



## THE ROLE OF BEHAVIORAL SCIENCES IN ARCHITECTURAL DESIGNING

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### ABSTRACT

Environmental psychology has proposed several theories in relation to the impression of the surrounding environment on the human and his interaction between the physical environment and the human experiences. Intriguing questions and issues have been raised in this regard and empirical studies have been implemented to realize those theories and issues. On the one hand, the environmental psychology intends to create experimental theories by observing human behaviors in his everyday indigenous setting; on the other hand, the architectural designers utilize those theories. A significant issue with respect to the theories of environmental psychology is the role of the physical context and setting on the human behavior. In a sense, the human behavior can be affected by the ecological forces in such a way that they can limit his accomplishments and achievements regardless of his aims and motives. Accordingly, the human behavior is confined and enclosed by the environmental ecosystem and his behavior makes sense only in the cycle of that context. The present study intends to investigate the role and significance of the behavioral sciences in architectural designing; hence, it explains architectural spaces. Furthermore, it aims to contribute to the quality of designing architectural spaces by using the basic principles. This research calls for a descriptive-analytical method. The instrument used in this study for collecting data are the library materials, related literature and other written documents and research evidences.

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## INTRODUCTION

One of the main reasons for the creation and development of cities, monuments, buildings, urban structures and outdoor spaces is to provide the required location and environment for the current and potential activities of the human beings; these activities include everyday routines such as walking, watching, sleeping, entertaining, eating and other more specific activities. Satisfying and meeting all the needs of humans is not easy. Fulfilling the need to survive, the need for respect, self-esteem and the cognitive demands are the issues that are taken into consideration in designing. Evolutions and developments in behavioral sciences have resulted in numerous outcomes in the profession of designing; one effect of these evolutions was the establishment of ecological psychology as an area of study by Barker *et al.*, (1968). Ecological psychology made remarkable methodological changes in the traditional research approaches in psychology. These methodological changes shift the focus from the experimental study of the person's behavior to the meta-individual study of his behavior in everyday life and society. Barker explains the patterns of behavior with regard to the physical setting and context. Location designers have also used this descriptive

approach. For instance, Haviland (1969) has used the term "activity domain" to describe the distinct units of relationship between behavior and location. In ecological psychology, the term "behavioral location" is used instead of "activity space".

### Behavioral Centers

The created environment, in this paper, refers to an organized location including levels and surfaces of differing qualities. The organization of a location can vary from an individual level and surface to the levels and surfaces which completely surround a person. Although such locations are sometimes designed for the purpose of beauty, they are typically designed for fulfilling certain functions. One of the methods of creating activity opportunities by the designer is his use of activity systems which consist of orbits of behavior (Perin, 1970). Orbits of behavior have specific purposes and they can be distinguished from each other by means of certain actions such as children's plays. Perin proposed the orbit of behavior as a unit for architectural design and analysis. He argued that: "The orbit of behavior is an anthropological ergonomics for understanding people. In order to figure out the required physical and humanistic resources, anthropological

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ergonomics ought to analyze the daily conducts and actions of people on a range of scales from room, house, residential blocks and neighborhood to city.” The theoretical framework underlying the orbits of behavior has been proposed by Roger Barker. The locus or location of behavior is considered to be a consistent combination of activity and location which includes the following components:

- Repeatable and returnable activity or the common pattern of behavior.
- A certain design of the environment or physical environment.
- A compatible relationship between the environment and the activity or a reciprocal relationship.
- A specific period and phase of time.

If the common patterns of behavior are practiced in a certain behavioral center or locus, then, one physical place can be regarded as part of many behavioral centers or locus. Moreover, one current pattern of behavior includes the following different behaviors which might be practiced in parallel:

- ❖ Overt emotional behavior.
- ❖ Resolving and sorting out problems.
- ❖ Major motional activities
- ❖ Interpersonal interaction
- ❖ Change in objects

The combination of the above-mentioned behaviors which forms a current and common patterns realized in the physical environment. The behavioral centers have internal structures. This structure can adjust itself with the internal organization of the physical environment. Due to having different roles, Different people and groups occupy different parts of the behavioral center. For instance, in a classroom, the position of the teacher on the stage in front of the class enhances his control over the current behavioral patterns. Many of the structures of the behavioral center are established and controlled on the basis of the fact that who controls the behavior. Barker (1968) refers to the area which is under the control and authority of a person as the operation domain. Not all behavioral centers have operation domains and not all operation domains are distinguished by architectural environments. In an analysis of a shopping mall, Paul Gump (1971), a psychologist, presented a good example of a behavioral center. Human being resides in an environment where the physical limitations (walls), the distinct internal spaces (corridors) and the objects (foods) are included within it. Human being lives in a system in which he plays a role and the system provides him with the opportunity to act in a store in the mall. The shopping mall includes an array of events and procedures about buying and selling goods. These behaviors regulate and adjust the current pattern of behavior.

