Research Paper

The Concept of Behavioral Setting and its Impact on Improving Environmental Quality Neighborhood Parks (Case Study: Shiraz SEKONJ Neighborhood Park)

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Abstract
Neighborhood parks are important as spaces of residential neighborhoods where part of the daily interactions of residents take place. Hence, the study of the environmental quality of the behavioral settings in which they are formed can be considered a suitable indicator to measure environmental quality with behavioral patterns. In order to intervene or adopt strategies in the design and planning of neighborhood parks, behavioral settings offer appropriate indicators. The present study has a combined strategy (qualitative and case study) with an analytical-descriptive approach. The paper evaluates the quality of behavioral settings in a selected neighborhood park (SEKONJ of Shiraz) in three steps. In the first step, the basics and conceptual framework are discussed and in the next step, two components, namely physical (welfare, recreational facilities, and site features) and social (social interactions) are introduced to measure the quality of the setting in neighborhood parks. In the third step of the research, two tactics of semi-structured interview (40 participants) and behavioral mapping (using filming and observation techniques) are used together to collect data. In addition, in this stage using the components expressed in the second step, the quality of behavioral settings in the selected neighborhood park is analyzed. The results of the findings indicate that there is some synomorphy between the behavioral pattern of "recreation" and the physical environment, but the behavioral pattern of "children's play" is not consistent with the physical milieu. Finally, planning and design guidelines and strategies to improve the environmental quality of neighborhood parks are proposed.

Keywords: Behavioral setting, Synomorphy, Behavioral maps, Residential neighborhoods, Neighborhood park.

1. INTRODUCTION

As one of the key public spaces of residential neighborhoods, neighborhood parks are considered among the areas in which a significant part of daily interactions of residents is formed. In other words, neighborhood parks are always interactive places that allow diverse and continuous activities for neighborhood residents of different age groups (Yuen, 1996). Neighborhood parks are important in terms of physical, social, and behavioral conditions due to the fact that they allow residents to interact with one another. Therefore, the activity of parks in the neighborhood and also improving their environmental quality, according to the proposed dimensions, can

enhance the welfare of residents and quality of life in residential neighborhoods.

Adoption of any policy governing planning and design in the public realm such as neighborhood parks should be in direct connection and with due regard to the correct perception of users' behavior. From this perspective, considering that behavioral setting theory explicitly examines the relationship between the environment and people's behavior, it can provide a good basis for intervention and improvement of environmental quality. Behavioral setting measures the direct effect of the environment on users' behavior (Perkins et al, 1988). In the behavioral setting, the level of presence and interaction of the residents is taken into

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consideration by matching the behavior patterns of the users and the environment.

The problem of behavioral setting, which has given rise to studies for "designing the environment" and "modifying the pattern of behavior" of users, is important owing to its applicability to solve environmental problems (Popov & Compolov, 2012). Environmental quality can be improved by changing user behavior patterns (Soen, 1974). Similarly, Lang (2005) considers the study of the quality of public realms as behavioral settings to be important and noteworthy, because "people's sense of place" is also measured. At the same time, the quality of the environment must be evaluated and the psychological impact that the design has on users must be anticipated (Heft, 2012).

This research focuses on the significance of behavioral settings and the indicators that shape settings in neighborhood parks, given the importance of these public realms at the neighborhood level. Also, the perception of users in the formation of behavioral setting has been analyzed. The challenge that this research faced with the concept of behavioral setting was that the environment and behavioral patterns of the users in the case study are synomorphical with each other. In response to this matter and to accurately analyze the case study, findings were taken from the behavioral maps and the semi-structured interview technique. Based on the findings, the strategies for improving environmental quality in neighborhood parks have been explained, which can be considered one of the main reasons to conduct this study.

The purpose of studying the concept of behavioral setting in neighborhood parks is to achieve appropriate strategies for planning and design to improve the quality of residential neighborhoods. In line with this goal, three general questions can be considered in this study: a) What are the indicators that shape the behavioral setting in neighborhood parks? b) From the citizens' evaluative point of view and the analyses carried out in the selected neighborhood park, are the patterns of behavior and environment synomorphical? And c) What can be the appropriate policies and strategies for designing and planning neighborhood parks according to the concept of behavioral setting in order to improve the environmental quality?

2. THEORETICAL FOUNDATIONS

The concept of behavioral setting was introduced along with the theory of ecological psychology, which includes a specific range of environmental and behavioral characteristics addressing aspects of daily life and part of it. (Ittelson, 1989). The concept of behavioral setting was first introduced and studied by Barker and Wright (1947-1972) (Wicker, 2011). One of their goals in defining the concept of behavioral setting was to examine whether individuals' behavior is "systematically and functionally" related to the environment. In his research, Barker examined the behavior patterns of children and concluded that their behavior in different behavioral settings had significant differences, and their behavioral pattern has commonalities. Barker states that by being aware of the behavioral characteristics of users in the behavioral base they use, some behavioral aspects can be predicted (Heft, 2012).

In Barker's studies, some characteristics of children's behavior can be analyzed and "predicted" by "recognizing" the characteristics that occur in the behavioral environment (Krasner, 1980). Barker considers the behavioral setting to consist of stable behavioral patterns. These patterns are, in effect, formed in behavioral environments and the same structure in terms of behavior can be observed in the environment. (Popov & Compolov, 2012). Barker points out that behavioral setting is a place where most residents can meet their personal motivations, and where they can get a lot of satisfaction. In other words, a behavioral setting includes opportunities. In addition, different people achieve different clusters of satisfaction in the same environment. The unity of a behavioral setting does not stem from similarities in user motivation. (Fox, 1985, p. 187).

The behavioral setting is defined with functional indicators; behavioral setting is a function of the "social system" that includes the activities of individuals in a particular physical environment (Kaminski, 1989). The setting is a small-scale social system that is both physically and temporally limited. Behavioral settings are made up of people (actors) as well as inanimate objects that people interact with (behavioral episodes). Inside the setting, the program of the setting takes place. This program is a sequence of interactions between the individual and the environment (behavioral episodes) that form the basic function of the setting (Luke et al, 2002, p. 218).

Behavioral setting bases are social structures that arise from the interactions of residents and are therefore influenced by specific goals, especially their founders. The setting is related not only to individuals and the behavior within them but also to other settings and the socio-physical environment conditions of their larger context (Wicker, 2002, p. 118).

