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Assessing Environmental Components Affecting User Satisfaction With Urban Parks*

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ABSTRACT

The present study examines the factors affecting user satisfaction with urban parks. Since urban parks are considered public spaces and one of the basic rights of citizens, it is essential to pay attention to the opinions and demands of citizens to provide better designs for them. The present study aims to study the components enhancing user satisfaction with urban parks and the relationships between them. For this purpose, first, the factors affecting the quality of these spaces and user satisfaction are extracted through library studies. Next, the users of urban parks are surveyed using a researcher-made Likert-scale questionnaire to know how these factors influence user satisfaction. The present study is descriptive-survey research. The statistical population includes the users of parks in Babol City, among which the samples are selected at different hours and days. The present study is based on the issue that user-centered designs can improve user satisfaction. The results indicate that six factors influence user satisfaction, including structure, aesthetics, meaning, security, behavioral patterns, and sociability, and the security and meaning factors are the most and least important factors from the users' point of view, respectively. The high importance of the security component from the users' perspective indicates that the presence of factors such as adequate lighting, the presence of security guards, access control, support of activities, safety of park equipment and facilities, management and maintenance, and surveillance have the greatest impact on the formation of citizens' mental image of the park. There is a significant positive correlation between some of the six components, and the greatest one is observed between the two components of structure and aesthetics with r=0.417. Structure, security, meaning, and sociability factors affect three factors, and aesthetics and behavioral patterns affect two factors.

Keywords: Satisfaction, Structure, Aesthetics, Meaning, Security, Behavioral Patterns, Sociability.

* This article is derived from the first author's dissertation entitled "Modeling User Preferences For The Environmental Security In Urban Parks", defended under the supervision of the second author at Shahid Rajaee Teacher Training University in Tehran.

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1. INTRODUCTION

Parks, as a part of urban spaces, are considered a criterion for improving the quality of living space and community development, they influence people's social life (Matsuoka and Kaplan 2008; Balram and Dragicevic 2005). They act as a motivation for people for attending them to do physical activities and receive a sense of relaxation (McCormack et al. 2010). A public space is successful when it welcomes a large number of people (Paumier 2004) and people can spend their free time peacefully in it and feel satisfied with being in them. The physical, social, or symbolic features of a space influence people's sense of satisfaction with that space. Two components are used to assess user satisfaction with the environment: the qualitative dimensions of the environment and the characteristics of users.

The user is satisfied with the space if that space meets his needs. User satisfaction with a space can be assessed by asking the users of that space about how good or bad it is. The increase in satisfaction is proportional to the decrease in the difference between people's expectations and their actual experience of the environment (Mass et al. 2009).

Parks are considered a complex where people spend their free time, so, it is required to consider human-related physical standards and people's physiological, mental, and psychological needs in the design of these spaces. It is useful to perform landscape design with a collaborative approach, considering users' opinions and thoughts.

It is required to consider social factors and the needs of people who use spaces in planning green spaces (Beer and Cathy 1999). Recognizing the demands of users is one of the tasks of planners, and planners must pay attention to them in the planning process. Since park users include different classes of society with different demographic characteristics, it is necessary to consider the needs of all users and meet them in the design of parks to enhance their satisfaction with them. Moreover, it is required to revise the executive park design and planning principles according to the conditions of today's society. The present study attempts to identify the factors affecting user satisfaction as one of the factors influencing the architectural quality of parks and take a step towards improving the conditions. Its main hypothesis states that the components of the environmental quality of parks can differently affect people's satisfaction with them and if the environmental quality is not formed based on the preferences of the users, it will not bring their satisfaction.

1.1. Research Background

There are numerous studies on user satisfaction with urban public spaces and the components influencing it, some of which, for example, are presented below:

In his study entitled "Constituent Elements of Urban Design Quality", Golkar present the sustainable place model by adding the ecological dimension to Canter's sense of place model presented in 1977. According to him, urban design quality consists of three components, namely "experiential-aesthetic quality", "functional quality", and "environmental quality". Also, in his study, he introduced the components of the quality of the environment and summarized the various theories on the quality of the environment.

Pourahmad and Habibian, in their research, assessed user satisfaction with urban parks in Ahvaz City. For this purpose, they used the opinions of the users to conclude their research and qualitatively assessed and compared some parks in Ahvaz City. The results indicated that security and cleanliness were the most important components and cultural facilities were the least important ones from the users' perspective (Pourahmad and Habibian 2018).

