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Utilization of the Environmental Preferences of the Users as an Approach to Improving Urban Riverside Spaces; Case Study: Babolrood Riverside, Babolsar*

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ABSTRACT

The urban can form the users' behaviors and at the same time adapt to their behaviors. Therefore, the creation of spaces derived from the users' demands and needs (preferences of space users) to make lively and dynamic spaces with a specific identity to achieve the highest resident satisfaction seems to be necessary. The present study has aimed to achieve a more desirable space in line with the users' demands and needs by investigating the preferences of users of Babolrood riverside in Babolsar, and the use of the data extracted from their experiences. It is a survey conducted in two stages: The first stage is observation and the second stage is performing interviews in the form of a semi-structural questionnaire consisting of a combination of survey, scoring, prioritization, and explain questions. The final number of questionnaires was 324 and it was tried to collect all the data extracted from the questionnaires as the main interview data in the form of simple and legible tables divided by the type of questions. Qualitative content analysis was used to analyze the interviews. Also, in some cases, the categorization of the items and data was used. After analyzing and matching the data, the most important annoying items for the users were categorized into three categories of interference, disturbance, and noise (noise pollution). Also, the Mann-Whitney U test was used to analyze some items of the questionnaire, and it was revealed that the level of lighting at night has not been appropriate in the studied area, while the users were satisfied with the urban furniture. Generally, the most important cases as the environmental preferences of the users are safety and security, privacy, spatial hierarchy, pedestrian-orientedness, and lack of noise pollution. Some suggestions were provided to solve these problems. In addition to the abovementioned, the results obtained from the present study also confirmed the results of some cases in the research background.

Keywords: Urban Space, Environmental Preferences, Babolsar, Babolrood, Riverside.

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1. INTRODUCTION

The issue of welfare, prosperity, and psychological needs of the citizens is a matter forgotten at the pace of industrialization and technological revolution (Neghabi 2014). The cities of the world are in urgent and serious need of spaces that can meet the social and cultural relationships of people (Koleini Mamaghani et al. 2015).

The public arena as the place in which the most human contact and interactions occur are considered to be the most important part of the city, which consist of all parts of urban texture physically and visually accessible for the majority of the society (Valizadeh and Andalib 2017). Since the man-space relationship is depicted in a context named environment on various scales and is expanded concerning the trend of transformation of the society and the city (Razaghi 2013), the built environments are constantly changing through countless methods. Some transformations are rapid and some are slow (Handy et al. 2002). On the other hand, the urban space, as a built space, can facilitate the social relationship or be a barrier to it, and influence it or be under its influence (Tavallaei 2003). According to Gehl, the main function of social spaces is the creation of an arena for living in the space between buildings, unplanned routine activities, pedestrian traffic, short stops and pauses, and simple games and social activities (Rezaei et al. 2016). Therefore, building public spaces for people who try to overcome the shortage of human relations and interactions is necessary.

Although the urban landscape is often considered and paid attention to as a visual phenomenon, at the same time, it can trigger memories, recall experiences, and evoke emotional reactions (Carmona et al. 2010). Therefore, the form of these spaces can create a pleasant or difficult experience (Farsi et al. 2017). The absence of people in the collective spaces is among the important causes of the reduction of social life and a sense of attachment of the residents (Sayyaf Zadeh et al. 2012). In fact, the urban space, in addition to forming its users' behaviors can also adapt to their needs (can be formable). Therefore, the creation of spaces derived from the users' demands and needs (preferences of space users) to make lively and dynamic spaces with a specific identity to achieve the highest resident satisfaction seems to be necessary. One of the main problems of modern cities is the formation of urban elements without consideration for the tastes and even the basic needs and functions of these public spaces in the city. In other words, the development, progress, or even design of the urban spaces without consideration for the environmental preferences of the users causes the presence in the environment to fade, which in turn is caused by the lack of safety and security, the lack of flexibility of the space, the lack of ability of the space to attract the audience from different social groups, etc. One of the main issues observed in the studied area was the inability of the urban space to meet the needs of its users' needs who were from form different social classes, regarding its high potential for attracting them. The most important issue observed in this area was the lack of continuous presence in this area, lack of social incidents, low presentability, crowdedness/desertedness beyond imagination in a sudden and unexpected way, and most importantly, the interference with normal activities that cause the dynamism and vitality of the urban space, as well as the transformation of some points into a dark, lonely and far from visual permeability, which reduces the feeling of security and has turned the existing space in the studied area more as a side to pass in different forms. Therefore, it seems that recognition of the spatial needs and preferences of the users in urban spaces can be a means to achieve an increase in attachment to the urban space which itself raises the city's vitality, dynamism, flexibility, and finally, sustainability.

2. RESEARCH BACKGROUND

Some studies conducted in this field are presented in Table (1).

Table 1: Similar domestic and international studies

Author/ Date	Title	Objective	Research Methodology/ Instrument	Results
Golrokh (2019)	The Application of Environmental Preferences Criteria in Public Space Assessment, with an Emphasis on the Sense of Place	Testing the application of quality criteria and concepts in evaluating an urban space	Field study/go-along interview	With the help of the concept of a sense of place, it is possible to clarify the expert evaluation framework of the degree of preference for urban space
Lak and Ramezani (2018)	Users' Preferences for Designing Spaces under Urban Bridges as Vital Urban Spaces	Reaching a conceptual framework based on the environmental preferences of the users of the unmanaged space under the bridges based on the demands of the space users	Qualitative/ documentation and interview	Air pollution and noise pollution, and safety and security are the most important qualities influencing people's preference for urban space.