Swap (1978) points out that the behavioral setting is the physical milieu that shapes users' activities according to time and place. Activities that lead to specific behaviors in the environment occur under the influence of "expectations" and user preferences. The physical environment is crucial in determining

behavioral patterns. Gump (1971) also introduces three factors in the formation of behavioral settings; a) "Non-behavioral" factors such as "time and environment"; b) "permanent and repetitive patterns of behavior" and c) the relationship between the two previous factors. In the third factor, in addition to "time and environment", which have been mentioned as limiting factors of "behavior pattern", "synomorphy" has been introduced as the most important aspect of communication because synomorphy describes the "fit" between "behavior" and "physical milieu".

Behavioral setting on a continuous basis is constantly being "reconstructed" and "rebuilt," and in fact, this indicates that changes are moving in the direction of "sustainability" of the environment. This issue can be cited as long as the behavioral setting acts in line with user behavior. Otherwise, the changes take place in a fundamental way (Wicker, 2002). Wicker (2011) examines the behavioral setting from two perspectives: a) The traditional view in which the behavioral setting is a self-regulatory system and in addition to providing a platform for behavior, it restricts user behavior, and b) The contemporary view where the behavioral setting is based on "individual and group feelings". In this view, users of space behave according to their "knowledge" and "belief" in the behavior environment and "social processes" and "cognition" are examined in the behavioral context. However, Wicker's own approach, which can be placed in the third category, is a combination of traditional and contemporary perspectives, which are two approaches to enhancing the behavioral setting experience.

The behavioral setting has a power that can have a positive effect on the people living in it. Other important features of the setting can be referred to as "specific behavioral patterns" that mostly drive the "program" of the setting or "active participation" of users that affect the "permanent behavior patterns". Yet, other notable features can be referred to as "inanimate objects" in the behavioral environment, which could be a sign of an environmental character and a reference to the behavior of users in the behavioral environment (Perkins & Baker, 1991). The behavioral setting, according to Scott (2005), has four basic characteristics that emphasize its "power": a) the source that considers the behavioral setting as an "extra-individual" and objective phenomenon, b) the interdependence that exists between behavior and physique, c) "the self-regulating" feature that is based on the goals of the behavioral setting (the factors within the setting will achieve some degree of communication and balance between each other), and d) user behavior that both influence and are influenced by the environment.

The behavioral setting is important in that it examines the extent of the "direct impact" of the environment on the behavior of those who occupy it (Perkins et al, 1988). When one is placed in a behavioral setting, they have to follow the behavioral pattern used by the group (Heft, 2012). Behavioral settings can be viewed on a small scale because people's behavior is controlled in small environments. In addition, changes in the smallest features of the behavioral setting lead to the creation of a new behavioral setting (Bernasco et al., 2013). Examining the concept of behavioral setting provides the possibility of "perception" and "behavior change" that, if behavioral patterns can be evaluated based on similarities, can be used to make appropriate interventions in the environment (Curtis et al., 2019). It is the stable and reciprocal behavior between individuals that creates character and meaning for the behavioral setting according to its environmental capabilities and affordability (Heft et al., 2014). Wicker (2002) states that behavioral setting can be examined in terms of a "psychological process". This means that the "internal dynamics" between the constituent characteristics of the behavioral setting can be considered in terms of the factors that lead to the creation of "sense" in the behavioral setting.

The physical milieu includes behavior patterns that occur repeatedly or in particular (events) in the environment. What will happen in the behavioral environment is highly dependent on indicators such as the "predispositions, motivation, knowledge, and competence" of the users who participate in that environment (Lang, 2005). Behavioral setting analysis should examine both physical and social characteristics in the environment (Scott, 2005). The indicators of each behavioral setting are different and are in fact based on goals and activities specific to the behavioral environment pursued by individuals (Popov & Compolov, 2012). In fact, as Wicker (2012) points out, the indicators that form a behavioral setting are a reflection of the context in which users are located. Behavioral setting acts in the direction of users' goals and eliminates any disruption in that regard (Wicker, 2002).

To summarize the theoretical framework of the behavioral setting, the characteristics of the behavioral setting can be explained in a model (Figure 1). Behavioral settings are an interconnected and structured cycle that has clear temporal and spatial boundaries. Moreover, the contextual conditions (such as economy, culture, and society as a larger context) in which the settings are located define the structure of the behavioral settings. Behavioral setting includes permanent behavioral patterns that are obtained from

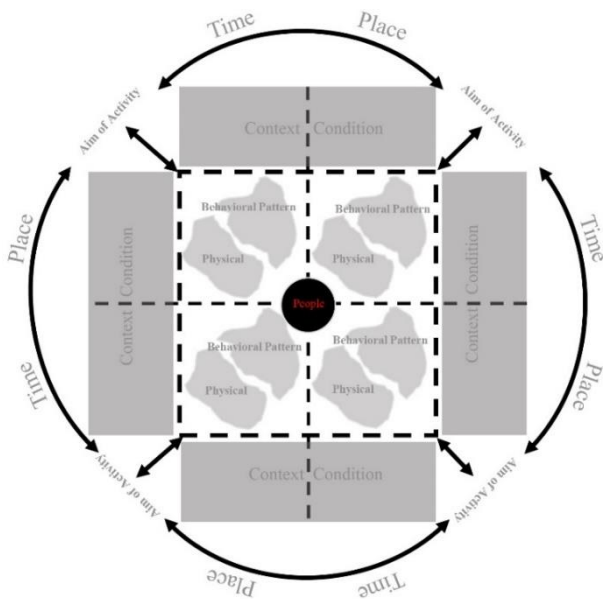the communication and interaction of individuals with the behavioral environment.

Fig 1. The Conceptual Model of Behavioral Setting Based on Theoretical Concepts (Source: Authors)

2.1. Review of the Literature

Various and numerous studies have been conducted on behavioral settings since the introduction of this concept into environmental psychology. Referring to them can help define indicators, effect of behavioral patterns, and the characteristics of the behavioral milieu on the formation of setting. Among the studies that have dealt with the concept of behavioral setting, we can mention the research of Sanoff and Coates (1971). The researchers have examined the relationship between "children's play behavior" with the pre-programmed physical characteristics of the residential environment in Ridgefield, New Jersey. They point out that appropriate site planning allows for the formation of a "diverse setting" for children's behaviors. In this study, Sanoff and Coates have turned their observations of activities into behavioral maps in a specific period of time according to the amount of activity in the place. Indicators such as Characteristic action patterns, behavioral and physical mechanisms, and size characteristics are also mentioned in the proposed behavioral maps.

