

Original Research Article

Post-Phenomenological Analysis of the Effect of Sense of Time on the Index of Sociability of Public Open Spaces (A Case Study of KoohSangi Square in Mashhad)*

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Abstract | A large part of people's social life takes place in public spaces where people's social interactions are defined. Therefore, sociability is considered one of the most important qualities of public spaces. For a comprehensive and efficient study of the nature of public spaces, it is necessary to examine this nature in different time frames. A post-phenomenological approach helps to define the sense of place in relation to the sense of time. This approach examines public spaces as an event that opens themselves to changes and are formed simultaneously with dynamic activities. In this regard, the purpose of this research is to analyze a correlation between the time factor and the level of sociability indicators of public spaces affected by the time factor with a post-phenomenological approach and to investigate how the sociability factors are related to daily and annual time cycles, quantitatively and qualitatively. This study employs a mixed methods descriptive-analytical approach. This study focuses on the environment, behavior, analysis, and evaluation of the place and policies and programs using a case study in KoohSangi Square of Mashhad. Data was collected using documentary studies, closed-ended questionnaires, semi-structured in-depth interviews, and intermittent observations, and analyzed using analogical, content, graphics and Depthmap 1, and SSPS software. The findings show that the degree of influence of indicators in promoting the sociability of public spaces is strongly influenced by the time factor. This means that most of the indicators have been very successful in attracting people to the space in some specific periods. While this is not the case in other periods their effects are greatly reduced. Coordinating and assimilating indicators with the needs of the audience in different time frames has a great impact on the social-spatial function of public spaces and improving their sociability and the physical-spatial characteristics related to the sociability indicators of the space in different time cycles are in accordance with the desired and usual behavior patterns of the users and at the highest level of integration, form, space, function and time are a suitable ground for the occurrence of cultural events or the physical representation of collective values and norms.

Keywords | *Sense of time, Time cycles, Post phenomenology, Sociability, Public open spaces.*

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Introduction Among the types of spaces, public spaces are important both with regard to the platform of social activities that they create and because a large part of the daily life and collective life of people is spent in them, and these spaces provide a platform for social interactions and diverse activities of people. Lack of attention to factors such as audience behavior, communication, history and cultural background, social structures, and time on the one hand, and considering the place as an isolated and static nature, on the other hand, has caused problems in the design process of public spaces and has reduced the level of sociability of such spaces. Sociable areas encourage and motivate social and collective behaviors, and social-avoidance environments reduce social development. The public space is an open and accessible space for everyone, where people can meet and interact with different people and participate in the formation of a connected and interactive human process of communication experience including presence, seeing and hearing each other (Abarghouei Fard, Motalebi & Mansouri, 2023, 40). Therefore, the need to address the issue of sociability of public spaces are: Promoting social interactions among citizens, promoting the sense of the presence of citizens in different urban areas, promoting the sense of belonging of people to spaces, consolidating the role of public spaces in different scales and preventing the decrease of people's presence in these spaces. Place is not static and includes dynamic activities which are formed in, but it is formed simultaneously with those dynamic activities, and the real sense of place is defined in this way (Dovey, 2015, 56). Looking at the background of the concept of time in urban design literature It can be seen that there is practically an abstract approach to this concept in urban design research, as the fourth dimension of urban space; While the extensive literature related to the concepts of perception and environmental psychology in daily life is neglected. It is a subject that strongly influences the audience's perception of its surrounding environment, and defining a quality for a place, such as the quality of sociability, without considering the dimension of time, will be deficient. Therefore, post-phenomenological analysis with regard to a dynamic and comprehensive view, focusing on the main users and audiences of public spaces and considering the time factor can be a way forward. In this approach, contrary to the phenomenological approach, spaces are examined as dynamic natures that show different potentials and characteristics in different time frames; Therefore, the purpose of the research is to explain the sociability indicators of public spaces related to the sense of time analyzed the correlation between time cycles and the level of sociability indicators of public spaces and examine how the sociability indicators relate to daily and

annual time cycles, quantitatively and qualitatively. In this regard, the research questions are as follows:

- 1- What are the sociability indicators of public spaces related to the sense of time?
- 2- What is the relationship between different time cycles and the level of sociability indicators of public spaces?
- 3- Which of the indicators of sociability change in different time cycles and which have the most changes?

Based on the mentioned cases, a research hypothesis is defined in such a way that there is a significant relationship between the sociability indicators specified based on the time factor in public spaces and the degree of sociability of these spaces.

Literature Review

The current research consists of three main concepts of sociability, sense of time, and public space, each of which has been the subject of numerous research. Regarding the public space, there have been countless studies, many of which have investigated the positive features of public spaces (Vivant, 2018; Duivenvoorden, Hartmann, Brinkhuijsen & Hesselmanns, 2021; Motomura et al., 2022). For example, Mohaghegpour in his article on the effect of these spaces in the field refers to creating a space for collective memories, highlighting civil life, spending leisure time, etc (Mohaghegpour & Zamanian, 2022) and also the superpower of the individuals considers the public space as a necessary arena that provides opportunities for individuals and communities to develop and enrich their lives (Abarghouei Fard, Motalebi & Mansouri, 2023). Some have analyzed the complexities of human relationships with such spaces (Kaghazlou, Ladan Moghadam & Akbari, 2019; Ji & Ding, 2021; Vazquez & Alvarado, 2022). As a result of this research, researchers consider sociability and social characteristics as the basic factors in public spaces (Saraf Moayeri & Soheyli, 2022). Among them, a study conducted by Bahrami in 2010 attempted to make a correct generalization about the quality and organization of the public spaces of the society based on the correct knowledge of the effective factors in the "belief-behavior-form" system. (Bahrami, 2010) by examining the selected samples in Sanandaj. Some researchers have also specifically investigated ideal and responsive public spaces in the conditions of pandemics such as Corona (Hassan & Meghdad, 2021). Some researchers have also specifically explained the indicators of sociability in architectural functions; Neighborhood center (Ghazipour, 2017), Forest Park (Mahmoudi, Sorouri, Zenner & Mafi-Gholami, 2022), Urban Park (Ravanbakhsh & Mirabadi, 2017), bazaar (Najari Nabi & Mahdinejad, 2019) and residential complex (Borhanifar, Mazhari, Taghvayi, Vasigh & Ashrafzadeh, 2020), urban square (Safari & Moridani, 2017); Or they have

specifically investigated some indicators such as lighting and security (Meshkini, Kamangar & Golchoubi Diva, 2020) and vitality (Khorasanizadeh, Saberi, Momeni & Mousavi, 2019) in such spaces. Fig. 1 shows the summation of sociability indicators of urban spaces which are extracted from the literature related to the topic. On the other hand, the concept of time has been investigated by researchers such as (Ahmadnejad, 2019) especially in architecture along with concepts such as movement and Sabouhi in his research deeply examines the relationship between man, place, and time (Sabouhi, Massoud & Moradi Chadegani, 2018). In the field of urban studies, few researchers have dealt with the rhythms and time cycles in urban spaces and their effects (Koch & Sand, 2010; Wunderlich, 2008). They have investigated different dimensions and aspects of sociability in public spaces, and in particular, this field of study has been less investigated based on different time rhythms, especially with comprehensive philosophical approaches such as post-phenomenology.