To identify the factors affecting public attendance in urban public spaces, Maroofi and Bayzidi investigated the factors affecting public attendance in the Khanevadeh Park in Mahabad City and introduced the components of the diversity of activities, sociability, place attachment, memorability, identity, comfort, mental image, and accessibility, in order of priority, as components affecting public attendance in parks (Maroofi and Bayzidi 2018).

Also, Rafieyan and Khodaei, in their documentary study, examined the factors affecting citizens' satisfaction with urban public spaces and identified three factors of access to services, social security, and place identity, as the factors with the most impact on citizens' satisfaction and their sense of security (Rafieyan and Khodaei 2009).

The authors of the article entitled "Park Improvements and Park Activity" have investigated the impact of park improvements on their status in the city of Victoria, Australia, and sought to answer the question of whether the park improvements are effective in enhancing the presence of people to spend their leisure times and perform physical activities. The results of examining two parks indicated that park improvements resulted in a general increase in the use of the park and an increase in physical activities in all age and gender groups (Veitch et al. 2012).

2. THEORETICAL FOUNDATIONS

Considering the research topic, it is required to theoretically discuss environmental quality.

2.1. Environmental Quality

Researchers and scholars have presented various definitions for the concept of environmental quality. Environmental quality can be considered one of the most important issues in the field of urban design as many theorists consider "environmental quality improvement" as the most important task of urban design (Pakzad 2006). To investigate environmental

quality, some theoreticians pay attention only to the physical aspects and objective arena of the environment and some consider its subjective arena while there are other theorists who address both arenas (Golkar 2001).

During three periods, from the industrial revolution until now, there has been a tendency towards specific topics related to urban public spaces. In the first period, i.e. from the industrial revolution until 1960, spatial and visual perceptions were mainly emphasized (the first approach), in the second period, i.e. from 1960 to 1990, it was emphasized to enhance social interactions, expand pedestrian orientation, and pay attention to the environmental-behavioral effects of urban spaces (the second approach), and in the recent era, i.e. 1990 to present, the establishment of the physical and social roles of urban spaces has led most of the activities and theories to focus on environmental-sustainability considerations, and the creation of security, and human-centeredness in public arenas (the third approach) (Kashani Jou 2010).

Regarding the matching of approaches to urban public spaces and the proposed research components, it can be said that the "structure and aesthetics" components match the first approach (spatial and visual perceptions), the "sociability" component matches the second approach (enhancing social interactions), the "behavioral patterns" component matches the second approach (environmental effects - behaviors of urban spaces), the "security" component matches the third approach (security), and the "meaning" component matches the third approach (human-centeredness).

2.2. Urban Design Quality Models

This section presents the research model by examining Lang's hierarchy of human needs, Appleyard's model of perceptual modes of humans, Canter's place model, Punter's sense of place model, and Golkar's sustainable place model.

2.2.1. Lang's Hierarchy of Human Needs

The model presented by Joh Lang is derived from Abraham Maslow's hierarchy of human needs, according to which the quality of the urban environment can be classified based on meeting different types of human needs (Table 1).

Table 1. The Needs Raised in Lang's Model and the Correspondence of each Need with the Proposed Research Components

The Needs Raised in Lang's Model	Research Components
Physiologic Needs	Structure
Safety and Security Needs	Security
Affiliation Need	Sociability
Esteem Needs	Meaning
Freedom of Inquiry of Expression	Behavioral Patterns
Cognitive and Aesthetic Needs	Aesthetics

2.2.2. Donald Appleyard's Model

According to Appleyard's model, various components of urban design quality are classified based on responding to different perceptual modes of humans. He introduced three responsive-emotional, operational, and inferential modes (Golkar 2001).

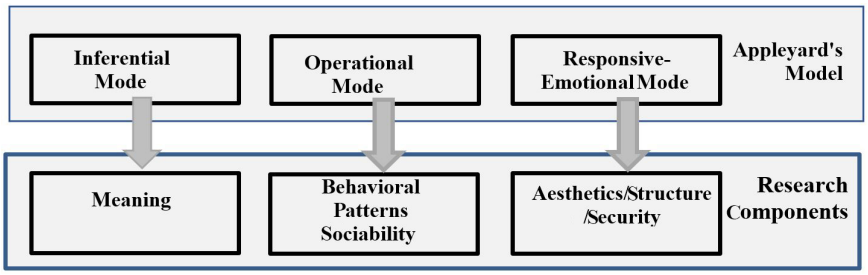

Fig. 1. A Diagram of the Three Perceptual Modes Provided by Appleyard and the Correspondence of each Mode with the Proposed Research Components

2.2.3. David Canter's Model

According to Canter's model, one can say that urban design quality consists of three components of physical attributes, people's activities, and people's imagination of the urban environment (Fig. 2).