Moore (1987), in his study of "child care centers", also notes that behavioral setting increases the degree of "participation" of individuals in "activities". Cosco et al. (2010) also examined and compared the physical activity of children aged three to five in two care centers. The scholars point out that the level of

physical activity of children in the behavioral setting studied varies according to the structure of the paths as well as the type of materials used in the floor of the behavioral areas.

Other important studies have examined the relationship between crime and delinquency in the setting. In this regard, we can refer to the research of Caplan et al. (2017) where the researchers studied the creation of crime-related behavioral settings in Glendale, Arizona. The findings indicate that some behavioral settings are effective in increasing crime rates. In other words, in behavioral settings or places close to them, we see more criminality in the case study. Bernasco et al. (2013) also assessed adolescent delinquency in relation to the behavioral setting. The results of the research report a significant relationship between "setting diversity" and delinquency, indicating that crime is affected by the "content of setting". In another study by Hart and Miethe (2015) examining crime-related crime rates in Henderson, Nevada, the researchers point out that crime occurs less frequently in behavioral setting. The findings also indicate significant differences between the "structure" of behavioral setting in terms of quality and criminality.

Different studies have been done both in terms of scale and in terms of how behavior settings are studied, all pointing to the importance of behavior setting. Heft et al.'s (2014) study on the "identity" and "meaning" of users perceived from the setting according to behavioral patterns is a notable example. In this study, in order to evaluate the individual's perception of the setting, several experiments were performed with the help of "computer animations" prepared from "daily activities" in the behavioral setting. The results indicate that due to the common behavioral patterns that result from the interaction and collective relationship between users, the "identity" and "meaning" of the behavior setting can be understood. Frater and Kingham (2020) also compare two groups of adolescents. One group is adolescents who were born in New Zealand and immigrated to the Netherlands, and the other group is those who have lived in New Zealand. In this comparison, the behavior and environmental perception of these two groups regarding the cycling route to school are examined. The findings indicate that there is a significant difference between the two groups, which results from different perceptions of the environment and "intrapersonal" factors that occur in the behavioral setting.

Among the studies conducted by Iranian researchers, we can mention the studies of Zolfigol and Karimi Moshaver (2019), in the study, the researchers examined the behavioral site in the Tomb

of Bu Ali Sina in Hamadan. The results of this study indicate that the component of "social interactions" and "gathering" from the perceptual perspective of citizens in the formation of behavioral settings has been prioritized. Also, the activities of the citizens, especially their social activities close to the square, have taken up more time. In another study, Sarbandi Farahani et al. (2014) analyzed the factors affecting the environmental quality of behavioral settings in open and green spaces of the neighborhood. The researchers point out that components such as "physical and visual permeability", "activity diversity", "security" and "environmental comfort" are all effective and important in improving the environmental quality of the behavioral setting.

Soleimani et al. (2018), in their research, have studied the behavioral setting on Imam Street in Urmia. The results report that there is a relationship between the behavior of citizens in the mentioned behavioral setting and the physical environment. The physical environment has been cited as a predictor of positive citizen behavior. It should also be noted that in the evaluation, the behavioral environment examined is not physically appropriate for the behavior of citizens. Hamedani Golshan et al. (2020), using the concept of behavioral setting and space syntax technique, also analyzed "Movement behavior patterns" in residential areas of selected neighborhoods of Tehran. The results of this study indicate that there is a direct relationship between "behavioral pattern" and the structure of open spaces of the studied residential environments, and also note that the open spaces in the "distribution" behavioral setting are effective in residential neighborhoods.

Other studies in the field of behavioral setting include research conducted in educational environments or related places. In another study, Beyraghi and Balilan Asl (2018) examined and compared the "components" of the behavioral setting in the "Faculty of Islamic Art of Tabriz" and "Islamic Azad University of Tabriz". The researchers point out that the level of "spatial desirability" and its relationship with the components of the behavioral setting in the Faculty of Islamic Art of Tabriz, which is located in the space of traditional houses, is higher. Hamzenejad and Ghelichy (2019) have analyzed the quality of the behavioral setting and the concept of "sociability" in the Park of Iran University of Science and Technology. In this evaluation, indicators such as "fixed furniture" and "presence of water" have been emphasized as factors in the socialization of space and shaping the behavioral setting from the perspective of users.

Jafari et al. (2020) have studied the behavioral setting in the dormitory of female students of Shiraz University. Findings in this study indicate that the physical dimensions of the dormitory are not appropriate to the behavioral pattern of students and therefore, dormitory design strategies based on the behavioral pattern of students in three scales "private space", "semi-private" and "public" are presented. Ahmadi and Farhady (2017) have also studied the field of individual work of students as a behavioral setting in architectural design workshops. The results indicate that students' work areas along with collective areas - if the definition is appropriate and in accordance with the psychological needs of students - can lead to a sense of belonging and increase the function of the educational space.

As can be seen from the research background, most of the studies conducted examined the behavioral setting in areas that form a limited section in terms of impact on the daily life of the people of the community. In this regard, the study of neighborhood parks as behavioral settings that affect the lives of residents in residential neighborhoods both socially and physically can be important and thought-provoking. It seems that, according to the studies conducted, in order to achieve appropriate strategies and policies in the design of neighborhood parks, fewer studies can be found that examined the quality of behavioral setting in neighborhood parks.

2.1.1. Components of Neighborhood Parks

In order to be able to make a proper analysis of the quality of the behavioral setting, components and criteria from neighborhood parks are needed to examine and evaluate the quality of the behavioral setting created in it. Based on the studies conducted on neighborhood parks, these components can be divided into two categories: "physical" and "social";

2.1.1.1. Physical Components

• **Welfare facilities:** Among the welfare facilities that neighborhood parks should have, it is possible to consider a suitable area for sitting and its correct location, the existence of picnic tables, toilets, and drinking water springs, flexible spaces to adapt to the needs in the length of time, and a space for pets to walk. (Marcus and Francis, 2015; Jenkins et al., 2015; Hughey et al., 2016; Shaftoe, 2008).