Author/Date	Title	Objective	Research Methodology/ Instrument	Results
Dadashi et al. (2018)	Investigating Residents' Perceptions, Experiences, and Preferences to Improve Performance in Buildings with an Environmental Approach	Evaluating the qualitative level of the residents' experience in the existing situation in both private and public spaces between buildings and identifying the design environmental factors according to the preferences and tastes of the residents.	Qualitative/ questionnaire	After analyzing the questionnaires, several cases have been discussed and mentioned regarding the residents' preferences.
Nazarpour et al. (2018)	The Effect of Spatial Configuration of Student Dormitories on the Students' Space Preferences	Evaluation of residents' satisfaction in dormitory spaces regarding the spatial configuration	Qualitative/ questionnaire and spatial analysis	The depth, accessibility (physical and visual), and spatial hierarchy have made living in an apartment dormitory significantly more desirable for students than living in a linear dormitory by influencing the configuration of the student dormitory.
Shakeri Eski & Litkohi (2015)	Cultural Differences, an Influencing Factor on Students' Environmental Preferences Regarding the Dormitory Space (Case Study: Iran and Cyprus)	The effect of cultural differences on students' environmental preferences regarding the dormitory space	Qualitative/ questionnaire	Examining and enumerating the preferences and tendencies of the students of the two countries based on the analysis of the results of the questionnaire
Im (1984)	Visual Preferences in enclosed Urban Spaces: An Exploration of a Scientific Approach to Environmental Design	The relationship between visual preferences and ratio variables in closed spaces at Virginia Tech College	Estimation of the beauty of the landscape	The visual quality of urban enclosed spaces can be estimated through a linear combination of the ratio of the three variables of the land slope, height ratio, and vegetation.
Kaplan (1987)	Aesthetics, Affect, and Cognition: Environmental Preference from an Evolutionary Perspective	Providing a theoretical framework for research in the field of environmental preferences	Analysis/ model provision	In this research, a model based on mystery, complexity, readability, and coherence was presented based on different variables
Herzog (1992)	Cognitive Analysis of Preferences for Urban Spaces	Re-measurement of preference factors presented by Kaplan	Non-parametric analysis	Coherence and complexity are positively related to preferences and the age factor is negatively correlated with it
Khaleghi Moghaddam (2016)	Assessment of Satisfaction and Environmental Preferences of Students	Examining the role of university quality in the satisfaction of art students	Qualitative and survey/ use of photography, behavioral observation, and questionnaire	Tabriz art students' satisfaction with the university environment has been at an average level. Identity and readability, access to university, sociability, livability, territoriality, and control are the main physical-psychological factors.

Author/Date	Title	Objective	Research Methodology/ Instrument	Results
Wang et al. (2019)	Characteristics of Urban Green Spaces in relation to Aesthetic Preference and Stress Recovery		Using a direct classification approach to focus on aesthetic preferences and improve stress simultaneously	General results regarding aesthetic preferences between landscape elements are enumerated
Lu & Fu. (2019)	Focus on Reclaiming Faculty Space: Reconstructing Faculty based on Students' Environmental Preferences	Achieving important perceptual factors related to the selection of different landscape types by university students	Qualitative/ questionnaire	Spaces with fountains have the most optimal amount of institutional attention, followed by green spaces, yards, and square spaces
Cassarino et al. (2019)	Cognitive and Sensory Dimensions of Older People's Preferences of Outdoor Spaces for Walking: A Survey Study in Ireland	Achieving the cognitive and sensory dimensions of preferences in outdoor spaces for walking	Survey/ interview	The main preferences of the elderly for walking included green space, social interaction, and space for staying in the city
Birenboim et al. (2019)	The Utilization of Immersive Virtual Environments for the Investigation of Environmental Preferences	The possibility of using and the benefits of using virtual environments to measure people's environmental preferences	Cyberspace and questionnaire	The results support the feasibility of using this method, some limitations and disadvantages should be acknowledged
Sood et al. (2020)	Spacematch: Using Environmental Preferences to Match Occupants to Suitable Activity-Based Workspaces	Implementation and testing of the Spacematch software platform, which is designed to improve the allocation and management of activity-based workspaces	Empirical testing and experiment	Using primary data, residents' preferences have been divided and categorized into different types

3. THEORETICAL FRAMEWORK

In the following, the theoretical foundations of the research will be dealt with.

3.1. Correlation between Space and Behavior

Space and place are exactly where daily life occurs (Rabei and Shariat Manesh 2020). Place attachment, the meaning created in a quite familiar place, and place identity are correlated with the physical space (Tavakolian Ferdowsieh et al. 2016). "Meaning" in place depends on the visual features, interactions between men, and the behaviors and activities that occur in it (Mirzaei et al. 2012). The individual and collective behaviors in the place originate from the principles and values derived from its people's beliefs and ideology. The higher the match between the spatial and physical, and beliefs of society members, the higher the sense of attachment to that place (Pirbabaei and Sajjad Zadeh 2011). As a result, the increase in attachment to urban places and spaces guarantees urban vitality and dynamism.

3.2. Urban Landscape

In some studies, the urban landscape has been considered a combination of the objective, subjective, and emotional landscapes which form the basis for behavior (Rasooli and Rahimdokht Khorram 2009). But what requires more attention is the nature of the urban landscape whose objective dimension is considered based on human activities and the degree of adaptation of the activities to the body of the city. Generally, the citizens' perception of the city formed through the perception of urban symbols (physical dimensions) and meaning (subjective dimensions) (Mansuri 2009) can be considered as the urban landscape. Since the urban landscape covers both dimensions of the body and the quality of the city at the same time, the city's perception is the same as the urban landscape. The urban landscape is first

perceived through the body and emotions, but the person's mentality gives meaning to it. The urban landscape is neither mere memories (Intangible-subjective) nor mere body (tangible-objective). it is a subjective-objective phenomenon obtained in the city from the interaction between the two (Atashin Bar 2009). Therefore, the urban landscape can be considered a tangible and objective part of the city that contains the embodiment of meaning, function, culture, and identity.