2.2.4. John Punter's Model

The three components of form, activity, and meaning create the model of sense of place, presented by John Punter and it can be considered one of the narratives of Canter's model (Golkar 2001).

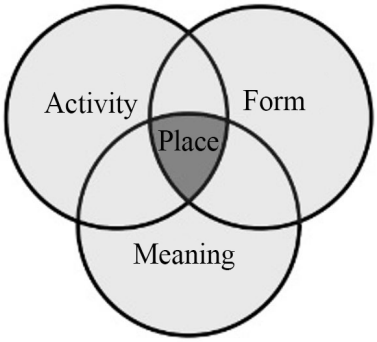

Fig. 2. David Canter's Place Model

(Canter 1977)

2.2.5. Sustainable Place Model

By adding the ecological dimension to Canter's model, the sustainable place model was obtained. In addition to the three dimensions of form, activity, and imagination proposed by Canter, Golkar adds a new dimension called ecosystem to the dimensions of place (Fig. 3) (Golkar 2001). It should be noted that in this research, the environmental component was neglected.

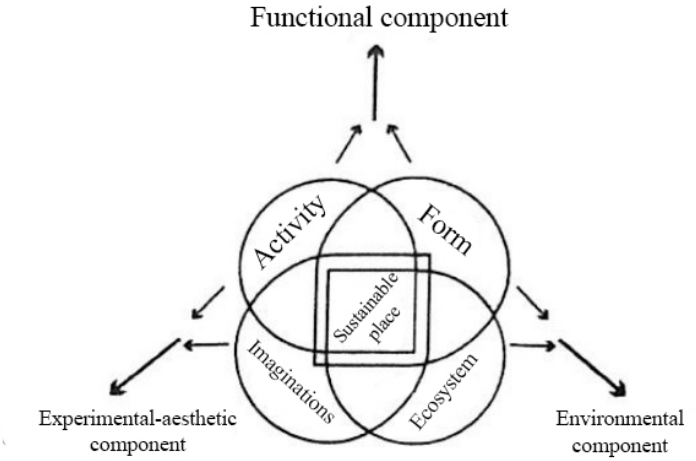

Fig. 3. Golkar's Sustainable Place Model

(Ibid)

2.3. Developing the Research Model

To explain the components of urban design quality, the present study examines various place models to present a model consisting of those components of environmental quality with the ability to satisfy the structural, perceptual, and functional contexts of the space (Fig. 4). The analysis diagram of the present research was also obtained from the topics raised in the relevant theories by reviewing numerous books and articles (Fig. 5).

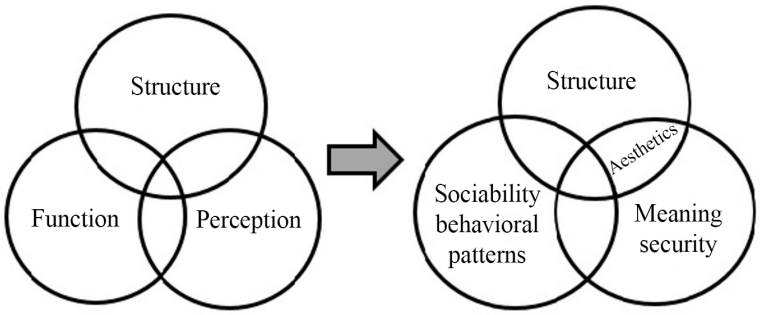

Fig. 4. Diagram of the Constituent Components of the Environmental Quality model Used in the Present Research