• **Walking and cycling path:** For cycling and skating, separate loops should be used to prevent the walking and cycling paths from intersecting one another. Also, pedestrian paths must have "proper visibility directions" and "legibility". The floor of the

paths must be non-slippery (Marcus and Francis, 2015).

- **Children's play space:** Children's play space should attract children, allow for children's mobility and meet the needs of play at different ages. The space provided for children with mobility limitations should also create a place of activity (Jenkins et al., 2015). Shaftoe (2008) considers a suitable place for children to play in public spaces to have two characteristics: a) a suitable space around the children's play area for sitting, and picnic tables that allow parents to monitor, and b) use of elements that allow for more creativity in children's play space. In addition, to prevent children from being harmed while playing, elastic materials should be used on the floor and the playground should be located in such a way that the noise and congestion of activities do not disturb the relaxing atmosphere of the park (Marcus and Francis, 2015).

- **Site Features:** Features such as topography, landscaping, distinctive characters in landscaping and artistic and historical features (focal points that attract people), appropriate lighting in the park, the shade of trees that make the close planting of trees satisfactory, good access to the environment, relaxing areas that create privacy for users and the element of water, which in addition to creating a visual presence, creates a sense of calm, can often be considered as quality features of the park (Gold, 1972; Nurhayati et al., 2011; Shaftoe, 2008; Hughey et al., 2016 & Whyte, 2013).

2.1.1.2. Social Components

A neighborhood park is successful when it provides a suitable environment for the diverse activities of residents of different ages. Neighborhood parks have both a "symbolic and a social" interpretation for users (Yuen, 1996). One of the reasons parks are used is the existence of a "familiar and comfortable social field" (Gold, 1972) in which "diverse activities" and "social interaction" take place (Yuen, 1996). Residents of the neighborhood interact with one another by going to the park, talking, eating with each other, and even through the conversations that take place around the children's playground while their children are playing (Marcus and Francis, 2015). Moulay et al. (2017) consider legibility as a factor in promoting social interactions and argue that components such as transparent structure (e.g. recognizable park activities from the outside, park location, easy use of sidewalks, lack of visual barriers, and adequate access to the park), proportional distances between the range of activities, visibility, and seating arrangement are effective in promoting social interactions in parks. Increasing the legibility of

neighborhood parks will increase "interaction between residents" as well as "social value" (Moulay et al., 2017).

Promoting social interaction in parks will increase informal monitoring as well as the environmental security that users enjoy. In line with the issues raised, neighborhood parks should provide a suitable context for the occurrence of various activities, events, and socialization of residents. As mentioned in the criteria for measuring the quality of neighborhood parks, it can be stated that - based on the activities formed in neighborhood parks, the amount of physical (recreational, welfare and site features) and social (social interactions) components and their quality - the more behavioral patterns there are, the higher the quality of the behavioral setting being analyzed. Also, in measuring the quality of behavioral settings, it should be noted that this quality in neighborhood parks is affected by the conditions of their "larger context"; that is, "socio-cultural" and "socio-economic" forces.
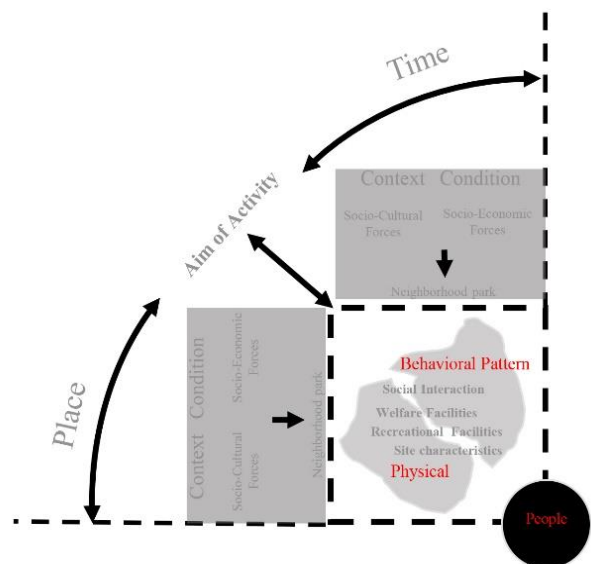

Fig 2. Conceptual Model of Behavioral Setting and its Adaptation to the Quality Components of Neighborhood Parks (Source: Authors)

3. METHODOLOGY

The strategy of the present study is a combination of a qualitative strategy and a case study strategy with an analytical-descriptive approach. The data collection and analysis of this manuscript have been done in three parts (Figure 3). The first part has used information sources to map the theoretical and conceptual framework and in the second part components to measure the quality of behavioral settings in neighborhood parks have been explained.

In addition, in the third part, in order to review the case study, two tactics, namely interview and behavioral maps, are used as a complement to each other. Finally, with the accompaniment of the mentioned components (second stage) and the data obtained from the case study, behavioral setting quality is analyzed, followed by guidelines and strategies in designing and planning neighborhood parks.

In the description of tactics, it should be mentioned that there were 40 interviews (the interviews continued until the authors reached theoretical saturation), in the form of semi-structured in-depth interviews with the participants (10 minutes on average per interview) in the case study. This is because interviews have the potential to provide an appropriate perception of the environment by the audience. Interviewing can examine "motivation" and "complex behavioral conditions" as a complementary tactic and transfer appropriate information about the "context of behavior" and "environmental interactions" (Seamon & Gill, 2018). It should be noted that in the interviews, attempts were made to use neighborhood residents (randomly) as "potential participants" who use the park in question on a daily basis. The data from the interview were used in the method of Content analysis, coding (open coding), and along with behavioral maps.

In the case of behavioral maps, it should be noted first that this tactic has been used in several studies to analyze behavioral sites, which can be described in terms of its comparative advantages by researchers. As stated by Gehl & Svarre (2013), behavioral maps can be used to better understand the behavior and activities of individuals in relation to the physical milieu. Behavioral maps for small-scale places can be a good approach. Behavioral maps refer to the "number, type of activities, and places" in which activities take place, and capture user behavior in the environment over a specified period of time (Gehl & Svarre, 2013). In general, behavioral maps are a good way to examine the relationship between "components" as well as "environmental affordance" in the behavioral setting. Such maps provide information that can be used to improve quality (Cosco et al., 2010). It should be noted that in order to create behavioral maps, filming techniques (the highest point in the park was selected to better observe the behavior), and direct observation were used.