3.3. Sidewalk

A pedestrian area is a safe and comfortable place where users of any age and ability can feel the fit and charm of walking, not only during leisure time but also in the use of the equipment and commuting (Pirbabaei et al. 2016). On the other hand, sidewalks can be considered as a place on the scale of the whole city, which establishes the collective participation of citizens and, in addition to the role of communication and access, creates a place for the occurrence of various types of social interactions, from communication and social contact to sightseeing and ... (Abbaszadeh and Tamri 2012). Finally, it can be said that the sidewalk has been the urban space's answer to human needs, along with the physical density of buildings and roads, and a context that with a significant position in terms of physical and spatial aspects providing the means for citizens' civic flourishment.

3.4. Urban Rivers and Riversides

Rivers in urban areas can become a factor to moderate the weather and create very suitable landscapes for city dwellers (Sashurpour and Elyasi 2015). According to their location, riversides can be considered natural and urban spaces at the same time. Of course, the placement of these spaces within the city turns them into urban spaces that have a natural origin and have expanded over time. Riversides can be considered a set of natural and artificial features that are one of the most attractive spaces in cities since they have created a platform of social activities and interactions in joint with the ecological environment (Pirbabaei et al. 2016). In fact, in addition to the ecological dimension of urban rivers, the social dimension is also important in urban riverbanks because these spaces are a combination of nature and culture. Therefore, the natural structures within the city body improve the quality of cities, and ecological, aesthetic, and social values. Such natural spaces are also very important for the sustainability of the city.

3.5. Urban Environment Quality and Users Preferences

One of the ways to measure the quality of urban environments is to evaluate the set of positive and negative factors influencing the perception of residents (Rafeian and Asgarizadeh 2009), which turns the quality of the environment into an abstract concept that includes the mental perceptions, attitudes, and values of different groups and people. As a result of human and natural works, it manifested in different spatial scales (Mohammadian and Gohar Motahar 2018). In fact, the quality of the urban environment is the social, cultural, economic, and physical-spatial conditions of the urban environment, which shows the satisfaction or dissatisfaction of the citizens with the urban environment. The quality of the urban environment is an aspect of the quality of life that includes people's sense of welfare, comfort, and satisfaction from the physical-spatial, socio-economic, environmental, and symbolic factors of their living environment (Azadkhani et al. 2015). On the other hand, the meaning of environmental preferences in this article is the parameters that the users of the urban space have desired for their existence or have shown interest in improving, changing, and replacing them. It is pointed out that environmental preferences have a two-way relationship with the urban space, and the users of the desired urban space, according to the qualities and subjective perceptions resulting from experience in a time-based process, demand the presence of some elements or even the absence of some others, based on cultural, experimental, taste, or even identity dimensions.

Examining the preferences of space users, especially urban spaces, is so important that so far, many extensive studies have been conducted in this field. Higher achievement of these preferences guarantees to improve in the quality of urban spaces. For this purpose, the present research answers the following questions:

3.6. Research Questions

The main questions are as follows:

- What are the environmental preferences of the users of the Babolrood riverside in Babolsar?
- What features should the urban spaces in the Babolrood riverside have to meet the needs and demands of its users (environmental preferences)?

4. METHODOLOGY

In the present qualitative study, the survey method has been used to answer the questions. The primary data was collected in 48 days in a year (14 days per month) to obtain adequate information and estimate the frequency of the users of this area, their gender, and age groups. Photography tools, direct observation, and recording reports in the studied area were used to record the users' behaviors. For the field survey, a semi-structural questionnaire was distributed to the users. The content validity of the questionnaire was approved by experts in the field. To estimate the number of questionnaires needed, the Morgan Sample Size Table was used. In the last census conducted in 2016, Babolsar's population

was reported to be 135191 persons (Iran Statistics Center 2016). Using the Morgan Table, the number of completed questionnaires was reported to be 383. The final number of questionnaires was 324. After filing each questionnaire, the respondents were asked to recheck the information and confirm their validity, to prevent any possible errors. Also, in some cases, all responses by the respondent were studied so that his information was approved. After data collection, the observational data were analyzed by the use of SPSS, and finally, using the content analysis method, all the data obtained from the interviews were analyzed and after matching this data with the observational data, the results were obtained.

4.1. Introducing the Case Study

Babolrood, which originates from the Babol mountains, plays an important role in the irrigation of Babolsar lands. Babolsar is one of the beautiful cities of Mazandaran, which has many tourist attractions and has received more attention than other parts of the northern, recently (Rordeh 2016).

The observation site, according to Figure (1), starts from the estuary of Babolrood, which is the coastline and extends to the Persian Gulf Square, with a length of approximately 2 kilometers. In this area, there are facilities such as a coastal walkway, riverside walkway, commercial-service facilities as well as residential facilities, and at the same time, this part of the riverside has somehow been combined with the urban environment and associated with some administrative facilities of Babolsar city.