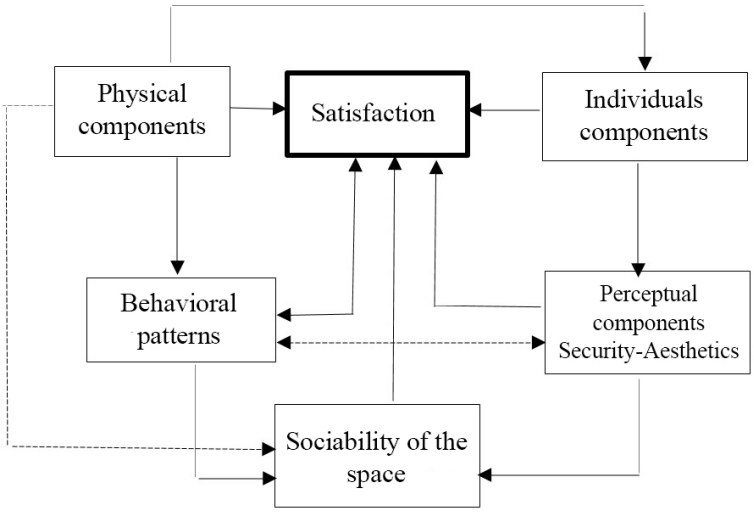

Fig. 5. Diagram of the Components Affecting User Satisfaction

Dashed lines indicate insignificant relationships between the components.

2.4. Environmental Variables Affecting the Quality of Urban Public Spaces

To examine the comprehensiveness of the proposed model, different theorists' models and points of view were reviewed, and the indicators proposed by architecture and urban planning theorists and experts were summarized to develop a questionnaire and explain the components of environmental quality. Table 2 shows the indicators influencing the quality of the environment from the points of view of theorists in order of time. Those indicators mentioned at least twice were used to develop the questionnaire. Moreover, the relevance of the indicators with the research subject was considered. For example, urban self-reliance(proposed by the London Planning Advisory Committee), urban fabric compactness (proposed by Allan Jacobs and Donald Appleyard), and democracy and community consultation (proposed by Haughton and Hunter), as well as the fabric indicator (proposed by John Punter and Matthew Carmona) and some other indicators were not used in the development of the questionnaire since they weren't relevant to the research topic. The indicators of visual richness and energy (environmental comfort) were not included in the questionnaire to keep the questionnaire comprehensive. The indicators of vitality, historic preservation, and architectural values were present in the initial questionnaire but they were removed from the final questionnaire after examining the validity of the questions.

Table 2. Indicators Affecting the Quality of the Environment from the Points of View of Theorists

	Jacobs, 1961	Lynch, 1960	Violich, 1983	Bentley et all. 1985	Trancik, 1986	Coleman, 1987	Jacobs1987	The Prince of Wales Charles. 1989	Southworth, 1989	Tibbalds,. 1989, 1990.1990	Greene, 1992	Goodey, 1993	LPAC (London Planning Advisory Committee). 1993	Prime Minister's Urban Design Task Force. 1994	Haughton, 1994	Nelessen, 1994	University of Sydney, 1996	The Design Dimension of Planning. 1997	Urban Task Force headed by Lord Rogers. 1999	Urban Design in the Planning System, 2000
The Presence of Natural Elements (Plants and Water)				*		*			*					*						*
The Status of Furniture and Amenities									*					*						
The Body of the Park Entrance									*					*						
Routes-Physical Accessibility	*	*		*	*	*					*	*	*			*	*	*	*	*
Proportions - Human Scale								*	*	*	*	*	*		*	*		*	*	*
Variety				*								*			*	*				*
Form			*						*									*		
Materials and Colors								*										*		*
Adaptability		*								*	*	*								*
Sense of Belonging							*													
Identity							*		*		*		*							*
Legibility of the Environment (Navigationplace Marking)		*	*	*	*			*	*	*		*	*					*		
Access Control		*			*															
Territoriality				*	*			*				*							*	*
Surveillance		*							*								*	*	*	
Support of Activities	*									*										
Management and Maintenance				*									*			*				
Safe ty													*					*		
Behavior Settings													*							
Normal-Abnormal Behaviors																		*		
Social Interactions	*		*				*													
Flexibility	*			*						*	*			*	*					

	Jacobs, 1961	Lynch, 1960	Violich, 1983	Bentley et all. 1985	Trancik, 1986	Coleman, 1987	Jacobs1987	The Prince of Wales Charles. 1989	Southworth, 1989	Tibbalds,. 1989, 1990.1990	Greene, 1992	Goodey, 1993	LPAC (London Planning Advisory Committee). 1993	Prime Minister's Urban Design Task Force. 1994	Haughton, 1994	Nelessen, 1994	University of Sydney, 1996	The Design Dimension of Planning. 1997	Urban Task Force headed by Lord Rogers. 1999	Urban Design in the Planning System, 2000
Diversity of Activities	*					*							*			*				*
Attendance							*			*			*						*	*
Vitality		*				*	*				*	*								
Historic Preservation			*			*				*				*						
Energy - Environmental Comfort - Sustainable Development				*							*						*		*	
Visual Richness				*						*	*		*							
Architectural Values						*										*				
Community Consultation										*					*					
Visual Order	*																			
Feeling		*																		
Mixing indoor and Outdoor Spaces					*															
Freedom of Choice			*																	
Originality							*													
Art								*												
Decorations								*												
Hierarchy								*												
Attention to Local Communities								*												
Sense of Place									*											
Gradual Process										*										
Balance											*									
Coherence											*									
Urban Fabric Compactness													*							