Co-construction is a complex concept. The common scheme and pattern for purchasing something includes examining the prices and then selecting the item. The shop window, for example, displays a row of meats for the process of selection. On the one hand, the butcher who works with the meats and prepares them must have easy access to them; on the other hand, the physical environment should not be arranged and organized only for the ease of the user; rather, it should be designed so that it would be appropriate for the interaction among people. Therefore, the displaying window of the shop provides the opportunity for the interaction between the butcher and the customer (seeing, speaking, exchanging

goods). The customer should be able to see the items and choose among them but he can not intrude into the working and preparing environment of him.

### ***Privacy of the Behavioral Centers and Locations***

Bachtell (1979) has presented the following definition for the privacy of the behavioral centers: the privacy of a behavioral center is a limitation in which behavior is located. Wall is considered to be an ideal privacy which prevents entrance and exit. Some qualities such the lack of vision and sound are needed for the realization of privacy. In case the privacy of behavioral centers is unclear and ambiguous, it would be difficult to define it. The problem concerned with the privacy of the behavioral centers arises when the activities which should be distinguished are not distinguished or are distinguished excessively. The environmental problem arises when some aspects of the current pattern need to be distinguished. For example, in the free classes of a school where the visual isolation between the activities is not necessary but the sound isolation is necessary, this problem might arise.

Furthermore, when some people cannot recognize and understand the specific signs which are representative of the privacy a location, problems may again arise. Such problems are more noticeable in multicultural locations where people of differing cultures live in the same location. In these locations, the signs which are recognized by one group may not be identifiable and meaningful by another group. Roger Barker conducted studies on behavioral centers in order to distinguish specific behavior locations from each other. Robert bachtell (1977) has explained this study thoroughly. Internal interactions and external connections are based on the behaviors which depend upon experts’ judges. In any formal or social organization on a range of scales from large to small such as a factory or a house, it is significant to understand the systems of activities, behavioral centers and the degree of establishment, overlap or distinction among the behavioral centers.

### ***Systems of Activity***

Environment consists of a hierarchy of behavioral centers which associate with each other and hence constitute the systems of activity. The systems of activity reflect the motivations, and knowledge (or imaginations) of their peoples towards the world within the area of their interests, competencies and cultural norms. The identification and analysis of the available systems of activity and the designing of new potential systems underlies the ideas for urban design and architecture of view and environment.(Gifford- 2008)

### ***The Analysis of Environmental Links***

The behavioral centers communicate with each other to give form to one aspect of the activity system or to form a wider behavioral center. It is possible to quantify and measure the current and progress of people’s life and the information shared between the behavioral centers. Designing can have a significant effect on the function and efficiency houses, official buildings, shops, building complexes, residential neighborhoods and the city (Kantowitz & Sorkin, 1983). Most architects of the new movement believe that within a building the interference between the movement routes and the length of the commuting routes should be minimized.This

view is considered to be a part of the performance-oriented concept.

It is now believed that the efficiency of movement is not the only objective of planning and it is not considered as the only criterion for the assessment of quality. Crossing paths may fulfill positive purposes such as the communication and meeting of people with each other, social interaction and an enhancement in the sense of safety, attachment and closeness. On the other hand, the lack of efficiency and accessibility might cause harmful impacts on the performance of an organization or an institute. As a result, it should be pointed out that, at the phase of understanding the process of designing, the designer is obliged to examine and investigate the efficiency of movement, the workflow and performance of the organization as a significant factor and objective; then, having compared this factor with the other factors and objectives, he should make his plan and design.