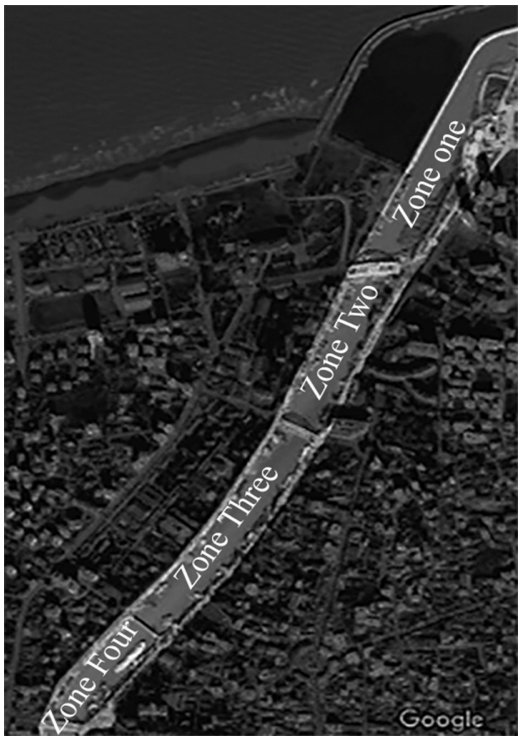

Fig. 1. Case Study
(google maps)

5. FINDINGS

After observing and collecting data, all the extracted information has been analyzed and presented in the form of a table. Behavioral sampling was done for 12 months, 4 days per month (Saturdays, Mondays, Thursdays, and Fridays), and in time intervals of 4 to 6 hours. The number of people on the mentioned days by gender and age group is shown in table (2).

Table 2. Number of Observed People Divided by age Group and Gender

Female			Total Female	Male			Total Male	Child	Total
Adults	Elderly	Teenager		Adults	Elderly	Teenager			
12.377	4.167	2.135	18.679	11.355	4.691	2.722	18.768	2.713	40.160

As seen in the table, the highest presence in the case was observed for adults in both genders. The total number of people in different age groups (except for children) is close to each other and a slight difference is observed. The total number of people observed on the specified days (over the course of a year) is 40.160 people.

Simultaneously with the observation process, interviews were also conducted with some of the observed people. These semi-structured interviews were provided to the users in the form of questionnaires and they were asked to answer the questions. The questionnaire was a combination of different questions: survey, scoring, prioritization, and explain questions. In some cases, the snowball[1] sampling method was used to complete the questionnaires, because in some cases the users did not have the ability to answer the questions or were unwilling to fill in the questionnaire or conduct an interview.

In some cases, especially for the age groups of children as well as the elderly, the researcher had to read out the questions and write down the answers, which included most of the interviews.

In the first part of the questionnaire, the demographic information of the respondents was examined. According to the information obtained, out of the total of 324 respondents, 51.55% (171 people) are female and 48.35% (153 people) are male. The largest group of participants were adults (50.9%), followed by the elderly (29.3%). In addition, 54% of the respondents had a diploma and about 46% had an academic education (bachelor's degree and above). Also, 82.4% of the respondents were residents of Babolsar city.

As the first question, the users were asked to specify the sequence of the use as well as its form. Based on the responses in the interviewees, Figures (2) and (3) show the frequency charts according to their tendency of commute in the case study. Also, the frequency of preference to use the riverside of Babolrood based on the responses of users is given in the graph.

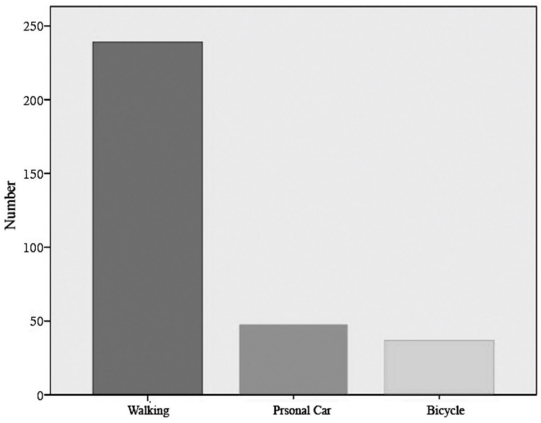

Fig. 2. The Graph of Preferences for how User's Traffic

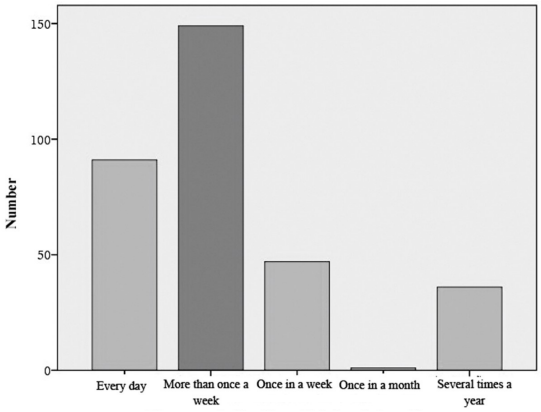

Fig. 3. The Graph of the Traffic of the Respondents

Then, all respondents were asked to announce the times they usually choose to be present in the case study in the first and second halves of the year. For the second half of the year, all respondents chose the 18-19 hour time interval, while for the first half, 321 people chose the 20-21 hour time interval. Table (3) presents a summary of the environmental preferences of the users of Baolrood riverside based on the area of interest for walking, the reason to choose any area, and the number of people to be present and perform the behavior or activity.

Table 3. Frequency of Division of the Area of Interest and Reasons to Choose Them

Area	Area of Interest for Walking	Frequency	Reason to Choose the Area	Frequency	Number of those Who Prefer to Walk in the Area	Frequency
Area No.1	Shora Park	48	Riverside Sidewalk	2	Single	99
			Playground and Shora Park	9		
Area No.2	From Shora Park to Car Bridge	97	Saray-e Mehr	63	Twosome	138
			School	23		
			Cultural Center and the Library	8		
Area No.3	From Car Bridge to Cable Bridge	139	River or Riverside	215	Threesome or More	87
Area No.4	From the Cable Bridge to the New Square	40	Cable Bridge	4		
	Total	324	Total	324	324	

Then, the respondents were asked to score the activities and attractions in the Babolrood riverside in the order of priority and determine the weight of each option. The results are shown in tables (4) and (5).