Theoretical Framework of the Study

• The concept of sense of time

In the traditional view, although the place looks three-dimensional and the design has three dimensions, the fourth dimension time is effective in the design of the place (Carmona, Tisdell & Heath, 2008, 356). The sense of time is related to concepts such as time perception or time

experience. A person's sense of time is an inner feeling and experience, and measured time (clock time) is one hour.

It is an external framework for communication and work. In other words, the sense of time, like the sense of place, is an internal and personal experience of time perception (Souri, Razaghi Asl & Feyzi, 2012, 76). This perception is related to various factors. For example, the sense of time depends on the perception of changes and events in time. That is, as we understand phenomena and events, we also feel the time of their occurrence. Recognition and benchmarking always occur in the context of time in the city and urban spaces, and space and time can be considered as indicators that help to evaluate urban places (Goudarzi, Behzadfar & Ziari, 2020, 115).

• Time rhythms

Rhythm is a concept that can be perceived as an objective expression of time in the urban space. From a physical and psychological point of view, rhythm is abstractly defined as a regular event (occurring at certain time intervals) as a movement with a regular sequence of weak and strong elements, or as a cycle of repeat measurement and movement are the three main characteristics of rhythms and time cycles. Rhythms determine the relationship between population, space, and time. This repetitive unit can include different expressive movements of sensory, visual, audio, and olfactory types that are repeated regularly or irregularly and eventually combine or conflict (Mareggi, 2012, 4). Analyzing

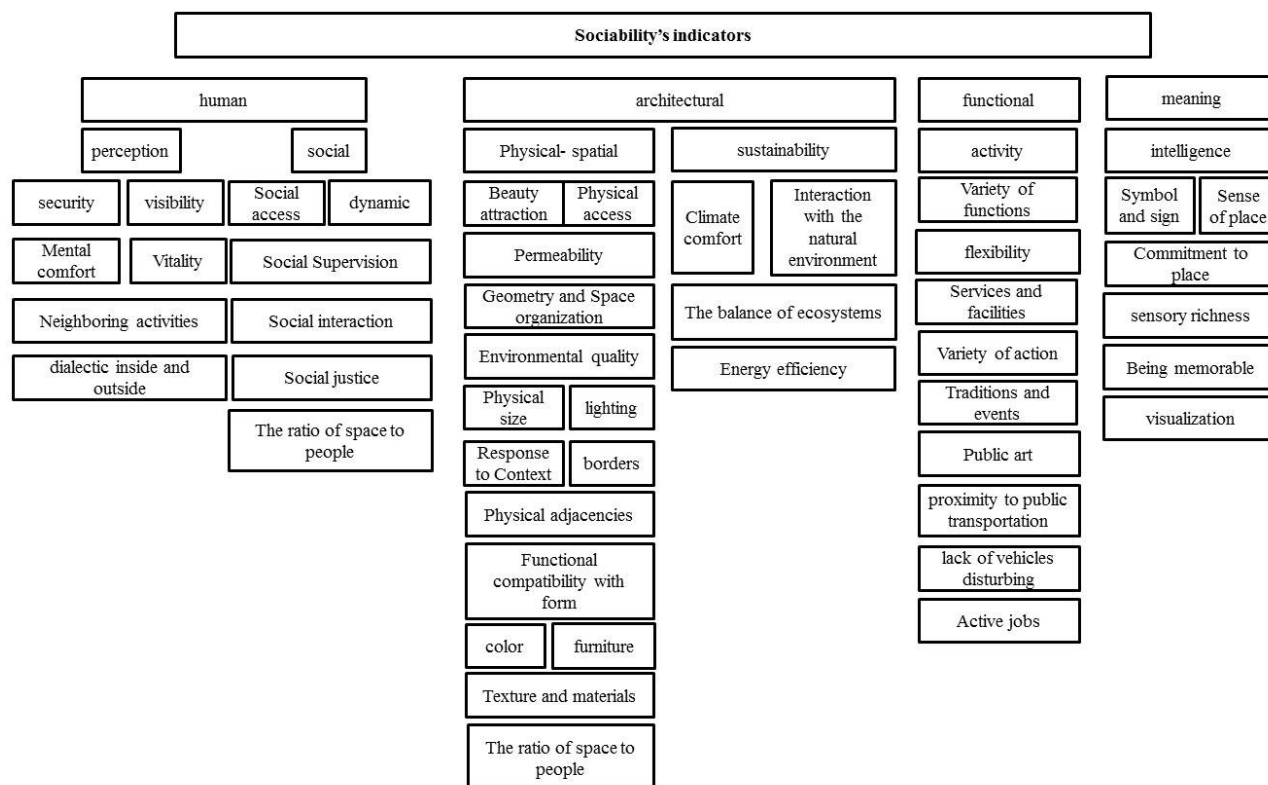


Fig. 1. Sociability indicators of urban spaces based on the literature review related to the topic. Sources: Authors.

time cycles in urban spaces can help designers improve the quality of urban spaces according to the needs of the user group with a complete and comprehensive understanding of the current situation, with minimal physical intervention and providing solutions for physical planning in the future. get from the environment.

• Post phenomenology in space

To describe the temporal-spatial life cycles of different people living in the same territory, it is necessary to get closer to people and things. Examining a space, only through aerial maps or 3D perspectives, is not enough to record the rhythms, flows, movements, and perspectives of the space in different sequences, instead, it can be useful to examine the different perceptions of people who interact with the space every day (Henckel et al., 2013, 24). Therefore, the studies of urban spaces will not be complete without considering time issues, and the phenomenological analysis of place, without considering time cycles, cannot be a true reflection of people's lived experiences. The post-phenomenological approach seeks knowledge that does not have a static nature and considers the influence of time along with other dimensions. Since in this research, the quality of sociability of public spaces is examined in different time cycles, this approach has been used for a more detailed analysis of the issue. In the post-phenomenological approach, dynamics and social structures are examined in a more complete way than the phenomenological approach. In this view, a place is an event that is alive and opens itself to changes, and is formed simultaneously with dynamic activities (Talebian & Uraz, 2018).