	Jacobs, 1961	Lynch, 1960	Violich, 1983	Bentley et all. 1985	Trancik, 1986	Coleman, 1987	Jacobs1987	The Prince of Wales Charles. 1989	Southworth, 1989	Tibbalds,. 1989, 1990.1990	Greene, 1992	Goodey, 1993	LPAC (London Planning Advisory Committee). 1993	Prime Minister's Urban Design Task Force. 1994	Haughton, 1994	Nelessen, 1994	University of Sydney, 1996	The Design Dimension of Planning. 1997	Urban Task Force headed by Lord Rogers. 1999	Urban Design in the Planning System, 2000
Satisfying Local Characteristics														*						
Perfection														*						
The Relevance of the Designs to the Conditions in the Contemporary World														*						
Security															*					
Creative Relations															*					
Centralization															*					
Integrity																	*			
Texture																		*		
Density																			*	

3. METHOD

The present study was carried out through survey and observation, using a questionnaire. Table 2 presents a general classification of indicators investigated by experts to assess user satisfaction with the environmental quality of the landscape of public spaces. Next, the obtained indicators were provided to six experts to classify them into six factors to form the goal-content table (Table 3).

Table 3. Goal and Content (Appropriate Criteria for Determining Research Questions)*

Target		Content
Factors Affecting User Satisfaction with Urban Parks	Structure Component	The Natural Element of Plants, the Natural Element of Water, the Type of Park Furniture and Amenities, the Elements of the Park Entrance, Routes, Proportions
	Aesthetics Component	Diversity, Balanced Forms, Materials and Colors, Adaptability, Architectural Values
	Meaning Component	sense of Belonging, Identity, Legibility of the Environment, Historic Preservation, Vitality
	Security Component	Access Control, Territoriality, Monitoring, Support of Activities, Management and Maintenance, Safety
	Behavioral Patterns Component	Presence of Different Behavior Settings, Normal Behaviors, Abnormal Behaviors, Social Interactions
	Sociability Component	Flexibility, Diversity of Activities, Attendance

* Vitality, historical preservation, and architectural values have been removed in the final formulation of the questionnaire.

The questions of the questionnaire were developed according to the goal-content table, and to examine the validity of the questions, they were provided to experts again and the approved questions were tested. At first, 30 questionnaires with 37 questions were distributed among park users, and the obtained data were entered into SPSS software, and Cronbach's alpha was estimated as 0.872 after removing three questions, implying the reliability of the questionnaire. The questionnaire was designed based on a 5-point Likert scale. The sample size was obtained to be 170. A total of 200 questionnaires were distributed among the park users at different times and days considering their availability and willingness to answer. The age of participants ranged between 15 and 75. Out of the 200 questionnaires distributed, 175 questionnaires were entered next research steps. Table 4 presents the personal and social characteristics of the participants. There was a gender balance (53.15% of participants were male and 46.85% were female). Regarding marital status, 58.9% of participants were single and 41.1% were married. Regarding age group, participants were categorized into 5 age groups including under 20 years old (28.6%), 20-30 years old (28%), 30-40 years old (18.9%), 40-50 years old (11.4%), and over 50 years old (13.1%). Regarding the job indicator, they were divided into five categories: student (55.4%), employee (14.3%), self-employed (13.1%), housewife (10.9%), and retired (6.3%). In terms of the number of children, they were divided into five categories: no children (66.9%), one child (8.6%), two children (12%), three children (9.7%), and more than three children (2.9%). In terms of education, the participants were categorized into four groups: under diploma (40.6%), diploma (2.4%), bachelor's degree (22.9%), and above a bachelor's degree (13.1%). The questionnaire included 6 areas: structure (6 questions), aesthetics (5 questions), meaning (3 questions), security (11 questions), behavioral patterns (4 questions), and sociability (5 questions). Non-parametric tests in SPSS software were used to analyze non-normal research data.