Table 4. Frequency of Priorities and Attractions from Users' Point of View

First-Priority Activity	Frequency	Second-Priority Activity	Frequency	The First Attraction of Babolrood Riverside	Frequency
Walking and Exercise	10	Walking and Exercise	21	Green Area and the River	324
Shopping	1	Shopping	3		
Seeing the Green area and the River	295	Watching the Green area and the River	11	The Second Attraction of Babolrood Riverside	Frequency
Talking to Others	11	Talking to Others	55	Seeing People and Activities	10
Entertainment	5	Entertainment	30	Existing Uses	160
Walking and Enjoying the Nature	2	Shopping	199	Sidewalk Quality	98
Seeing People and Activities	0	Seeing People and Activists	5	People	56
Total	324	Total	324	Total	324

Table 5. Frequency of Negative Activities Priorities from the Users' Point of View

First Negative Activity from Users' Point of View	Frequency	First Negative Activity from Users' Point of View	Frequency
Begging in Different Forms	98	Begging in Different Forms	158
Strolling	175	Strolling	13
Existing Uses	21	Existing Uses	18
Vendors	30	Vendors	125
		Seeing Activities	6
		Other	4
Total	324	Total	324

Next, the users were asked to give their opinion on news statements about the adequacy of furniture, suitable space for sitting and resting, the appropriateness of the location of urban furniture, and the level of lighting at night, based on a five-option Likert scale from among the options "strongly disagree, disagree, neither disagree nor agree, agree, and strongly agree". Table (6) is drawn according to the answers extracted from the questionnaires.

Table 6. Frequency of the Data related to Hypotheses based on the Likert Scale

Gender	Presence of Adequate Furniture for Various Activities					Total
	Totally Agree	Agree	Neither Disagree nor Agree	Disagree	Totally Disagree	
Male	0	3	5	71	92	171
Female	0	2	19	63	69	153
Total	0	5	24	134	161	324
Weight Percentage	0	1.54	7.4	41.35	49.69	100

Gender	The Appropriate Area for Sitting and Resting					Total
	Totally Agree	Agree	Neither Disagree nor Agree	Disagree	Totally Disagree	
Male	0	2	24	71	74	171
Female	0	1	20	75	57	153
Total	0	3	44	146	131	324
Weight Percentage	0	0.92	13.5	45.06	40.43	100
Gender	Appropriate Placement of the Urban Furniture					Total
	Totally Agree	Agree	Neither Disagree nor Agree	Disagree	Totally Disagree	
Male	0	0	75	56	40	171
Female	0	1	72	51	29	153
Total	0	1	147	107	69	324
Weight Percentage	0	0.3	45.37	33.02	21.29	100
Gender	Level of Lighting at Night					Total
	Totally Agree	Agree	Neither Disagree nor Agree	Disagree	Totally Disagree	
Male	0	0	1	34	136	171
Female	0	0	3	29	121	153
Total	0	0	4	63	257	324
Weight Percentage	0	0	1.23	19.44	79.32	100

The data in Table (6) was entered in the SPSS after extraction and categorization. Since the Likert-scale-based scoring is of stepwise type, Mann-Whitney U Test was used for analysis. The results obtained with alpha=0.05 showed that the users have a positive opinion about the presence of adequate furniture for various activities in the studied area, however, the other three items were rejected by the respondents.

The respondents were asked to explain the annoying behaviors and activities they observed based on previous experience or the phenomenon they are faced with. They were also asked to orally explain so that their voice could be recorded for data extraction at the same time as the researcher was writing their words down. Table (7) presents the results of the categorization of the raw data extracted. It should be noted that due to the difference in annoying behaviors and activities from the users' point of view, the gender variable was also considered for these two questions.

Table 7. Frequency of Annoying Behaviors and Activities

Gender	Annoying Behaviors and Activities from Users' Point of View in Babolrood Riverside			Total
	Noise-Making Behaviors	Disturbance	Disturbance Interference of Behaviors	
Male	3	102	66	171
Female	1	90	62	153
Total	4	192	128	324
Weight Percentage	1.2	59.25	39.5	100

Gender	Annoying Activities from Users' Point of View in Babolrood Riverside				Total
	Bikes and Bicycles	Smoking	People Gathering	Camping	
Male	31	61	67	12	171
Female	37	48	57	11	153
Total	68	109	124	23	324
Weight Percentage	20.98	33.64	38.27	7.09	100

the respondents were asked which changes, at which level, and how they would have applied these changes in the studied area if had the option to do so. The answers of all respondents were collected and presented in Table (8) after categorization and classification.

Table 8. Frequency of Suggestions for Changes in Babolrood Riverside

Gender	Suggestion to Change Babolrood Riverside						Total
	Separating Pedestrian and Vehicle Paths	Removal of Sidewalk Interruptions	Rest Area	Reduction of Deserted Areas	Changing Existing Uses	Reconstruction	
Male	15	22	81	7	45	1	171
Female	20	19	71	7	35	1	153
Total	35	41	152	14	80	2	324
Weight Percentage	10.8	12.65	46.91	4.32	24.69	0.6	100

Table 9. Area of Interest Divided by Gender

Area / Gender	Area of Interest for Walking				Total
	Shora Park (Area No.1)	From Shora Park to the Cable Bridge (Area No.2)	From the First Bridge to the Cable Bridge (Area No.3)	From the Cable Bridge to the New Square (Area No.4)	
Male	26	53	67	25	171
Female	22	44	72	15	153
Total	48	97	139	40	324

In the following, in table (9), the area of interest of users to perform the activity is specified. Based on the information extracted from the questionnaires, the following points and results were obtained.

