities. In his later work, he also studied urban phenomena, such as crowding and overstimulation, and distinguished different types of environments in his work, including natural, social, and historical- cultural environments. Although the topics of Hellpach are typical of the field of environmental psychology as it has been practiced from the 1960s onwards, it was still too early to speak of an independent field of systematic research into human–environment interactions.

Brunswik (1903–1955) and Lewin (1890–1947) are generally regarded as the ‘founding fathers’ of environmental psychology. Neither of these scholars had significant empirical work that we would classify today as environmental psychology. However, their ideas, such as the interaction between physical environment and psychological processes and studying human behaviors in real-life settings instead of artificial environments, were influential for many later studies on human–environment interactions.

Theories of Environmental Psychology

Now that we are familiar with the term Environmental Psychology, we will examine the perspectives that are created in order to better understand this efficient issue. These theories are listed in the following graph which explanation of each are discussed in the following.

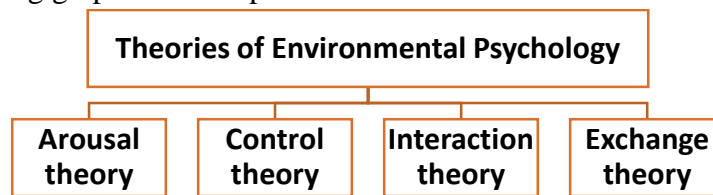


Figure no. 3 Theories of Environmental Psychology

PROCESS OF RELATIONSHIP BETWEEN MAN AND ENVIRONMENT

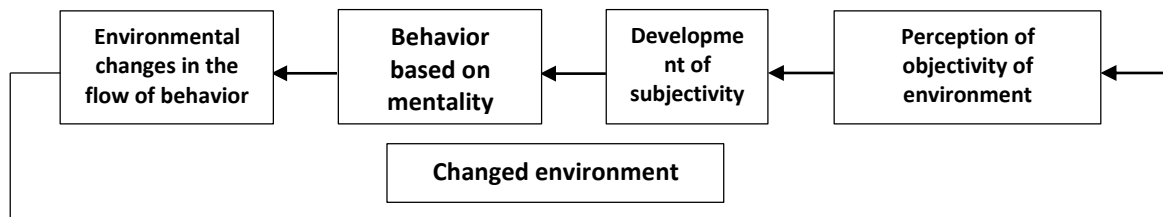


Figure no. 4 presents the process of human-environment relationship

Human-Environment Relationships Theories: Basic theory of Human-Environment Relationships is that humans are affected by multiple factors. There are several main studies that explore this relationship, integration, control, behavior-setting, stimulation.

The Theory	Founder of the Theory	Explain the Theory
<i>Integration</i>	Isidor Chein ١٩٨١-١٩١٢	Isidor Chein identified five elements needed in a design to enable specific behavior within an environment, global environment, instigators, goal objects and noexient, supports and constraints, and directors. Global environments are universal features of the environment.

		<p>Instigators are stimuli within the environment that elicit behavior of individuals. Goal objects and noexient are situations that trigger reactions, positive or negative. Supports and constraints are the elements that affect behavior within an environment. Directors are features that guide people within a space.</p>
<p><i>Control Theory</i></p>	<p>James Averill Social psychologist</p>	<p>Humans feel most comfortable within spaces where they can control aspects of their environment. James Averill identified three types of controls; behavior control – the ability to change events, cognitive control – the ability to change how they regard the environment, decision control – capacity to choose a reaction to events.</p>
<p><i>Behavior-Setting Theories</i></p>	<p>Roger Barker social scientist (1903 – 1990) David Kanouse Behavioral Scientist</p>	<p>In this theory Roger Barker explains that a human’s behaviors are a reflection of the surroundings they inhabit. He states that certain environments elicit difference responses. A study into negativity biases was conducted by David Kanouse, he looked into how the bias plays into evaluation and choice behavior. This gives insight into how people are influenced by information within different settings. When people interact with objects they form conclusions based on various characteristics of the objects. These conclusions can come from a positive standpoint or a negative one; they are different for various people.</p> <p>Kanouse states that when making a judgment, people tend to weigh the negative greater than positive. He also finds that first impressions that are negative are harder to alter than positive ones. There are several reasons for these occurrences, what Kanouse identifies these looking at the micro level to the macro level.</p> <p>The judgment process that people develop elaborates on the above statement. Within this process people tend to weigh negative information in a greater way, because that is how they were taught to view it. One thought is that out of all the information gathered, people gravitate towards the most extreme and then base their judgment off of that.</p> <p>When individuals form a judgment, it is based on prior experiences, which requires a retrieval process. This process, just like the ones stated earlier, can also be influenced by negativity. When humans form a memory they are based on an overall impression. Over time the overall impression changes because of what it relied upon as an example for further behavioral responses.</p>