### ***The Impact of Behavioral Centers on Human Behavior***

As it was mentioned earlier, the structures and patterns of a physical environment lead to the establishment of specific behaviors and the impressions which are made on a specific citizen or a group are the function of a complex array of factors such as earlier predilections, competences and abilities and the efficiency and the cost of any behavior. In general, it might be discussed that the behavioral centers are more compulsory and mandatory than the common patterns of behavior or the physical environment. Barker has presented contradictory views and theories on the effect of physical environment on human behavior. On the one hand, he claims that "an antisocial ecological environment does not demand and require any behavior." On the other hand, the concept of physiognomy and the analysis of facial features acknowledge the Gestalt psychology.

Accepting this position denotes that the physical environment is characterized by a feature which demands and calls for specific qualities and patterns. Barker contends that a big outdoor area stimulates and provokes a sense of running in the child. This view reveals that Barker's arguments and thoughts have been influenced and impressed by Kurt Lewin's (1936, 1951) theory. Social and socialization issues are enormously mandatory and obligatory. The teachers, legal and official systems and the cultural norms all move towards conformity and compliance. People understand that in a particular environment they should show a particular behavior. People select a behavioral center since they have the ability to adapt themselves with the common patterns of behavior. If the common patterns of behavior have the capability to serve as a tool for fulfilling their purposes, people will show adaptability and will conform themselves with those patterns. Some behavioral centers, especially those in the form of established organizations and institutions have certain relations for membership and in case the members do not conform to those relations, they will be dismissed from that organization. (Lang, J-1987)

### ***The Concept of Fitness***

The concepts of fitness, capability, homogeneity and adaptability serve as means for indicating the relationship between the behavioral patterns and the patterns of the physical context. These terms are used to illustrate qualitative relationships between the behaviors and the context. Indeed,

particular physical contexts are more appropriate and capable of providing and supplying certain behaviors and they fit those behaviors very well better than other physical environments. In other words, there is a high degree of homogeneity and adaptability between the people's activities and the physical environment. (Matlabi-2001)

### ***Behavioral Locations and Behavior***

A behavioral location such as a square of a town can be split into a number of smaller behavioral places. The liveliness of such places depends on the behaviors which each small location can supply and provide. Social and humanistic venues are places where there is room for comfortable seating, enough light, the opportunity for people to meet one another, and opportunity for performance and work such as deli kiosks. Outdoor environments which lack such facilities have changed into lifeless places (Lennard & Lennard 1983, Whyte 1975). There is a mutual relationship between a person and the behavioral system so that the person has a role in the behavioral system and makes use of the advantages of that place.

### ***Adaptability and Flexibility***

With the exception of very rare cases, the majority of common behavioral patterns are realized and performed in a specific physical context and location. For instance, in case a room is well-lit, it can be considered as appropriate for the realization and fulfillment of activities and purposes. Furthermore, if a room is equipped with furniture, it can be used for the realization of specific tasks and activities rather than other tasks and activities (Barker contends that such a room is said to have acquired an internal structure). Some places are designed for a specific purpose, hence, they cannot fulfill other functions and tasks. If the social norms do not prevent it, even a restroom or a bathroom might be used by children for water playing.

Edward T Hall (1966) has developed three kind of spatial organization. These spatial organizations include the space with a fixed feature, space with semi-fixed feature and a formless space. A fixed-feature location is characterized by immovable components such as fixed walls, floors, windows and fittings. A location with a semi-fixed feature refers to the one where the furniture can be moved. Finally, a formless location is created by means of the interpersonal relationships; the latter kinds of environments are invisible and they are beyond the consciousness and awareness of people.

### ***Behavioral Centers and Designing***

There are fundamental alphabets and principles for the classification and categorization of buildings and architectural spaces. When it is mentioned that a building is a school, church or an official building, people assume the physical features and the behavioral patterns which are typical of that place. These assumptions and images of a certain location with certain patterns of behavior are formed on the basis of the people's experiences. On the other hand, the designers rely on their own imaginations. However, it should be noted that there is a difference between our assumed and imagined patterns and the real patterns.