Among the facilities suggested by the audience to be added to this area are the amusement park, women's park, separate sidewalk, passage, commercial complex, motorcycle path, bookstore, cinema, rest areas, library, study areas, sports complex, etc. Each of the suggestions included several other options which were divided into some categories.

In the last two questions of the interview, the respondents were asked to provide their needs regarding the use and suggestions for the uses of the new building. Also, in another question, the respondents were asked to talk about the required use of the area as well as the type of structure and additional building from their own point of view and write in the answer. All questionnaires were collected, data was extracted and categorization was also used as summarized in table (10) (due to the increase and similarity of the concept, only some categories and items are given).

Table 10. Categorization of the Suggested Uses by the Users

Category (Component)	Data Extracted from the Interview (Item)	Category (Component)	Data Extracted from the Interview (Item)
Cultural	Study Area; Library; Bookstore; Cinema; Gallery; Opera; Theatre	Commercial	Passage; Bazaar; Organization of the Vendors; Food Court; Night Market
Service	Separating Pedestrian and Vehicle Paths; Vision and Landscape; Watching Space	Entertainment	Playground; Amusement Park; Women's Park; Extension of the Park; Sidewalk
Social	Rest Area Gathering Area Living Area	Sports	Football Court; Health Path; Skate area; Body-Fitness; Sports Furniture (Volleyball Net, Basketball Court, Tennis Court, etc.); Boat Area Improvement; Water Sports

Gender	Use Suggestions for Babolrood Riverside from the Users' Point of View				Total
	Entertainment-Leisure	Cultural	Gathering Space	Sports	
Male	42	35	65	29	171
Female	35	33	52	33	153
Total	77	68	117	62	324

6. CONCLUSION

Using the data obtained from the questionnaires and interviews with the users in the case study as well as the overall conclusion of the cases in the form of categories and items, some major cases can be considered as the users' preferences in this urban space. The most important factors extracted after the categorization of the items and components were: 1. noise, 2. disturbance, and 3. interference, respectively. The cases implied by the users were divided into some more general categories in a bottom-up view and after content analysis. In fact, the most basic cases the users paid attention to could be categorized into noise pollution, safety and security, spatial hierarchy, and pedestrian-orientedness categories. Figure (4) well shows the chart and trend of division.

Alongside interviews with the respondents and also based on the data obtained from the distributed questionnaires as well as the observations, the implementable suggestions for improvement of the case study space are presented in Table (11).

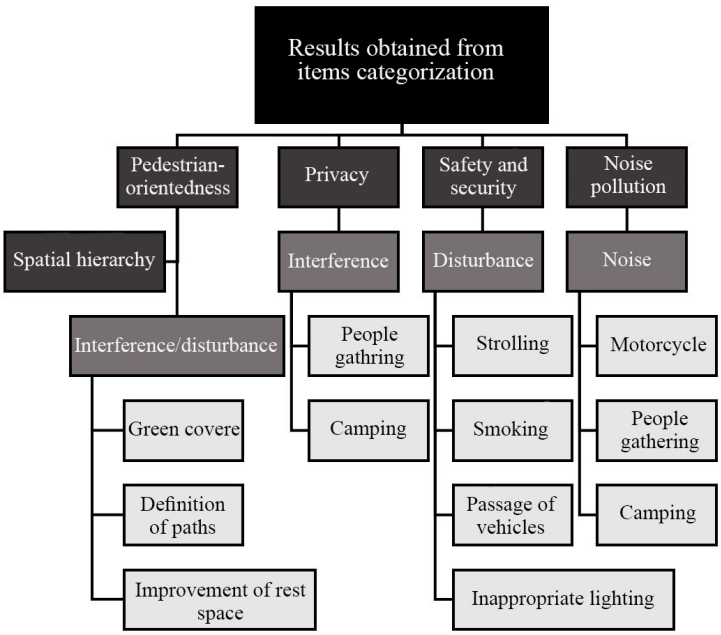

Fig. 4. Results obtained from finding categorization

Table 11. Categorization of the Problems and Provision of Suggestions

Component	Item (Annoying Behaviors)	Administrative Suggestions to Improve the Space
Interference	People Gathering Camping	- Changing the existing uses such as canteens and cafes in spaces where the audience is families/reducing deserted areas by increasing lighting and creating social surveillance, especially in the park area and bridge underpass - Increasing rest spaces with more privacy for temporary accommodation/ increasing welfare services
Disturbance	Strolling Smoking Passage of Motorcycles and Bicycles	- Reconstruction of some existing uses - Reducing deserted spaces by changing some uses to increase social surveillance - Separation of pedestrian and vehicle paths/removal of sidewalk interruptions
Noise	Motorcycles People Gathering Camping	Separation of pedestrian and vehicle paths in the form of health sidewalks and bicycle paths/preventing motorcycles from entering through barriers/increasing furniture and rest areas

In addition to the abovementioned, it should be noted that the most important preferences of the users of the case study (Babolrood sidewalk in Babolsar) were walking and facilities related to walking (including the pavement, furniture, and green cover (the recorded observations and reports also validate this matter). Also, it was observed that inappropriate lighting, especially during the night, is one of the important and influential factors in users' view of the space. As was mentioned in the findings in tables 6 and 9, the preferred time of users to use the case study was the 20-21 interval during the first half of the year, and 18-19 during the second half of it. This interval and information were also confirmed by the observations.

In addition to the mentioned cases, the most important executive solutions in the field of macro-planning can be considered with zoning activities, ensuring safety, improving the sense of security by increasing visual communication, and redefining access as features of urban spaces under the preferences of users in the study area.