In selecting the case of study, it should be noted that at first, Mellat, Farhang, Golha, Sajjadieh, and SEKONJ parks were selected in District 6 of Shiraz, but after studies, each of them was set aside for the reasons mentioned, and finally, SEKONJ was chosen as a suitable case of study for analysis according to the subject. Mellat and Farhang Park were excluded due to the fact that they are located next to the neighborhood texture, but are mostly used by non-local people. In addition, Golha Park could not be analyzed due to the criminal behavior of users (youth and adolescent delinquents) to assess the quality of the behavioral setting. Another park called Sajjadieh did not include any special features in terms of design and physical planning in order to measure the pattern of behavior and physique.

District 6, according to a report released by the Shiraz municipality office on the needs assessment of residents' access to public park services (2018), and given the population of the region, District 6 (125,183) is one of the less privileged regions in terms of benefiting from neighborhood parks (Figure 4). SEKONJ Park as the selected park is among the parks designed on a neighborhood scale and has been built by the regeneration of abandoned space in the neighborhood. This park enjoys special design and spatial planning features. After an expert panel was formed, the park was approved to be analyzed and evaluated in terms of the quality of the behavioral setting. It should be noted that the most appropriate time to collect data and review activities is in the evening from 18 to 21 due to the climatic conditions of Shiraz (in summer) and the presence of people as well as the weekends due to more visits by residents to SEKONJ park. Data collection was done at SEKONJ over a period of one month (mid-June to July 2022).
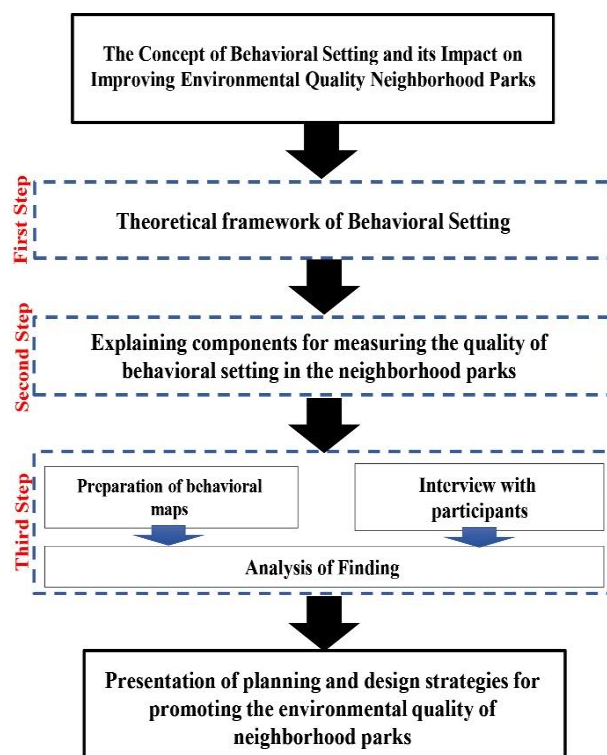

Fig 3. Research Process (Source: Authors)

**Fig 4**. Location of SEKONJ in the Neighborhood

4. FINDINGS

4.1 . Interview Content Analysis

As mentioned in the research method, 40 interviews were conducted with "potential participants" in the SEKONJ neighborhood park, of which 47% were male participants and 53% were female. It should also be noted that the highest age frequency of participants is between 40 and 50 with 40% and the lowest is under 20 years with 7%, (23% of participants are over 50 years old, 20% are between 30 and 49 and the other 10% are between 20 and 29 years old). It is worth mentioning that the frequency of visiting participants from SEKONJ Park is the same (27%) every other day and every week and 23% of them also visit the park every day and every month (according to some interviewees, their attendance has decreased due to the prevalence of Covid-19 disease). In terms of the level of education of the participants, the highest frequency is the level of bachelor's education (40%).

In the first question, the participants were asked about the reasons why they visited the park. Three main activities were mentioned in response (Graph 1): a) recreation and spending time: most of them considered the SEKONJ park a suitable space for gatherings, friendly appointments, meeting neighbors, as well as recreation with other family members, b) Children's play: (cycling and skating on the playground), in which parents took their kids to the park to play (parents mainly pointed out that due to its proximity to the place of residence and the appropriate

social space; SEKONJ Park has been chosen for their children's playtime and entertainment in comparison with the parks nearby). Also, in the interviews and observations (reviewed on several different days), it was recognizable that the hours and even days of parents' presence for their children to play were predetermined and a kind of social interaction between parents was formed along with play activities, and c) walking in SEKONJ Park is also one of the activities that the participants mentioned because of their visit.