Research Methodology

This research is a mixed methods (quantitative-qualitative) with a dominant post-phenomenological approach, in which the effectiveness of public spaces is investigated and interpreted from the perspective of the relationship of behavioral patterns, mental beliefs, and physical patterns with different time cycles. As a result, the correlational research method is a comparative causal type, which is a combination of ethnography and content analysis using a case study. At first, the indicators of improving the sociability of public spaces were compiled and categorized based on documentary studies and literature review related to the subject. In this questionnaire, the impact of each of the indicators of the sociability of public spaces in different daily and annual time cycles was formulated as items that measure attitudes. It was done using a Likert scale. The respondent indicates his level of agreement with each of the items on a graded scale of one to five. Then the subject's answer to each of the items is numerically valued. To test the validity of the questionnaire, first, the initial draft of the questionnaire was sent to 10 experts. After reaching a collective agreement

on the items, the questionnaire was sent to the experts in the form of an electronic questionnaire. At this stage, the questionnaire was sent to relevant field experts, including managers, urban planners and designers, and architects who specialize in the field of social sustainability, interactions in urban bodies, and the sociability of these spaces. The statistical community at this stage includes experts in the field. It is an urban design that specializes in the field of public spaces and the number of people was estimated to be around 100. Based on Cochran's formula with an error value of 0.05, the sample size is 79 people, and the response was done without considering a random sample of the research. The reliability of questionnaires at this stage using Cronbach's alpha method and by SPSS software was investigated, and the alpha value of 0.936 was obtained and confirmed the reliability of the questionnaire at an excellent level. Based on the obtained results, the first quartile of indicators that had the highest weighted average were selected as sociability indicators that have the most changes in different periods, so that the field process of the research could be investigated. Also, case sample modeling was done by Depthmap software, and the data collected through observations was compared with the outputs of this software to increase the validity of the results (Fig. 2). Finally, to measure the effect of each indicator of sociability in different periods on the sociability of the space under the influence of the time factor, questionnaires were distributed among the users of the space to be rated on the final indicators. The statistical population in this second part, the addressees of this square included residents, passers-by, and travelers, and due to the unknown number of the statistical population, based on Cochran's formula, the sample size was 384 people, and the validity and reliability of the questionnaires in this part were respectively measured using Delphi method and Cronbach's alpha method (0.83, good reliability). In the questionnaires of this section, the respondents were asked to rate a score of 1 to 5 according to the impact of each index on their presence in the space, in different annual and daily time cycles. Data and observations were gathered on two non-closed days and one closed day (Friday) and in summer, spring, autumn, and winter in 2018 and 2019 and from 8: 00 am to 12: 00 pm in four 4-hour time slots (8: 00 am to 12: 00 am, 12 to 4 in the afternoon, 4 to 8 in the evening and 8 to midnight). The frequency and weights of data rated on each index in each time cycle were quantified and analyzed by SPSS software Fig. 3 shows the research process.

Findings

• Physical-spatial characteristics of the case sample

KoohSangi Square is located in the eighth area of Mashhad and on the eastern side of KoohSangi Park, and it is the gate that is famous for entering this park. Koohsangi Park

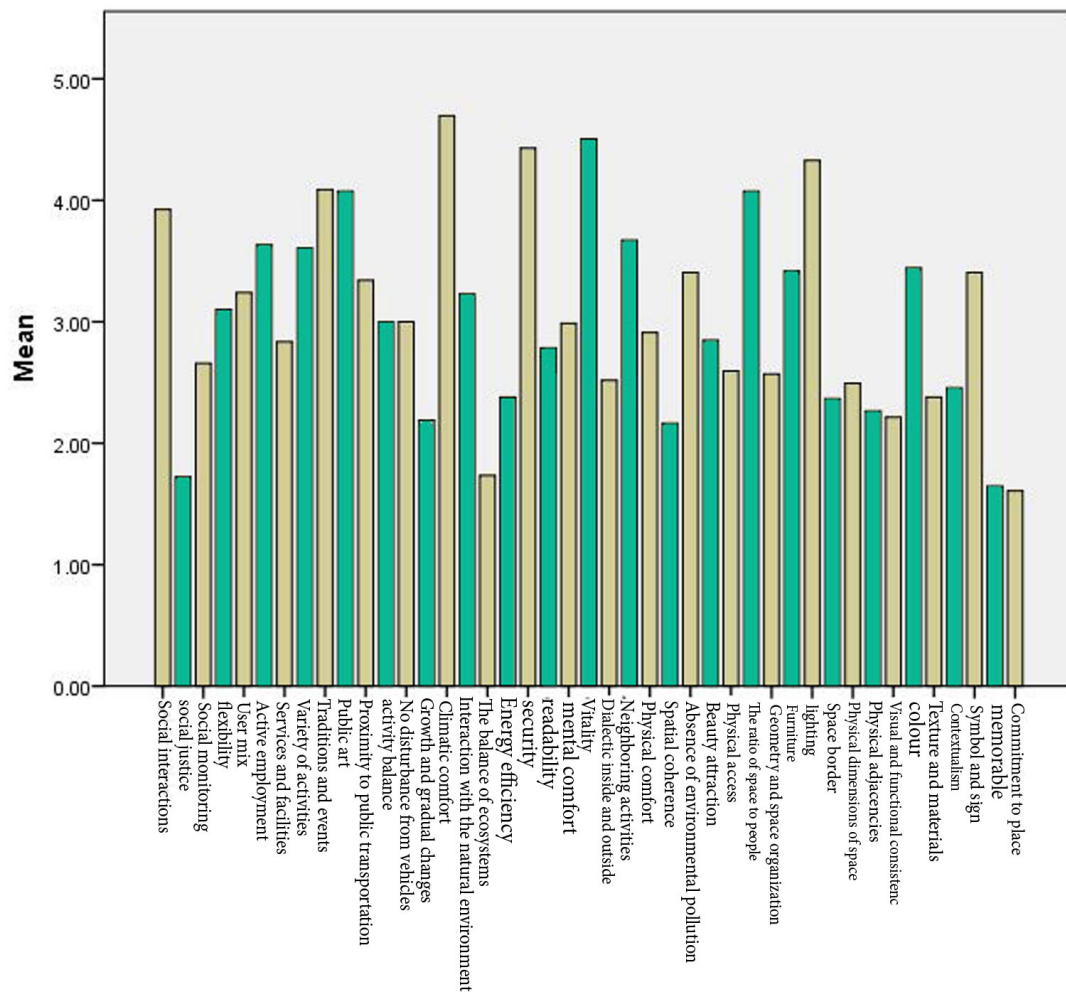


Fig . 2. The frequency of experts' scores regarding the influence of sociability indicators in different time cycles of SPSS output. Source: Authors.