$$n = 170 \qquad n = \frac{z^2.\delta^2}{\varepsilon}\ \frac{(1.96)^2.(0.66)^2}{0.01}$$

$$\delta = \frac{\max(x_i) - \min(x_i)}{6}$$

$$Z\alpha\ /2 = 1/96,\ \varepsilon = 0.01,\ \sigma = 0/66 \Rightarrow n = 170$$

Table 4. Personal and Social Characteristics of the Participants

		N	Percent			N	Percent
Gender	Female	93	53.15	Marital Status	Single	103	58.9
	Male	82	46.85		Married	72	41.1
Age	Under 20 Years Old	50	28.6	Number of Children	No Children	117	66.9
	20-30 Years Old	49	28		One Child	15	8.6
	30-40 Years Old	33	18.9		Two Children	21	12
	40-50 Years Old	20	11.4		Three Children	17	9.7
	Over 50 Years Old	23	13.1		More than Three Children	5	2.9
Job	Student	97	55.4	Education	Under Diploma	71	40.6
	Employee	25	14.3		Diploma	41	23.4
	Self-Employed	23	13.1		Bachelor's Degree	40	22.9
	Housewife	19	10.9		Above a Bachelor's Degree	23	13.1
	Retired	11	6.3				

4. FINDINGS

4.1. The Effect of Dispersion Indices on Satisfaction

The general results on user satisfaction with urban parks were analyzed by gender, considering the six factors proposed, by examining dispersion indices including mean, median, mode, and standard deviation. According to the male and female participants, the mean was greater than the median (value=3) and it was higher among men than among women. Table 5 presents dispersion indices.

Table 5. Dispersion Indices

	Mean	Median	Mode	Standard Deviation
Female	3.94	3.97	3.45	0.41
Male	4.00	3.97	4.04	0.36

Also, investigating the frequencies of the studied six indicators and their relevant sub-indicators shows that male participants recognized all sub-indicators, except for surveillance and behavior settings, and female participants recognized all sub-indicators, except for behavior settings and flexibility.

4.2. Prioritization of Sub-Indicators according to their Correlation with the Main Indicator

For female participants, the sub-indicators were prioritized as follows: diversity of activities, variety, natural elements (plants-water), management and maintenance, identity, legibility of the environment, balanced forms, the presence of different behavior settings, flexibility, proportions, abnormal behaviors, normal behaviors, safety, social interactions, territoriality, materials and colors, surveillance, sense of belonging, adaptability, the elements of the park entrance, sociability, routes, support of activities, access control, furniture.

For male participants, the sub-indicators were prioritized as follows: variety, normal behaviors, diversity of activities, balanced forms, sense of belonging, management and maintenance, natural elements (plants-water), furniture, territoriality, presence of different behavior settings, safety, abnormal behaviors, identity, legibility of the environment, support of activities, adaptability, surveillance, materials and colors, social interactions, access control, proportions, sociability, the elements of the park entrance, flexibility, routes.

4.3. Hypothesis Testing

Hypothesis: It seems that there is a significant relationship between structure, aesthetics, meaning, security, behavioral patterns, and sociability factors with user satisfaction and they influence it to different degrees.

The results of Spearman's correlation test indicate how the six independent variables and the dependent variable of satisfaction correlate, as listed in Table 6. The results show a significant correlation between each factor and satisfaction. Also, the standardized coefficients (β-value) in Table 7 show that the security factor has the most impact and the meaning factor has the least impact in explaining user satisfaction with urban parks.

Table 6. The Results of Spearman's Correlation Test between User Satisfaction and each Factor Alone

	User Satisfaction					
Factor / Gender	Structure	Aesthetics	Meaning	Security	Behavioral Patterns	Sociability
female	0.781	0.672	0.746	0.885	0.723	0.806
Male	0.670	0.751	0.598	0.867	0.627	0.622
Total	0.744	0.710	0.682	0.874	0.686	0.726

Table 7. The Results of the Regression Test between User Satisfaction and each Factor

Factors	Structure	Aesthetics	Meaning	Security	Behavioral Patterns	Sociability
B-value Sig.	0.201 Sig=0.000	0.212 Sig=0.000	0.134 Sig=0.000	0.358 Sig=0.000	0.223 Sig=0.000	0.199 Sig=0.000

The results of Spearman's correlation test between the factors affecting satisfaction were significant (sig.<0.05). According to Table 8, the structure factor is positively and significantly correlated with aesthetics, meaning, and behavioral patterns, aesthetics with security, and meaning with security and sociability, meaning that increasing the quality of factors results in an increase in other factors and vice versa. No significant correlation was found between the other factors.