		These responses don't typically allow for time to exhaustedly search one's memory which can also color a response.
<i>Stimulation Theories</i>	Rachel and Stephen Kaplan	This explores the concept that environments appeal to all five senses and from that information humans can comprehend environments. Rachel and Stephen Kaplan explore this concept in their studies on Attention Restoration Theory. They base their conclusions on the attention humans devote to situations. They found that even though each human has a different level of attention they can achieve, everyone could experience attention deficit and overload. In those situations their restorative experiences are typically through connecting with nature.
<i>Social Learning</i>	Julian Rotter 1916-2014	Julian Rotter developed the social learning theory method of analyzing behavior. He combined learning and personality theories to observe human behavior. Rotter used the empirical law of effect, stating that people are encouraged by positive stimulus, while they stay away from negative, which he felt that previous psychological theories lacked.

Table no. 1 Human-Environment Relationships Theories-the Researcher's work

Defining behavior from an environmental psychology perspective:

In environmental psychology "a behavior is a definable unit of activity initiated by certain inputs which generates certain outputs as a result of its activity."⁸ Psychology is defined as the systematic study of behavior and mental processes. The study of human behavior is considered to be the primary focus of much of the field of environmental psychology.

Environmental Perception Definition

Environmental perception has commonly been defined as awareness of, or feelings about, the environment, and as the act of apprehending the environment by the senses. A more encompassing definition and theoretical framework was provided by psychologist [William Ittelson \(1973\)](#) who described environmental perception as a multi-dimensional phenomenon, as a transactional process between the person and the environment. He offered three general conclusions about the nature of perceiving: first, it is not directly controlled by the stimulus; secondly, it is linked to and indistinguishable from other aspects of psychological functioning; and thirdly, it is relevant and appropriate to specific environmental contexts.

Theories of Environmental Perception

As an interior designer or as a client, how might one look at a room? The simple answer might be, in terms of possible colors, décor, and layout. However, environmental psychologists suggest three other ways that might be fruitful: probabilistic functionalism, affordances, and collative properties:

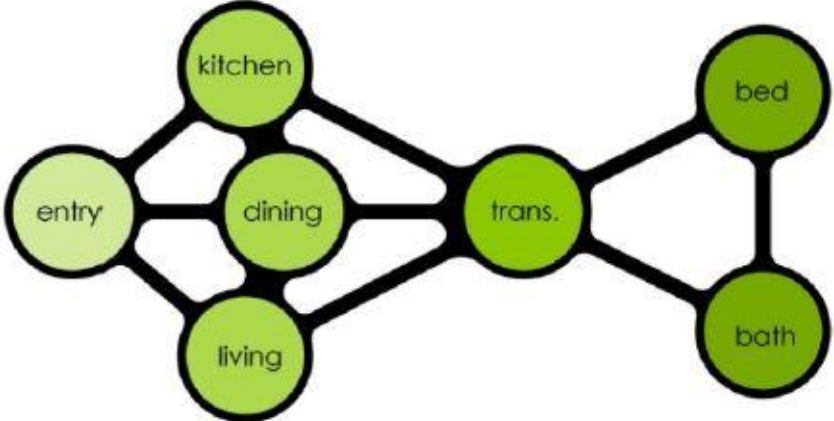
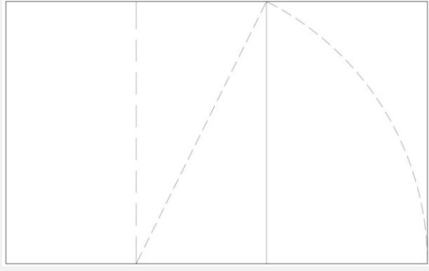
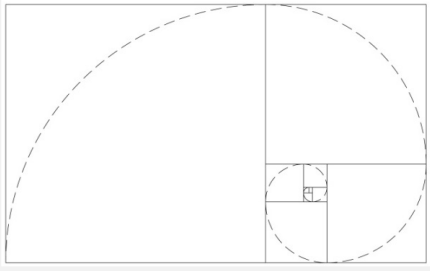
<p>Theory and the name of its founder</p>	<p>Explain the theory</p>	
<p>Probabilistic Functionalism Brunswik's Probabilistic Lens Model Egon Brunswik</p>	<div data-bbox="486 324 1101 795" style="border: 1px solid black; padding: 5px;"> <p>The lens model: Composite picture of the functional unit of behavior</p> <p>Figure no. 5 The lens Model: composite Picture of functional unit of behavior</p> </div> <p>Egon Brunswik Developed this model to look at relationship of humans and the environment as all-are inclusive rather than individual parts. Brunswik is categorized as a functionalist, believing that the environments can explain how humans behave within them.</p>	
<p>Affordances James J. Gibson 1904-1979</p>	<p>James J. Gibson proposed that the environment (such as interiors) can be conceptualized as being made up of substances (e.g., steel, wood, glass) and surfaces (e.g., floors, ceilings, walls). In Gibson’s framework, arrangements of substances and surfaces are called layouts, which provide affordances to perceivers. Affordances are functions of an environment that are instantly detectable as being useful for a particular purpose.</p> <p>One classic affordance is that a flat horizontal expanse in front of a person affords walking. Another might be that a solid, horizontal surface situated about 18 in. (45 cm) off the ground affords sitting. This idea differs from Brunswik’s in that Gibson believed that the environment provides perceivers with an immediate, direct functional assessment of some element, rather than the assessment being processed through a set of cues that are weighted and interpreted. Gibson’s approach has helped to highlight the role of the environment in human perception. One such influence has been on design education programs, which often teach that color, shape, and form are the essential elements. Gibson insisted that everyday perception does not rely on these elements and that designers should not be taught to focus so strongly on form and shape; the emphasis should be on substances and surfaces. This is because, he argued, building users do not pay attention to form and shape parse, but to affordances, which are defined by substances and surfaces.</p>	
<p>Collative Properties Daniel Berlyne 1916-1984</p>	<p>Daniel Berlyne’s approach proposes that environments contain collative properties, which border on the distinction between cognition and perception. Collative properties are attributes of a setting that cause perceivers to compare environmental details and, generally, to stimulate interest in a setting, such as a particular interior. Some examples of a space’s collative properties are novelty (i.e., perceived newness),</p>	