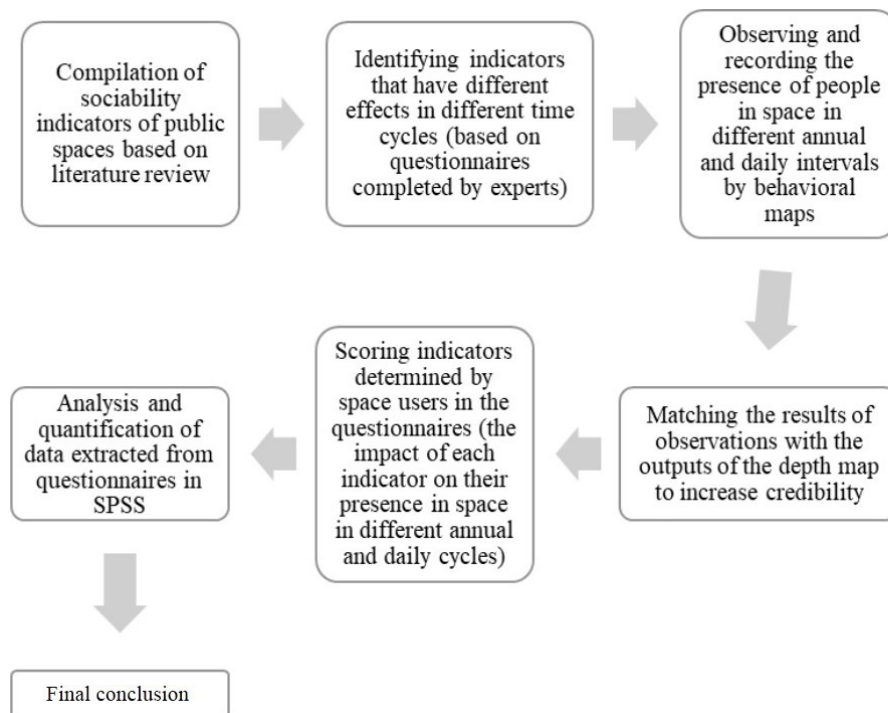


Fig. 3. The process of doing research. Source: Authors.

of Mashhad is one of the old parks of the city, which many people dedicate a few hours to go to because of its fresh air and beautiful scenery. This square reaches KoohSangi street from the east, which is the end point of this important street. Mehr commercial-residential tower is located in the north of the square, and its western wall is one of the most important entrances to KoohSangi Park. In the southern part of the square, a commercial-administrative tower is also under construction (Figs. 4 & 5). Except for the western side, the other three sides of the square do not have a passageway for vehicles, and this issue has increased the feeling of peace in the square.

• Movement and navigation

To check the movement and navigation situation in a case study, the condition of the paths, the degree of readability 2 or the spatial integration and integration 3 were analyzed by the Depthmap software and then the soft output was matched with the perceived state of navigation by observations in space. In the analysis of the software, a stopping point for the passerby, the main entrances of each block has been considered due to the heavy crowding and the first encounter of the audience with the space. These points are marked with white arrows in picture number 6. As shown in the readability graph of Koohsangi Square (Fig. 6), the eastern areas of the square have more spatial readability due to the absence of volumes and vertical elements. Readability, this section, which is the main entrance of the square from the side of Koohsangi Street, has had a great effect on attracting people to the space. The west side of the square, which is the second most important entrance to the square from the side of Koohsangi Park, has a high readability and this has also attracted people from the side of the park to the square. On the other hand, considering that this space is considered to be the most important and densest place for pause and sitting in the square, spatial legibility in this part has increased people's feeling of relaxation in using the space. Therefore, the compatibility of the readability graph and the connection graph of the Depthmap software show that the organization of the body of the space is compatible with the movement and activity system of the space in different time cycles and has a connection, which has promoted the sociability of this space; however, how the value of connection is dispersed in the public space of Koohsangi Square is not correlated with the needs of the users in it.

• Analytical data and their ratio with daily and annual time cycles

In this part, the indicators of improving the sociability of public spaces, which have the most changes in different time cycles (extracted from the questionnaires of the first part of the research), in different daily and annual time frames, are examined in the research case sample. For this purpose,

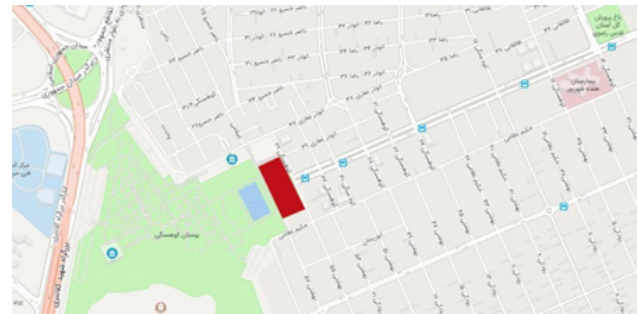


Fig. 4. The location of Koohsangi field. Source: Authors.



Fig. 5. Land use around Koohsangi Square. Source: Authors.

by using open-ended questionnaires, the visitors to the space were asked to give points from 1 to 5 according to the impact of each indicator in each specific period during their presence in the space. An important point in this section is that the time studies in this research are defined in such a way that for all analyses for daily periods, daily periods in the busiest season of the year (summer), and for annual periods, annual periods in the busiest The daily interval (afternoon) is considered. These weights are quantified for daily and yearly periods and are analyzed in separate graphs. Finally, the main hypothesis of the research is measured as the amount of changes of each index in different periods in the corresponding graphs (Figs. 7-9).