In another question, the activities that the interviewees are interested in doing but cannot do in the park (expectation from the environment) along with the park defect were evaluated from their point of view (Graphs 2 and 3). This question can refer to the extent to which the activities that users want to do in a neighborhood park conform to the design and planning. Among the interviewees, 62% considered the space intended for the park to be consistent with the activity they were doing in the park. However, others did not introduce the activity that they could not do in SEKONJ Park in their evaluations. In the analysis of this matter, it can perhaps be stated that the environment is sufficiently suitable for adaption to their activities from the evaluative point of view of the participants. Next, a number of participants wanted to do such activities as walking and exercise (28%), cycling (5%) and family picnics (5%). The main reason why users failed to do such activities was the small space of the park due to the number of visitors.
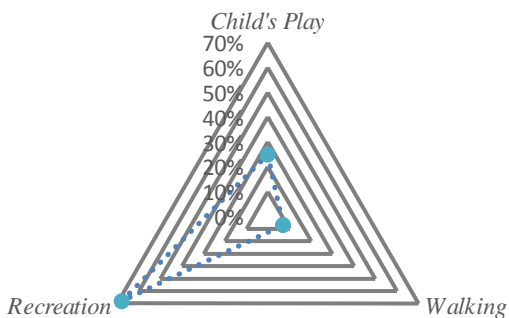
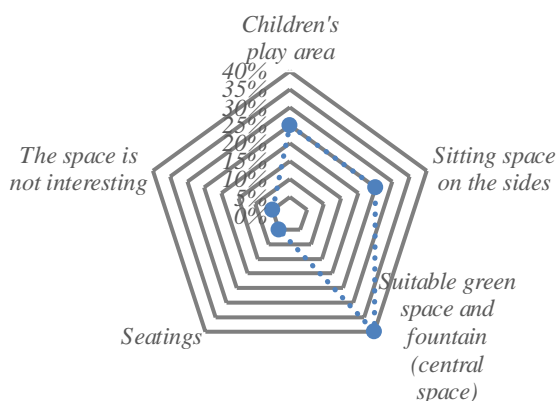**Graph 1.** Frequency of Participants' Activities
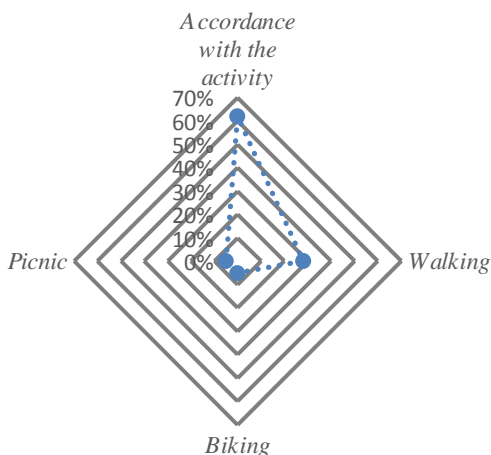
Graph 2. Frequency of Participants' Favorite Activities

From the participants' point of view, the main disadvantage that can be considered in SEKONJ Park is its small space for family activities and recreation. But other cases that users mentioned about the shortcomings of the park are the lack of playground equipment for children (for more activities and creativity of children), along with a suitable playing space for different ages. In addition to these cases, lack of safety in the existing playground (both in terms of materials used on the floor of the playground and also the proximity of the children's playground to the street) was also mentioned.
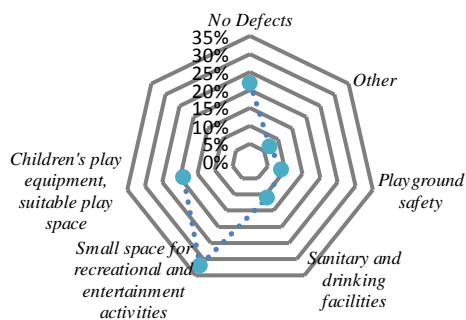

Graph 3. Frequency of Weakness Mentioned by the Participants

In analyzing the content of the interviews, one can also point to the behavioral space of interest and the characteristics of these spaces by the participants. The main positive evaluations of the SEKONJ neighborhood park space were the areas under the trees along with the sitting areas near the central fountain on the site. They expressed their interest in these areas for creating a sense of tranquility with visual presence. Also, the sitting area at the end of the park is another place where the participants mentioned their preferences to spend time in the park due to the reclusive space. The children's play space was also important and mentioned because it creates joy and liveliness as well as memories in the park space.

Graph 4. Frequency of Behavioral Spaces and Characteristics Mentioned by the Participants

In the final question, the respondents were asked to state the reason for choosing SEKONJ Neighborhood Park for their activities (Graph 5). The interviewees cited adequate access to the park from their place of residence, and suitable green space in the neighborhood as other reasons for choosing this park since there are few quality parks and green spaces in relation to the number of residents in the area. However, one of the important factors expressed by a number of participants was the appropriate social class formed in the park, which can actually be considered as regulating the patterns of behaviors in the park. In the interviews, some of the participants constantly compared the reason for choosing and visiting SEKONJ Park with the conditions of Golha Park (located near SEKONJ Park) and their presence was due to the lack of criminal behavior, the presence of neighborhood residents and families in SEKONJ Park. Other features of the park were also mentioned, which are located at a lower level. Among these features, we can mention the attractiveness and newness of the park (various designs of walls & seating) as well as suitable facilities (the number of seating spaces and lighting) from the participants' point of view.
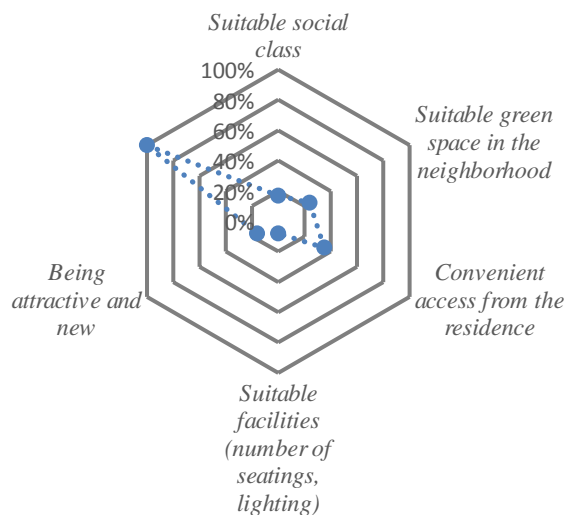
Graph 5. Frequency of the Reason for Choosing the Park in the Neighborhood from the Perspective of the Participants

4.2 . Behavioral Maps

In the production of behavioral maps, it should be noted that all the maps presented were based on direct observation and filming (the two points that had the most views of the park space were selected and the captures were taken from the intended points to analyze the behavioral setting). The first map that will be mentioned is the presence of users in the park spaces according to their age. In this map, on average (according to observations and videos) points based on the age of the users on the map were considered (Figure 5). In this behavioral map, most of the activities of children between 1 and 6 years old can be seen inside the playground as well as in the area around the playground. Also, the presence of their parents who are 30 years old and older inside the playground (Figure 5 layout 2 and Figure 7 layout 7), and seating areas embedded around the playground (Figure 5 layout 3 and Figure 7 layout 11). This sitting space around the playground, in addition to providing parental supervision, will also stimulate parental interaction. However, in the evaluation (from 18:00 to 21:00), the highest presence of people aged 30 to 59 and 50 and above is in the public and linear seating around the central fountain (Figure 5 layout 1) and especially at the end of the park which includes more privacy and relaxed places.