	<p>incongruity (i.e., the sense that something is out of place or does not fit), complexity (i.e., its number of lines or shapes), and being surprising (i.e., unexpected features). Berlyne proposed that collative properties enhance (or do not enhance) one’s aesthetic experience and desire to explore an environment through hedonic tone (i.e., the amount of beauty or pleasure experienced in a setting). Berlyne’s work has motivated designers to create spaces in accordance to certain collative properties. For example, when some designers decided that modern urban forms were too simple in their lines (i.e., lacked complexity), they pioneered more curvy and articulated designs with the hypothesis that this made them more complex and thus greater in hedonic tone.</p>
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Table no.2 Explanation of Theories of Environmental Perception

The Practical and Analysis Project

Functional, aesthetics and psychological standards in designing the internal spaces of the dwelling according to the Environmental Psychology	
<p><i>Connections to Site</i></p>	<div data-bbox="579 869 1264 1200" data-label="Diagram"> </div> <p>Figure no. 6 Transitions in a Site – There should be a transitional space in between the road and the house, to protect the house. The house itself becomes a buffer for a more private backyard</p>
<p><i>Spatial Arrangement “Bubble diagram”</i></p>	<p>In environmental psychology they have identified different levels of privacy for the inhabitants and to control visitors’ interactions within the space. To avoid an uncomfortable flow of circulation in a home, the spaces should be arranged in a sequence that follows a graduation from public to private. Typically, this starts with the most public space, the entry and ends with the most personal and private spaces of bedrooms and bathrooms.</p>

	 <p>Figure no.7 Public to Private Spaces – in a home spaces transition from the most public to more private spaces. From the outdoors an entry shifts users from the outdoors to the indoors. From there more public spaces are accessed, the kitchen, dining and living spaces and their more private areas that house bedrooms and bathrooms. These can be separate rooms connected with transitional spaces or be areas within a larger space with minimal transitions.</p>
<p><i>Psychological considerations depending on Environmental Psychology</i></p>	<p>Environmental psychology expresses how important it is to consider the cultural background of the clients when designing for them. Different cultures have different ways of laying out the sequences of rooms. Creating a home that has highly segmented spaces for a family who are used more open flowing spaces would make the client uncomfortable. This can be a part of their social values as well, relating to levels of privacy. Much of what people desire within their home comes from their past and what the spaces they grew up in were like. This is the focus of a branch of environmental psychology called design psychology. It is important to identify what home symbolizes for the clients. This could range love and family to the need to belong or a physical attribute, the hearth that represents gathering.</p>
<p><i>Aesthetic considerations in design according to environmental psychology</i></p>	<p>Some recommendations that environmental psychology suggests particularly pertaining to shapes. Environmental psychology cautions against using stagnant squares and rectangles in designing, warning that they can leave users in a stationary preoccupied state. Instead the same golden rectangle is recommended as well as looking at more organic shapes.</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="454 1691 885 1960">  </div> <div data-bbox="949 1691 1380 1960">  </div> </div> <p>Figure no. 8 The Golden Rectangle – A golden rectangle is Figure no.9 The Golden Rectangle – continuing the</p>