• Gender

According to the correlation analysis done by the SPSS software, the gender of people has no significant relationship with the hours of use per day ($\text{sig}=0.01$ and

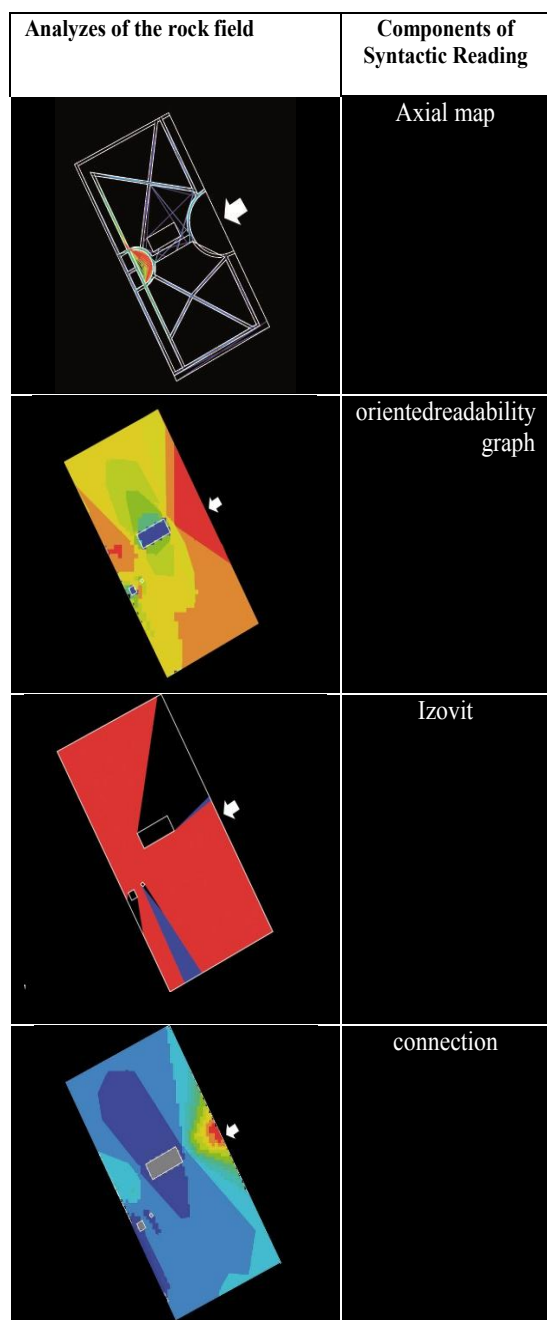


Fig. 6. Axis map, readability graph, isovit 4 and correlation in Koohsangi field, Depthmap output, scale: 1.5000. Source: Authors.

Pearson correlation = -0.202); But the gender of people has a significant relationship with the annual periods (sig=0. 01 and Pearson correlation=0.171). The observations indicate that the way of using the space and the way of valuing it has significant differences between male and female users in different periods (Figs. 8 & 9). In the daily period of the evening and the annual period of spring, when the number of female users is the highest, even in spaces where female users do not include the majority of users, their group gathering in public spaces and the way they use them, which is usually in the space They sit and talk to each other, it has a

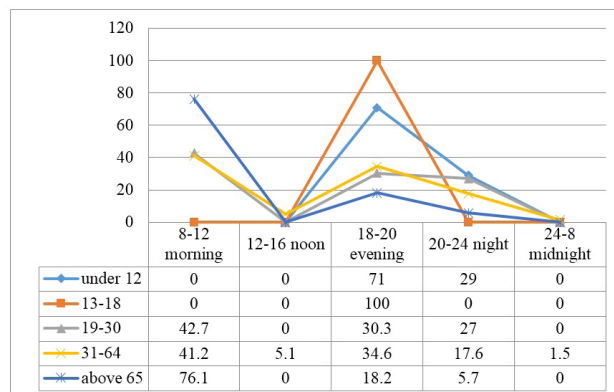


Fig. 7. Relationship between the age groups of Koohsangi field users with daily time cycles. Source: Authors.

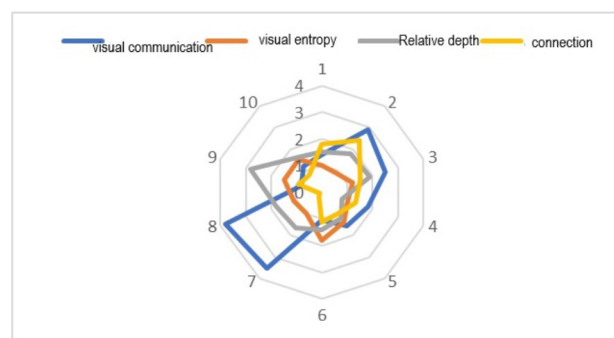


Fig. 8. The relationship between the four components of correlation, relative depth, visual entropy, and the visual relationship of the rocky field with annual time cycles. Source: Authors.

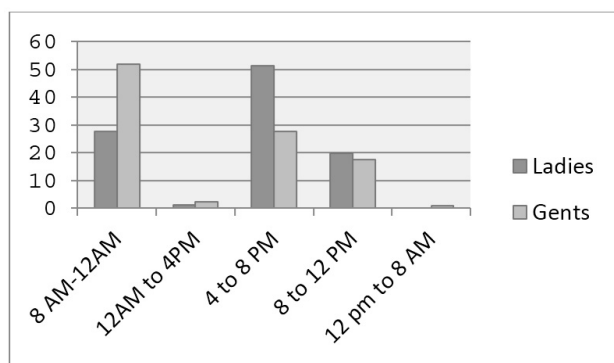


Fig. 9. The relationship between the gender of field users and daily time cycles in Koohsangi field. Source: Authors.

definite effect on the behavioral patterns and mental patterns of other users. The attractive force with the same gender also has the repulsive force of people of different genders because male users pass through the space by keeping a distance from the female community. In quieter or darker periods, unlike male lone users who choose other components such as physical comfort, quietness of sight and a suitable view for sitting, the security index is extremely important for female users and they are more crowded and bright places. they choose to pause in busier periods (evenings and spring and summer), male users tend to relax in the space, watch

events, and sightseeing more than female users. This is because female users are more inclined to talk in space and interact with others while watching and controlling events. The presence of male users in the space compared to female users has a greater effect than the adjacent users in quieter periods. In this period, due to the large number of male users in the space, the female users have a shorter duration in the space and pass through the space at a faster speed. Location selections of male users in different time frames may not have a clear definition and spatial limits; Such as grass surfaces, cozy corners or spaces between trees. If female users choose physically defined spaces for pause. The effect of sociability indicators on the sociability of space in different time frames can be seen in Table 1 and Fig. 10 which are the results obtained from the questionnaires along with the final weights. These tables specify how the users of each space have rated the impact of each index on sociability in different daily and annual time frames. The frequency of each segment by SPSS has been analyzed, and the overall weight and the weighted average have been calculated for each index in each period.