### ***Individual Differences and Systems of Activity***

During the past years, lots of efforts have been made to explain the systems of activity as the basis of planning and

designing. The conducted studies have led to the understanding of significant criteria and issues with regard to planning. These studies focused on people's activities in certain locations such as public outdoor locations and zoomed in on specific cycles and periods in people's life, namely the young and the elderly. Moreover, similar attempts have been made to explain the nature and features of activity patterns in special locations. Thus, it might be argued that differing human needs in different locations were taken into consideration to explain the basic principles of the systems of activity. (Gifford- 2007a)

### ***Environment and lifestyles***

Although it might be claimed that one kind of residential environment can accommodate and respond to all the different lifestyles, it must be acknowledged that certain lifestyles are more compatible and appropriate with special models and patterns of housing. For instance, houses which are located in rows and face one another allow for easy access of people with each other and they help maintain the family ties and relationships and extend family horizons. However, this lifestyle can be realized and fulfilled in dense high-rise housings. Indeed, such high-rise housing complexes protect privacy very well. Moreover, suburban types of housing are appropriate for the home-oriented lifestyle of most nuclear families; however, they are not appropriate for the group-oriented behavior of the teenagers and the elderly. (Gifford-2008).

The compatibility and adaptability of the physical context with the behavior depend on the degree of people's competence and their limb features. Inasmuch as the majority of people's activities include scientific behaviors, hence, the physical context should be compatible with the capabilities of the people. The anthropological studies (the science of the study of the different aspects and sizes of human bodies) and agronomical studies (the engineering of human variables) are conducted in response to these needs. These research studies and the theoretical applications of them will be discussed in the next subsection. Rather than explaining how different features of human limbs lead to the establishment of activity systems, these studies have focused on the functionality and usefulness of the constructions and buildings for human needs. (Gifford- 2007a)

As the people develop more and their competencies become better, their use of the environment becomes more extended. In case of people's competences decline due to their age or disease, the physical limitation will increase. Then, there must be a high correlation between the different biological periods, physiological capabilities and activity systems of people. On the other hand, different activities such as growing up, becoming independent and rearing children can signify and distinguish among different periods of human life (Michelson, 1979). Different patterns in urban and suburban environments, amusement and entertainment locations, urban institutes, commercial centers provide different kinds of experiences and physiological capabilities for the different periods of human life.

### ***The Structure of House and Culture***

Small locations which constitute the behavioral locations might fulfill similar functions in different cultures. However, the characteristics of each location and the relationships

between them might be different. The three proposed examples are from India. The plans and designs are different depending on the role of gender and the separation of gender, the role of servants, kids and cooking and washing. Whereas the house with a central yard indicates a traditional form, the patterns of a modern house or apartment are different. The life styles and ways of living can be recognized and understood by the roles of people and behavioral centers. Different local and urban lifestyles distinguish the functions and applications of urban designs. The following factors should be taken into account in designing and setting the functions of a house: the activities which will be conducted in the house, the manner of interaction between people, the amount and level of household activities and family organization. (Bahrain- 2001)

Family organization and structure is considered to be one of the significant factors in designing the neighborhood of the house and its internal design. According to the definitions, the nuclear and extended families are distinct from each other. The extended families have been divided into three types: horizontal extended families, vertical extended families and both of them. In horizontal extended families, the family members from the same generation live together; hence, when the family members meet and get together in different occasions, the physical features within the house should be fitting and adaptable with them. In vertical extended families, three generations live together and the sleeping environments of the house are regarded as more important. (Bahrain- 2001)

The geographical features of the environment such as climate and topography of the ground have an effect on the distribution and formation of the behavioral centers. There is a relationship between culture and climate. Lifestyles, the ways of using house, building and outdoor environments and the type of activities (especially entertaining activities) indicate the natural and geographical features of an area; however, establishing such a relationship should not be regarded as general and exhaustive. In many cases, the geographical and natural conditions of an area are capable of providing activities which are unusual and atypical in that culture of that area. In any case, there is a strong relationship between people's activity patterns and the natural features of their living environment. (Bahrain- 2001)

## **CONCLUSION**

Designers consider those aspects of the physical environments and locations which are related to the designing of spaces and rooms. The practice of designing refers to the physical configuration of the environment and the geometrical analysis of the environment. Recognition of the geometrical features as the basis of design is significant. At the same time, the expected quality of an environment is provided through geometry. If we consider the environment as a set of behavioral centers, we should notice the internal relationship between the common patterns of behavior and the environment. Conducting research on behavioral sciences makes it possible for environmental designers and their employers to understand the available patterns of behavior and the required patterns for special conditions. The analysis of behavioral centers provides the opportunity for a richer understanding of the human behavior. Such studies and analyses provide information about the individual and group

differences with regard to the patterns of behavior which can free designers from stereotypical imaginations.

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