Another behavioral map was created according to the behavioral pattern of the users based on observations. In the analysis of this map, it can be stated that the movement path of the users and also those who walk in the park intersect with the selected path of children to cycle and skate, which in this respect may endanger the safety of both groups (Figure 6 layout 4). As mentioned in the interviewees' assessment, there is no barrier separating the children's play area from the sidewalk and the adjacent street, and this can also be seen in the behavioral map where the behavioral pattern formed in children's cycling is interrupted due to the mentioned problem (Figure 6 layout 5).

Another point is that the users use more linear and public seating to sit, which is installed on the surface of the park, and this indicates a sufficient number, correct location (especially in observations, seats at the end of the park with a wall behind them are mostly used). Flexible spaces in different parts of the park from 20 pm onwards are used by family groups (sitting on the floor) for picnics (Figure 8 layout 12). In this regard, due to the small spatial scale of the park, the visitors (inevitably) use some areas of the park in the corners, which are traffic spaces, for picnic activities (Figure 8, layout 13 and 14).

In the analysis of the maps, it should be mentioned that the SEKONJ Park has a defined and designed spatial extension and continuity in terms of visibility directions, circulation, and access to different parts of the park. "Visibility" of activities and the absence of

visual barriers serves two purposes. First, it creates a kind of "informal monitoring" over the activities carried out in the park, and, secondly, it provides the possibility of attracting other people through the "visibility" of the activities.

Fig 5. Behavioral Map of Users' Presence in Park Spaces Based on Age (Source: Authors)

Fig 6. The Behavioral Map of Users' Presence in Park Spaces Based on Behavioral Patterns (Source: Authors)

In order to more appropriately analyze the behavior of users, a map of the density of activities at different hours was prepared (Figures 7 and 8). Oftentimes the highest concentration of dynamic activities occurs near the children's playgrounds (Figure 7, layout 7 and 11). In addition, during the mentioned hours, static activities such as recreation, visiting friends and neighbors in the sitting areas by the fountain and the end area of the park take place (Figure 7, layout 8 and 10). Nevertheless, the opposite happens from 20 pm to 21 pm. In other words, static activities (Figure 8, layout 15 and 16) have prevailed in the park compared to dynamic activities, and dynamic activities, even in children's playgrounds, occupy a small percentage.
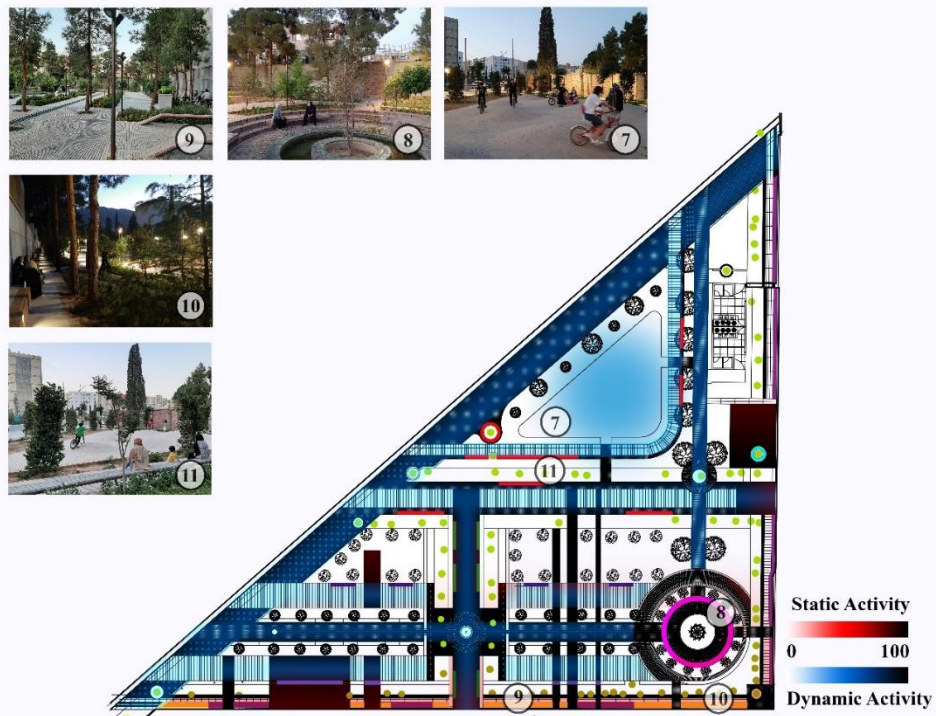

Fig 7. Map of User Activity Density in Park Spaces from 18 to 20 pm (Source: Authors)
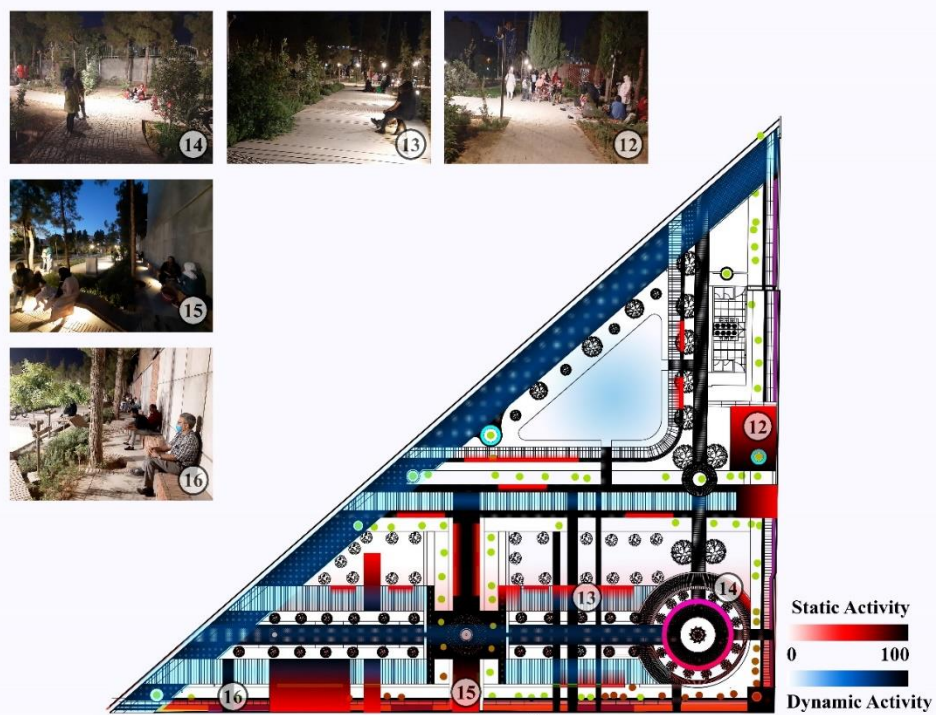

Fig 8. Map of user activity density in park spaces from 20 to 21 pm (authors)

5. DISCUSSION

Most of the studies on the behavioral environment of public realms have been conducted on the city scale or educational environments, and few studies have examined neighborhood parks as an effective behavioral setting. Through the analysis of behavioral maps and semi-structured interviews with users, this study discusses the following findings in order to improve the environmental quality of neighborhood parks.