	<p>created from a square that is divided in half. A diagonal line drawn from the end of the centerline to a corner then becomes the radius for a circle. The location where that line then crosses the horizontal axis where the center of the new circle is located is the boundary of the new rectangle. The ratio for a golden rectangle is approx. 1:1.618...</p>	<p>concept of the golden rectangle, an arc within that initial square will replicate itself to create a spiral. This spiral is found in nature, most notable in the chambered nautilus. It is also a form of a fractal, it was discussed earlier.</p>
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Results

- The study of human behavior within the various internal spaces helps the designer to reach a more appropriate and more humane design, which contributes to improving the quality of the design process as a whole and making the internal space fulfill all human needs, whether functional, psychological or aesthetical.
- By keeping the environmental stimuli at the perfect levels, the designer can control and determine the design stimuli to achieve psychological and physical comfort for the user. Because when there is an imbalance in the levels of environmental stimuli, the human perception of the design stimuli becomes confused and the perceptual process as a whole is disturbed and thus the wrong messages are conveyed to the conscious and unconscious mind. It makes a person feel uncomfortable in the internal space.
- Applying the principles and standards of environmental psychology in making the internal space more appropriate and achieving psychological comfort for the human being within the internal space.

Recommendations

- The researcher recommends studying human behavior within the different functional internal spaces from an environmental psychology perspective, to reach a design methodology to improving the quality of the design process for internal spaces and making the design more humane.

References

1. Alexander, Christopher, Ishikawa, Sara, Silverstein, Murray, Jacobson, Max, Fiksdahl-King, Ingrid, and Angel, Shlomo. *A Pattern Language*. New York: Oxford University; 5th edition, 1977
2. Katelyn PC Hudson- *Holistic Dwelling: integrating biophilic design, environmental psychology, and feng shui*-PhD-School of Architecture-University of Hawai 'i-2013
3. Toby-Some *Place Like Home: Using Design Psychology to Create Ideal Places*. New Jersey: Design Psychology Press-USA -2010

4. Heba-Talla Hamdy-Interior Architectural Elements that Affect Human Psychology and Behavior-The International Conference: Cities' Identity Through Architecture and Arts (CITAA) year-1st Cairo, Egypt in May, 2017
5. Parisa Akbari, Hassan Sattarisarbangholi-ARCHITECTURAL DESIGN BASED ON ENVIRONMENTAL PSYCHOLOGY PERSPECTIVES-The Turkish Online Journal of Design, Art and Communication - TOJDAC July 2016
6. Mirilia Bonnes-Environmental Psychology and Architecture for Health Care Design28th International Public Health Seminar
7. Saad Mohamed-The psychology of concept and its effect on the interior spaces design-Published research- Journal of Techniques-Iraq-Vol.21-Issue5-2008
8. R.Gifford, Linda Steg, and Joseph P. Reser Environmental Psychology-*The IAAP Handbook of Applied Psychology*, First Edition-Published 2011 by Blackwell Publishing Ltd
9. LINDA STEG and JUDITH I. M. DE GROOT – Environmental Psychology an Introduction- edited by Linda Steg, Groningen University, Netherlands, Judith I. M. de Groot, Bournemouth University, Bournemouth. John Wiley & Sons Ltd-2019
10. DAK Kopec- *Environmental Psychology for Design*- Fairchild Books New York- 2006
11. WALID ABDEL MONEIM -Architecture and Human Behavior-Does Design Affect Our Senses-PHD, Architectural Department, Faculty of Engineering, Cairo University
12. SAMUEL D. GOSLING, ROBERT GIFFORD, AND LINDSAY MCCUNN-Environmental Perception and Interior Design-2013
13. Bernhard Wolf- Brunswik's original lens model- University of Landau, Germany-2005
14. <https://dictionary.apa.org/architectural-psychology>
15. <https://www.archdaily.com/936027/psychology-of-space-how-interiors-impact-our-behavior>
16. https://en.wikipedia.org/wiki/Interior_design_psychology
17. <https://www.aia.org/articles/1616-environmental-psychology-building-with-feelin:31>
18. https://link.springer.com/referenceworkentry/10.1007%2F1-4020-4494-1_120
19. <https://www.semanticscholar>