The results obtained in the present study are in line with the results of Lak and Ramezani (2018) who considered pollution, safety, and security as the most influential cases on urban space preferences. Also, the results obtained by Nazarpour et al., (2018) are similar to the results of the present study.

ENDNOTE

1. Refer to Naderifar, Mahin, Hamideh Goli, and Fereshteh Ghaljaie. 2017. "Snowball Sampling: A Purposeful Method of Sampling in Qualitative Research". Journal of Strides in Development of Medical Education 14(3): 171-179.

REFERENCES

- Abbaszadeh, Shahab, and Souda Tamri. 2012. Analysis of Factors Affecting the Improvement of Pedestrian Walkway Spatial Quality and Pedestrian-Oriented Spaces, in Order to Increase the Social Interactions Level of People (The Case Study: Tarbiat & Valiasr Axis, Tabriz Metropolitan). *Urban Studies* 1(4): 95-104. https://journals.uok.ac.ir/article_3668.html
- Atashin Bar, Mohammad. 2009. Continuity of identity in the urban landscape. *Bagh-e Nazar* 6(12): 45-56. http://www.bagh-sj.com/article_32.html?lang=en
- Azadkhani, Pakzad, Ali Jasemi, and Younes Azadi. 2015. Investigation and analysis of citizens' satisfaction with the quality of the urban environment (case study: Eiwan city). *Geography and Environmental Studies* 4(16): 35-48.
- Birenboim, Amit, Martin Dijst, Dick Ettema, Joost de Kruijf, Geert de Leeuw, and Nico Dogterom. 2019. The utilization of immersive virtual environments for the investigation of environmental preferences. *Landscape and Urban Planning* 189: 129-138. https://doi.org/10.1016/j.landurbplan.2019.04.011
- Carmona, Matthew, Nick Gallent, and Reetuparna Sarkar. 2010. *Space standards: the benefits*. CABE: London, UK .
- Cassarino, Marica, Eleanor Bantry-White, and Annalisa Setti. 2019. Cognitive and sensory dimensions of older people's preferences of outdoor spaces for walking: A survey study in Ireland. *International journal of environmental research and public health* 16(8): 1340. https://www.mdpi.com/16601340/8/16/4601-
- Dadashi, Mehdi, Mansour Sepehri Moghadam, and Hossein Zabihi. 2018. Investigating residents' perceptions, experiences and preferences in order to improve performance in buildings with an environmental approach. *Urban Management* 17(50): 181-197. https://www.sid.ir/paper/91916/fa
- D'Acci, Luca. 2019. Aesthetical cognitive perceptions of urban street form. Pedestrian preferences towards straight or curvy route shapes. *Journal of Urban Design* 2(6): 896-912. https://www.tandfonline.com/doi/full/10.108013/574809.2018.1554994
- Farsi, Tayebeh, Shahriar Nasekhian, and Ahmad Shahiwandi. 2019. Post Utilization Evaluation of Urban Hangouts to Analyze Its Effects on Vivacity Development (A Case Study of Urban Hangout in Natural Historic Pathway of Isfahan). *Amish Environment* 12(47): 145-162. https://ebtp.malayer.iau.ir/article_671726.html
- Golrokh, Shamin. 2019. The Application of Environmental Preferences Criteria in Public Space Assessment, with an Emphasis on the Sense of Place. *Soffeh* 29(2): 77-94. https://soffeh.sbu.ac.ir/article_100466.html
- Handy, Susan L., Marlon G. Boarnet, Reid Ewing, and Richard E. Killingsworth. 2002. How the built environment affects physical activity: views from urban planning. *American journal of preventive medicine* 23(2): 64-73. https://www.sciencedirect.com/science/article/abs/pii/S0749379702004750
- Herzog, Thomas R. 1992. A cognitive analysis of preference for urban spaces. *Journal of environmental psychology* 12(3):237-248.https://www.sciencedirect.com/science/article/abs/pii/S0272494405801380
- Herzog, Thomas, and Gregory A. Smith. 1988. Danger, mystery, and environmental preference. *Environment and Behavior* 20(3): 320-344. https://journals.sagepub.com/doi/abs/10.1177001391658820300 4/
- Im, Seung-Bin. 1984. Visual preferences in enclosed urban spaces: An exploration of a scientific approach to environmental design. *Environment and Behavior* 16(2): 235-262. https://doi.org/10.1177001391658416 2005/
- Kaplan, Stephen. 1987. Aesthetics, affect, and cognition: Environmental preference from an evolutionary perspective. *Environment and behavior* 19(1): 3-32. https://doi.org/10.1177001391658719 1001/
- Khaleghimoghaddam, Navid. 2016. Assessment of Satisfaction and Environmental Preferences of Students. *ICONARP International Journal of Architecture and Planning* 4(2): 96-107. https://doi.org/10.15320/ICONARP.2016.12
- Lak, Azadeh, and Mina Ramezani. 2018. PUsers' Preferences for Designing Spaces under Urban Bridges as Vital Urban Spaces. *Arman Shahr Architecture and Urbanism* 11(23): 225-235. http://www.armanshahrjournal.com/article_69692.html.
- Lu, Ming, and Jingwan Fu. 2019. Attention restoration space on a university campus: exploring restorative campus design based on environmental preferences of students. *International journal of Environmental research and public health* 16(14): 2629. https://doi.org/10.3390/ijerph16142629
- Mamaghani, Nasser Koleini, Azadeh Parvandar Asadollahi, and Seyed-Reza Mortezaei. 2015. Designing for improving social relationship with interaction design approach. *Procedia-Social and Behavioral Sciences* 201: 377-385. https://doi.org/10.1016/j.sbspro.2015.08.190
- Mansouri, Seyyed Amir. 2009. Income/ urban landscape, a comprehensive narrative of the city. *Manzar* 1(3): 4. http://www.manzar-sj.com/article_249.html
- Mirzaei, Shokoufeh, Siavash Teimouri, and Saeideh Nejad Sattari. 2012. Sense of place and Identity creation (Case Study: Bazaar Kermanshah). *National Studies Quarterly* 13(50): 121-141. http://rjnsq.sinaweb.net/article_99155.html?lang=en