Security: The weighted average of this index is one of the highest values in daily time cycles, in the evening period (4.43). In annual time cycles, it has the lowest values in autumn and winter (2.76 and 1.66 in autumn and winter, respectively).

lighting: The weighted average of this index in daily time cycles is one of the highest values in the night period (4.20);

But in the noon period, the weighted average of this index is 1. The weight of this index is the lowest in spring and summer in annual cycles (2 and 1 in spring and summer, respectively).

The lighting conditions in Koohsangi Square are only limited to the brightness of the square. Of course, this indicator will be unaffected during the periods when it is possible to use natural light in the space; But in the hours of darkness, improving the quality of this index can help improve the visual quality of the environment by increasing the beauty of the space, in addition to improving the feeling of security and legibility in the space as one of the most important factors for all age groups in using the space.

Traditions and events: The weighted average of this index in daily time cycles is in the range of the lowest values (1).

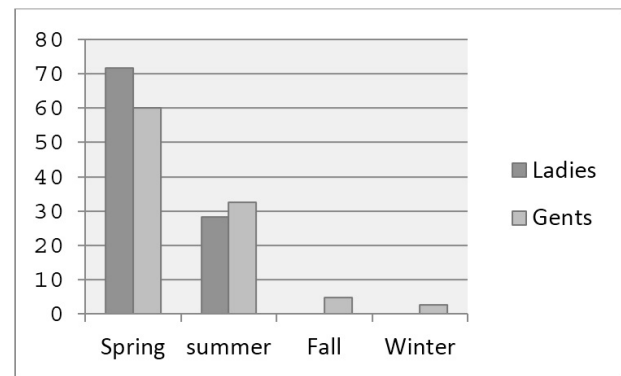


Fig. 10. Relationship between gender of field users and annual time cycles in Koohsangi field. Source: Authors.

Table 1. Weights extracted from questionnaires for the impact of sociability indicators on the presence of people in the space in annual and daily time frames. Source: Authors.

Sociability promotion indicators	Weighted average in daily cycles				Weighted average of annual cycles				Variance in daily cycles	Standard deviation in daily cycles	Variance in annual cycles	Standard deviation in annual cycles
	Morning	Noon	Evening	Night	Spring	Summer	Fall	Winter				
Vitality	3.48	70.1	59.4	3.37	4.47	66.4	90.2	86.1	1.06	1.03	33.1	1.15
Security	4.50	76.1	4.43	76.1	4.30	26.4	76.2	66.1	82/1	35.1	22.1	1.1
Lighting	1	1	3	20.4	4.30	26.4	76.2	66.1	87/1	46.1	22.1	1.1
Traditions and events	56.1	1	50.2	73.1	76.2	96.2	16.2	16.2	0.28	0.53	0.12	0.35
The ratio of space to people	76.3	46.1	53.4	56.4	56.4	73.4	59.2	56.1	60.1	26.1	78.1	33.1
Public arts	1	1	43.2	86.2	96.3	4.30	65.3	72.3	0.69	0.82	0.06	0.25
Climatic comfort	53.4	79.2	66.4	53.3	96.4	19.4	96.2	67.2	0.58	0.76	0.85	0.92
Social interactions	93.3	60.1	88.4	79.2	70.4	75.4	3.33	94.1	56.1	25.1	33/1	1.15
Neighboring uses	92.1	46.1	73.3	05.3	3.32	06.3	06.3	92.2	0.67	0.82	0.01	0.13
Active employment	86.1	46.1	3.33	2.20	83.2	76.2	79.1	63.1	0.48	0.69	0.29	0.54
Variety of activities	96.3	39.1	4.30	99.2	4.30	90.3	68.2	1.95	27.1	1.12	0.88	0.94



Fig. 11. A comparison of the standard deviation of the influence of sociability promotion indicators on the presence of people in the space in annual and daily time frames. Source: Authors.

While the weights of this index are in the annual cycles in the autumn period, due to the frequency of these events in the autumn season, the values are high (2.16).

Ratio of space to people: The weighted average of this index in daily time cycles is one of the highest values in the evening period (4.53). The weights of this index in annual cycles are also high in spring and summer (in spring and summer, 4.56 and 4.73, respectively).

Public arts: The weighted average of this index in time period B is one of the highest values (3.96). The findings show that this index, like traditions and events, has the least changes in different periods.

Climatic comfort: The weighted average of this index in the spring period has the highest value among other indices in different periods (4.96). In daily cycles, the weighted average of this index in the evening period is the highest value (4.66). The findings indicate that in daily and annual time frames, there is climatic comfort in the space, other indicators also have more positive effects. The feeling of pleasure and satisfaction will happen when a person has reached a relative level of physical and mental comfort (environmental comfort). Therefore, it is necessary that at the peak of summer heat and winter cold, to evaluate its thermal conditions and the effective components in creating suitable microclimates and providing a general framework for organizing open public space, it should be identified and formulated. This part of the findings shows the degree of relationship between each index with time

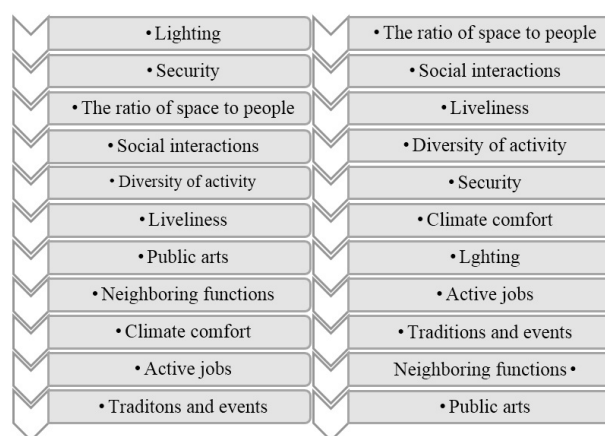


Fig. 12. The effectiveness of indicators for improving the sociability of public spaces from daily time cycles (right) and annual time cycles (left) in Koohsangi field. Source: Authors.