In the research findings, the environmental quality components of the behavioral setting in the park can be assessed. As far as playing and walking are concerned, based on the behavioral plans and evaluation of the participants, the behavioral setting formed in the park has shortcomings. Such shortcomings could be based on physical criteria: a) interference of the movement path with the cycling path and children skating, b) lack of playground safety and c) lack of play space for different ages. Moreover, this activity has positive criteria that are considered as important reasons for the formation of a behavioral setting in the SEKONJ neighborhood park. The most important of these criteria include: a) proper access to children's playground and walking space for neighborhood residents (physical component), b) a suitable space for parents to sit around the playground (physical component), c) appropriate social class and d) visibility of activities and designed vision directions (physical and social component). The final criterion as well as the characteristics of the appropriate social class can be considered as positive criteria of recreational activity. Sarbandi Farahani et al. (2014) in their research, which investigated two neighborhood parks through the technique of snap-shot observation, point out that the indicators of visual and physical permeability, activity diversity, security, and environmental comfort are important in the formation of behavioral settings and can improve the quality of the environment as well as social interactions.

Regarding recreational activity, physical components such as a) suitable linear and public seating, b) the existence of focal points such as the central fountain, c) relaxing areas, and d) the design of various walls, seating, and floors that define the physical areas on the site, can be expressed as positive features evaluated. In a study by Hamzenejad and Ghelichy (2019), investigating the Park of Iran University of Science and Technology through a structured interview, the indicators of fixed furniture and the presence of water as sociable and formative factors of the behavioral setting are described from the users' point of view.

However, the only problem is the environmental quality of recreational activity in SEKONJ. The lack of enough flexible spaces for a family picnic (physical component) is one of the reasons for the small scale of the park. According to the issues raised, it can be stated that there is some synomorphy between the behavioral pattern of recreation and the designed and planned environment in SEKONJ Park. However, there is no congruency between the behavioral pattern of the children's play and the walk of the users in the milieu intended for these activities in the Park.

6. CONCLUSION

The behavioral patterns formed can provide a correct perception of the individual's relationship and interaction with the environment in which the behavior occurs. It is as if the conceptual plan of the behavioral setting structurally seeks to examine the consistency of the pattern of behavior with the environment (synomorphy), which can then be considered by the behavioral aspects of the quality of the environment in design or interventions to improve it. Neighborhood parks are also important as behavioral settings that form part of the social life of a neighborhood. Therefore, evaluating and analyzing the indicators that determine the environmental quality of these settings is useful for planners and designers.

Components that include the quality of behavioral setting in neighborhood parks can be presented in two dimensions: a) physical (welfare, recreation facilities, and site features) and b) social (social interactions). Improving these two dimensions can be considered a way to enhance the quality of behavioral setting in neighborhood parks. In the case of this study (SEKONJ Park in Shiraz city), the evaluations have been done from the perspective of citizens as well as the analyses that have been done on the produced behavior maps. It can be said that the design is in congruence with the behavioral patterns and recreational activity. On the other hand, the behavioral patterns created by children's play activities do not conform to the predicted space, and we observe unsafe functional activity with the sidewalks in the park. Based on the analyses conducted in the selected park, in order to improve the environmental quality of neighborhood parks, appropriate strategies and guidelines for design and planning can be proposed according to physical and social criteria:

• The first factor that should be considered in the strategies and guidelines adopted in the planning of neighborhood parks is planning proportional to the spatial scale so that at this stage the size of the park is

considered according to the number of residents located in the desired neighborhood;

• In order to increase the presence of residents, neighborhood parks should be located in the neighborhood so that people have adequate and balanced access to this public area;

• Spaces and activities in the planning and design of neighborhood parks should be as visible as possible and without visual obstruction so that in addition to creating informal monitoring by neighborhood residents, which increases the security of the park, other people are attracted to the behavioral setting;

• Focal points and collective spaces should be considered for the sociability of neighborhood residents. In this regard, through daily meetings of the residents, in addition to persuasion and presence of the residents, the person's interaction with the environment also increases;

• In the planning dimension, in order for the feature of self-regulation in a behavioral setting to be appropriate, the care and maintenance of neighborhood parks should be done with the participation of neighborhood residents;

• In the planning and design of parks in neighborhoods, the distribution of spaces- each of which is intended for a certain activity-, should be according to the characteristics and the impact they have on other behavioral settings so as not to disrupt other behavioral settings;

• In designing neighborhood parks, spatial characters should be considered according to the predictions made from behavioral patterns;

• Flexible spaces in the park should be planned and designed in such a way that in addition to various activities, it creates the ability to hold social and cultural events;

• Separate loops should be designed and planned for walking, cycling, and skating so that the trails do not interfere with each other in terms of functionality, or if there are spatial constraints to create a separate cycling loop, designing tactics to prevent bicycles from entering the park should be adopted;

• Playgrounds designed at the level of neighborhood parks should meet the needs of different age groups (especially children). In addition, in designing these spaces, tactics should be considered in order to ensure the safety of play spaces and the surrounding area.

Considering the appropriate analysis and measurement of the environment by the behavioral setting, perhaps other components can be mentioned to improve the environmental quality of neighborhood parks. Therefore, what is suggested as future research to achieve the components is to study neighborhood parks as a behavioral setting in low-income neighborhoods or adaptive comparison with parks that have been formed in other neighborhoods with a specific social class. Future studies could also examine neighborhood parks and other public spaces, depending on the conditions of the covid19 outbreak and the impact it has had on the behavioral settings.

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