- Mohammadian, Mehrdad, and Darya Goharmotahar. 2018. Investigating the relationship between the quality of the urban environment and the social relations of the citizens of the municipal Region 1 of Tabriz. *Urban Sociological Studies* 8(26): 191-222. https://urb.dehaghan.iau.ir/article_660877.html
- Nazarpour, Mohammad Taghi, Ahmad Heidari, and Marzieh Salimi. 2018. The Effect of Spatial Configuration of Student Dormitories on the Students' Space Preferences. *Armanshahr Architecture and Urbanization* 11(25): 209-223. http://www.armanshahrjournal.com/article_85096.html
- Neghabi, Mahboubeh. 2014. Evaluating the effectiveness of behavioral camps designed in the Botanical Park of Tabriz University. *International Conference of Niaresh Shahr Paya, Tehran*. https://civilica.com/doc/344559
- Pirbabaei, Mohammad Taqi, Leila Medqalchi, and Ali Niknama. 2016. Design principles of riverside green paths. *The second international conference on man, architecture, civil engineering, and the city, East Azerbaijan*. https://civilica.com/doc/656958.
- Pirbabaei, Mohammad Taqi, and Hassan Sajjadzadeh. 2011. Group Belonging to Place, Realization of Social Residence, in Traditional Neighborhood. *Bagh-e Nazar* 8(16): 17-28. http://www.bagh-sj.com/article_2.html.
- Rabei, Kamran, and Tahereh Shariat Manesh. 2020. Hangouts and the Social Production of Space: A Phenomenological Study of Everyday Life in Isfahan Women's Hangouts. *Women in Development and Politics* 18(2): 263-292. https://jwdp.ut.ac.ir/article_78679.html
- Rafiyan, Mojtabi, and Zahra Askarizadeh. 2009. Investigating factors affecting the quality of the urban environment. *Urban Management Studies* 1(3): 119-134. https://ums.srbiau.ac.ir/article_4744.html.
- Rasouli, Sara, and Samira Rahim Dokht Khorram. 2009. Creating a favorable urban landscape on footpaths. *Arman Shahr Architecture and Urbanization* 2(3): 103-112. http://www.armanshahrjournal.com/article_32603.html
- Razaghi, Habibullah. 2013. Quality Analysis of Urban Space, landscape and the Behavior User Method of Users (Case Study: karaj Edge Stream). *Geographical Research* 28(111): 95-112. https://www.sid.ir/paper/29812/fa
- Rezaei, Nahideh, Rahmat Mohammadzadeh, and Ali Omranipour. 2016. The Evaluation of Social Quality of Open and Semi Open Communication Pathways at University of Kashan's Campus. *Iranian Architectural Studies* 5(10): 183-206. https://www.sid.ir/paper/219503/fa
- Roradeh, Hemmatollah. 2016. Investigation of coastal tourism from a climatic point of view. *Geography Quarterly* 14(49): 209-223. https://www.sid.ir/paper/150211/fa
- Sashvarpour, Mehdi, and Mehdi Elyasi. 2015. Waterfront urban design with a sustainable development approach (case study: Mahabad River). *City Landscape Research* 2(4): 19-33. magiran.com/p1499217
- Sayafzadeh, Alireza, Mohammad Miraei, and Morteza Farahani Nodeh. 2013. The role of urban landscape quality in creating social life and spatial identity of citizens (case study: Nawab Highway). *Iranian Islamic City Studies* (11): 29-39. https://www.sid.ir/paper/492620/fa
- Shakri Eski, Shokouh, and Sanaz Litkohi. 2014. Cultural differences, an influencing factor on students' environmental preferences regarding the dormitory space (Case study: Iran and Cyprus). *Architecture and Urban Planning of Iran (JIAU)* 5(8): 1-11. doi: 10.30475/isau.2015.61992
- Sood, Tapeesh, Patrick Janssen, and Clayton Miller. 2020. Spacematch: Using environmental preferences to match occupants to suitable activity-based workspaces. *Frontiers in Built Environment* 6: 113. https://doi.org/10.3389/fbuil.2020.00113
- Tavakkolian Ferdowsieh, Maryam, Najma Ismailpour, and Mohammadreza Noqsan Mohammadi. 2016. Redesigning Bazaar, Based on Its Collective Memories Formation and Retention Case Study: Bazaar Khan, City of Yazd. *Bagh-e Nazar* 13(39): 45-56. http://www.bagh-sj.com/article_14941.html?lang=en
- Tavallaei, Novin. 2003. Urban space and socio-cultural relations. *Cultural Research Journal* 7(5): 109-140. https://www.sid.ir/paper/483497/fa
- Valizadeh, Negar, and Alireza Andalib. 2017. Designing the public arena with emphasis on the relationship between activity patterns and design features (case study: Persian Gulf Shohada Lake area, District No.22, Tehran). *International conference on civil engineering, architecture and urban planning of contemporary Iran, Tehran*. https://civilica.com/doc/710053.
- Wang, Ronghua, Jingwei Zhao, Michael J. Meitner, Yue Hu, and Xiaolin Xu. 2019. Characteristics of urban green spaces in relation to aesthetic preference and stress recovery." *Urban Forestry & Urban Greening* 41: 6-13. https://doi.org/10.1016/j.ufug.2019.03.005

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