changes. Based on this, it is determined that there is a significant relationship between the influence of indicators of promoting sociability based on the time factor with the degree of sociability of public spaces, and the indicators of security, the ratio of space to people, social interactions and the variety of activities show the most changes in the cycle have different time and the indices of public arts, traditions and events and neighboring uses have the least amount of changes in different time frames (Fig. 11). Based on the summary of the findings, in Fig. 12, the indicators are displayed in the order of effectiveness from different time cycles. Also, the findings of the research show that the

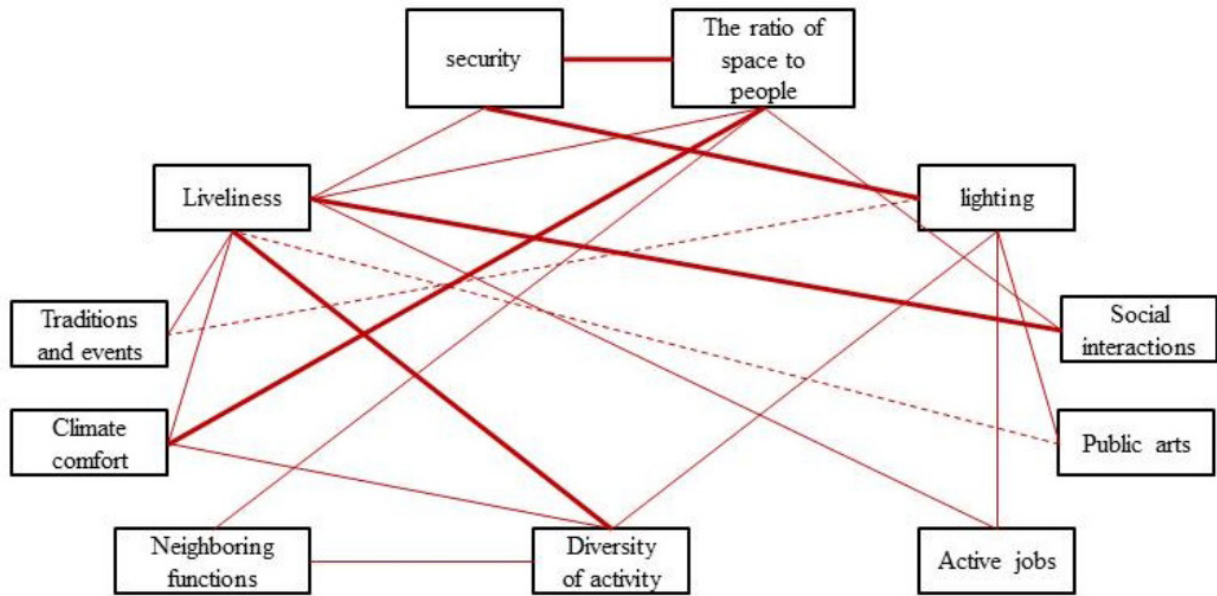


Fig. 13. The degree of influence of the studied indicators on each other in different time cycles, bolder lines indicate the greatest degree of influence. Source: Authors.

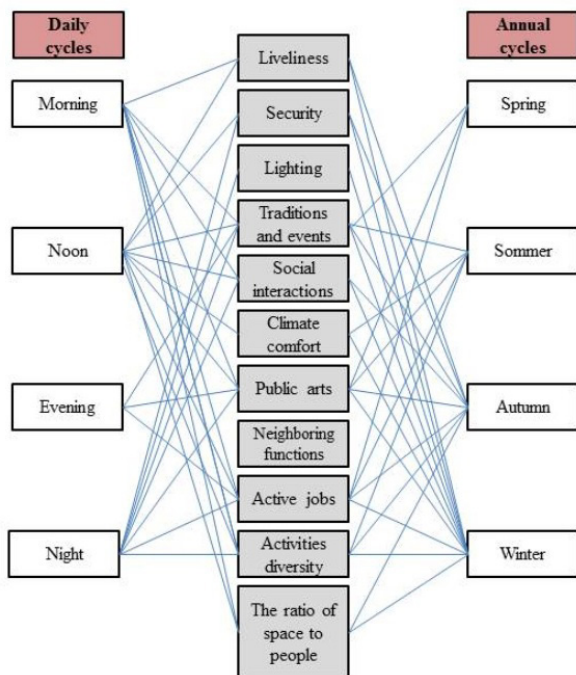


Fig. 14. Prioritization of addressing the indicators of promoting socialization of public spaces in different time frames. Source: Authors.

type of neighboring activities, the level of vitality of the space in different time cycles, and social interactions are acceptable due to the presence of different strata of people in the square. Depthmap outputs have also confirmed the level of permeability and readability of the field to an acceptable level, and this shows that the field physically has the appropriate potential to increase the presence of people. Also, the very favorable climate comfort situation in the field has created a suitable platform for dealing with

sociability indicators of public spaces in different periods are highly dependent on each other; in many cases, their effects in increasing the sociability of the space should be examined together. Fig. 13 shows the correlation of these indicators based on research findings. What is important in this is more attention and emphasis on the periods when each of the indicators has been neglected in the design of public spaces. In fact, it is more necessary to address these indicators in the mentioned time frames and they should be prioritized in the planning and design of public spaces or the improvement of existing spaces. Fig. 14 shows this prioritization based on the findings of the research, to pay attention to each of the sociability indicators investigated in different time frames (Figs. 15 & 16).

Discussion

As presented earlier, the results obtained from the observations and behavior maps are consistent with the Depthmap outputs. This means the adaptation of the organization of the body of the space with the movement and activity system of the space in different time cycles, and the space has appropriate coherence, disreputability, and homogeneity. This issue has improved the sociability of Koohsangi Square. In fact, how the value of connection is dispersed in the public space of Koohsangi Square is correlated with how pedestrians move in it. Regarding the analysis of sociability indicators, most of the indicators have been very successful in attracting people to the space in some specific periods. While this is not the case with other periods and their effects are greatly reduced. What is clear from the findings of the research is that in the current state of Koohsangi Square, the diversity and



Fig. 15. The density of people at different hours of the day in Koohsangi Square. Source: Authors.



Fig. 16. The density of people in different seasons of the year in Koohsangi field. Source: Authors.

other indicators. The results show that some of the collective and local beliefs of Mashhad users, which are focused on theatrical, happy, and festive events, can be a potential source for reorganizing public spaces in different time frames in this city, so by focusing on these events, other aspects can be He theorized public spaces for their emergence.