Table 8. Results of Spearman's Correlation Test between Factors Affecting User Satisfaction

Correlation between Variables		Structure	Aesthetics	Meaning	Security	Behavioral Pattern	Sociability
Environmental Quality		r Sig*					
Factors Affecting User Satisfaction	Structure		0.417 Sig=0.000	0.226 Sig=0.003	0.135 Sig=0.078	0.182 Sig=0.017	0.025- Sig=0.744
	Aesthetics			0.043 Sig=0.578	0.250 Sig=0.001	0.054 Sig=0.483	0.003- Sig=0.971
	Meaning				0.289 Sig=0.000	-0.027 Sig=0.721	0.175 Sig=0.022
	Security					0.056 Sig=0.467	0.303 Sig=0.000
	Behavioral Patterns						0.376 Sig=0.000
	Sociability						

According to the obtained results, the security factor with r=0.874 has the most impact on user satisfaction, and the meaning factor with r=0.682 has the least impact on user satisfaction. There is a significant and positive relationship between some factors, and the factors of structure and aesthetics have the greatest influence on each other (r=0.417) (Fig. 6). For example, the correlations between some factors are presented below:

- Environmental pollution on the body of spaces provides opportunities for criminals. (aesthetics and security);
- The legibility of the environment (meaning and security);
- Traffic segregation and fairness of access (structure and security);
- The emergence of a sense of belonging by increasing social relations and interactions through various programs in the park (meaning, behavioral patterns, and sociability);
- Sociable spaces become places giving identity to space users (sociability and meaning).

Also, although there is no significant correlation between some components, the correlation between them can be observed and perceived in the parks. For example,

- Reducing the abnormal behavior of entering the grass area by properly separating the grass area from the communication network in the park using beautiful hedges (aesthetics and behavioral patterns);
- Worn-out furniture provides the ground for damaging them (security (management and maintenance) and behavioral patterns).

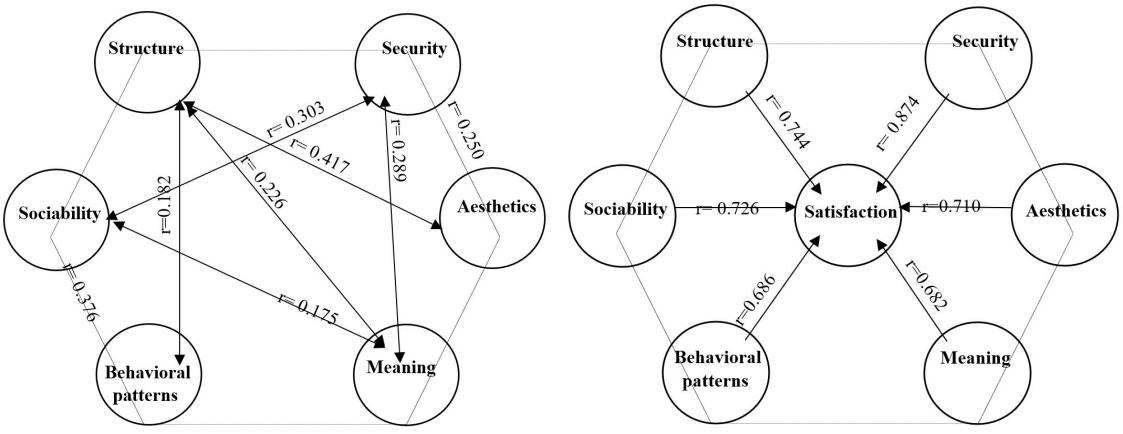

Fig 6. The Results of Spearman's Correlation test between User Satisfaction and each Factor Alone and the Partial Correlation Test between Factors

5. DISCUSSION AND CONCLUSION

To achieve environments with desirable quality, it can be useful to consider user preferences in design decisions. In the present research, the components influencing user satisfaction were obtained as key indicators, including structure, aesthetics, meaning,

security, behavioral patterns, and sociability, which can be used in the design and planning of spaces by designers and planners.