Conclusion

The findings emphasize that the coordination and integration of indicators with the needs of the audience in different time frames has a great impact on the social-spatial function of public spaces and improving their sociability. Also, the findings of the research show that the sociability indicators of public spaces in different periods are highly dependent on each other; in many cases, their effects in increasing the sociability of the space should be examined together. Research in the qualitative part to the question of what indicators improve the sociability of public spaces and what the quality and quantity of the presence of the audience in public spaces according to these indicators in different time frames, by explaining a

perceptual structure consisting of changing indicators in different daily time frames and has responded annually. Repetition of interviews and observations was to pursue this conceptual model in the examined sample. On the other hand, in confirmation of the above statement, quantitative analysis confirms the correlation between time cycles and the sociability of space (based on a research hypothesis). So that there are meaningful connections between time cycles and the degree of sociability of public spaces. The findings emphasize that the coordination and integration of indicators with the needs of the audience in different time frames has a great impact on the social-spatial function of public spaces and improving their sociability. In the end, the aim of integrating the components of sociability is to increase social interactions, create a desire in users to manage the space and participate in its events, create a deeper connection between users and the environment (form and events), make the space meaningful and valuable, and also keep people in the space for a long time. This research shows that female users, the elderly, and children pursue their desires and needs

Table 2. Suggested strategies based on research findings. Source: Authors.

Grouping	Indicator	Rhythm	Strategies
human	Security	Spatial	- The need to pay attention to the main structures that must remain constant over time to create a sense of belonging;
		Social	- The effect of paying attention to 24-hour rhythms and designing based on them to increase social safety and security, including crime and fear of crime
		Normal	- Increasing the legibility and sensory richness of the urban space through environmental design based on time cycles, such as the change of seasons;
	Neighboring activities	Spatial	- Space-time-place link: the presence of the fourth dimension of time in space and the occurrence of tangible or rhythmic times in accordance with the needs of the users of neighboring users.
		Social	- Identifying time rhythms affected by neighboring activities in space; - Crystallization of social time of neighboring activities in space.
		Normal	- Identification of physiological needs
	Social interactions	Spatial	- The space has a relatively flexible periodic structure for flexible sequences of all kinds of activities, including recreation, and relaxation in public spaces that do not have a fixed period.
		Social	-Intermingling of social space with social activities of subjects (individual and collective);
		Normal	-The centrality of the human body in creating an urban space to create a suitable platform for social interactions.
	Vitality	Spatial	- Discovering the hidden and invisible aspects of the rhythmic structures of space to pay attention to the aesthetic aspects of the passage of time on the body of space, such as shadow movement.
		Social	- Creating environmental vitality through functional mixing at different hours of the day and night; - The need for people to be present at different hours of the day and night to create successful and diverse spaces.
		Normal	- Using the rhythmic structures of different time cycles, such as different seasons or natural light changes in daily cycles to create vitality in the space.
	Variety of activities	Spatial	- Investigating the influence of culture and spatial perception - Organizing the form in a spectrum from formal to informal design
		Social	- Increasing the performance of urban spaces, especially single-function spaces, and the possibility of their optimal use in different periods;
		Normal	The design reflects the passage of time and the difference in landscape perception, creating a suitable platform for different activities at different hours and seasons.
Operational	Traditions and events	Spatial	- Creating a suitable platform for the sustainable activity of various ceremonies and events that are formed according to the requirements of the time; - The existence of unique and specific criteria for each space in the beats due to the native characteristics of the platform.
		Social	- Reading the impact of cultural events on a social life experience based on the available evidence.
		Normal	Recording the gradual passage of time in the body of space to create a collective memory of various events.
	Public art	Spatial	- Explaining the mutual influence of culture, artistic events, the form of presence and the resulting rhythms in the space, and the physical facilities necessary to hold these events in different time frames.
		Social	- Explaining the mutual effect of art and presence in space and its consumption (explaining the effect of ritual activities, nutrition, clothing, make-up, language and dialect, taste and aesthetic preferences, colors, music, and local songs, literature, and art).
		Normal	Explaining the mutual influence of artistic events with the climatic condition and biological antecedents of users with different age groups and in different time cycles (especially periods outside the climatic comfort condition) Using a type of public art for public spaces that also contains local meanings
	Active employment	Spatial	- Creating a suitable physical platform for the presence of various temporary jobs based on the needs of users in different time frames.
		Social	- The possibility of economic development and attracting tourism through the concentration of active businesses in different time frames;
		Normal	- Knowing the physiological needs of suitable jobs in public spaces in different time frames

Rest of Table 2.

Grouping	Indicator	Rhythm	Strategies
Physical	Lighting	Spatial	- Creating a positive mental image of the city with regard to night lighting; - A different experience of the city at night, proper lighting covers the disadvantages of the city and offers a beautiful view of it.
		Social	- Enhancing the sense of security, especially during quiet periods in the space, with adequate quality and quantity lighting.
		Normal	- Proper coordination of artificial light with natural light changes in different time cycles.
	Climatic comfort	Spatial	- Explanation of the mutual effect of climate and physical components in the artificial environment (indices such as the effect of climate and climatic comfort on physical components, settlement, and neighborhoods, geometry of public space, and safety components) based on the periods when the weather is not in a state of human comfort.
		Social	Explaining the mutual influence of climate, and presence in space and how to use those indicators such as determining the types of activities performed
		Normal	- Explaining the mutual influence of climate and general space order resulting from natural elements (indices such as explaining the effect of water, plant, soil, and air order on space) in periods when the weather and climate are not in a state of human comfort; - The possibility of designing cities according to the rhythms of natural periods, for example, using cool night air, especially in tropical areas.
	The ratio of space to people	Spatial	- Explaining the mutual influence of the density of people and physical elements in the artificial environment (indices such as the effect of density on physical components, settlement, and neighborhoods, geometry of urban spaces, and safety components).
		Social	- Increasing the time available to people and reducing accidental and unexpected encounters as a result
		Normal	- Knowing the negative effects of crowding on customers of different age groups and the tolerance threshold of each for crowding (this threshold also changes in different time frames);
			- Predicting the ratio of space to people to prevent the occurrence of crowding and solitude that causes alienation of the space.

very seriously in public spaces. Although their presence in public spaces is few and limited to specific hours and places, they have a definite effect on the behavioral patterns of other users, so focusing on this category of

users can expand the findings of the research. Based on the summary of research findings, suggested strategies for improving the level of sociability of public spaces in different periods are presented in Table 2.

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