According to the results of Spearman's correlation coefficient, all the components of the environment quality are positively and significantly correlated with user satisfaction (at a 95% confidence level), meaning that overall user satisfaction increases significantly as satisfaction with each of these components increases. It should also be noted that the security component with r=0.874 has the most impact on user satisfaction and the meaning component with r=0.682 has the least impact on it. To enhance user satisfaction with urban parks, it is suggested to consider the following priorities in taking management measures: security, structure, sociability, aesthetics, behavioral patterns, and meaning, respectively. Among the six components, the security component was identified as the most important component from the users' point of view, indicating according to people, the sense of security in the space and the presence of factors such as adequate lighting, the presence of security guards, access control, support of activities, safety of park equipment and facilities, management and maintenance, and surveillance have the greatest impact on the formation of the citizens' mental image of the park. There is a significant and positive correlation between some of the six components, among which, the two components of structure and aesthetics are most correlated with r=0.417. In fact, Structure, security, meaning, and sociability factors affect three factors, and aesthetics and behavioral patterns affect two factors.

6. SUGGESTIONS

Table 9 provides some design solutions for each sub-indicator.

Table 9. Design Solutions for Sub-Indicators

Factor	Indicator	Design Solutions
Structure	Furniture	- Adequate furniture (benches, trash cans, pavilions, etc.)
	The Body of the Park Entrance	- The invitation feature of park entrances - Considering multiple entrances in large parks and considering proper access
	Routes	- Designing appropriate entry and exit routes - Considering different routes for pedestrians, riders, disabled people, etc.
	Plants, Water	- The presence of adequate suitable vegetation - The presence of water in different forms (fountain, pond, waterfall, etc.)
	Proportions	- Observing the human scale in designing furniture - Considering paths with suitable dimensions - Considering proportions in designing different parts of the park according to the number of users
Aesthetics	Variety	- Variety of vegetation (using plants whose colors change in different seasons.) - Placement of spaces at different elevations (elevation difference)
	The Balanced Forms	- Considering familiar forms and volumes at the entrance of the park and buildings in the park
	Materials and Colors	- Coordination between the materials and colors of bodies, furniture, etc.
Meaning	Sense of Belonging	- Considering defined limits for activities and different age groups in the park - The presence of symbolic signs in the park - Creating conditions for the formation of collective memory
	Identity	- Paying attention to the historical and identity concepts of the city in a symbolic way (such as placing a statue) - Strengthening mental landmarks
	Legibility of the Environment	- Presence of signs in different parts of the park (place marking) - Designing legible paths
Security	Surveillance	- Creating the view of the park from the street by creating transparent bodies - Creating the view of the park from the surrounding buildings - Designing vegetation in a way that does not obstruct the view of the surroundings and does not create an enclosed space. - Avoiding the design of defenseless and crime-prone spaces - Proper lighting of the park at night

Factor	Indicator	Design Solutions
Security	Access Control	- Considering guards at the entrance and different parts of the park - Considering public transport stations around the park
	Territoriality	- Designing privacy through the special layout of benches and the establishment of pavilions in the park
	Support of Activities	- Establishing some 24-hour activities to keep the space alive during the times at which public attendance decreases.
	Management and Maintenance	-Smart park management - Installation of adequate high-quality trash cans in the park - Timely and correct collection of garbage from the park - Installation of adequate high-quality drinking fountains and the presence of healthy drinking water - Inspecting food quality in buffets, restaurants, and stores in the park
	Safety	- Removal or repair of worn-out park furniture - Control and inspection of furniture to ensure proper connections between parts, etc. - Segregation of walkways and bike paths - Using soft soil, sand, and sponge flooring for children's playgrounds
Behavioral patterns	The Presence of Behavior Settings	- Installing signs and considering open spaces with good visibility for making appointments - Considering spaces suitable for pausing and gathering - Considering active stomping grounds belonging to different groups
	Normal Behaviors	- Creating the ground for the occurrence of normal behaviors
	Abnormal Behaviors	- Dealing with abnormal behavior in the park
	Social Interactions	- Designing spaces for communication (benches facing each other, etc.) - Holding group classes, sports activities, etc. with proper management
Sociability	Flexibility	- Building spaces with the ability to accept various functions and activities - Increasing social interactions using portable chairs
	Diversity of Activities	-Holding various events in the park - Creating grounds for various activities (sports places, children's playgrounds, etc.)
	Sociability (Attendance)	-Conditioning the park for all age groups - Choosing appropriate geometric space form for public gatherings - Using suitable furniture with correct placement to encourage people to gather

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