The impact of physical components of the environment on the sociability of cultural-recreational spaces case study: Rasht cultural complex

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ABSTRACT
The focus of the research is to analyze and evaluate the impact of physical space in the environment as a spatial system on the social interactions of users. The role of the physical components of the environment for the sociability of the environment and the desire to work in spaces is examined. In this research, the physical components of the environment as an independent variable that affect the quality of socialization of physical spaces as a dependent variable. To analyze, the physical environment is considered a socio-behavioral place. In this regard, by recognizing the types of public spaces as a physical environment and recognizing their qualities and functions, we reach the necessity of having cultural-recreational spaces as a platform for the formation of social life. The present research descriptively and analytically examines the sociability of the physical environment as a necessary spatial quality in cultural-recreational spaces, and by recognizing the physical components and sociability activity, analyzes these components in the present case. Data collection was done through questionnaires, interviews, and field observations. The final part of this research shows that security, as the most important environmental quality that results from the impact of components such as confinement and lighting and control and monitoring and visual access, has a direct impact on the sociability of the analyzed sample.

ARTICLE HISTORY Received 7 July 2021; Revised 19 October 2021; Accepted 8 November 2021

KEYWORDS Architecture; socialization; sociability; cultural spaces

Introduction

In the modern world, with the increase of individualism, attention to public spaces to bring people closer to each other and increase social interactions has been lost. Whyte [1] emphasizes the need for quality public spaces to facilitate social interaction and civic presence. He also believes that social life in public spaces fundamentally helps to improve the quality of life of
individuals and society. Also, it is necessary to pay attention to the role of human behavior patterns in the face of the physical environment and its socialization. Nowadays, the psychological understanding of human behavior has been considered by architects and urban designers because human behavior is closely related to the physical environment. Human behavior is influenced by the physical environment, and in return, human behavior affects the environment with its behavior influenced by culture, economy, and social factors. Gehl [2] believes that by designing a physical environment, one can influence the number of events and the number of people who use public spaces, the duration of an activity, and the type of activity. He also believes that the creation of activities in public spaces is influenced by some factors in which the artificial environment is one of them.

According to Carmona [3] definitions of public spaces, cultural-recreational spaces are grouped into the category of indoor public spaces. By recognizing the social dimensions of cultural-recreational spaces such as socialization, its relationship with the physical structure of spaces can be achieved. The process of socialization can be achieved by establishing interaction and social communication between the users of any public space, which is itself affected by the physical structure of the space. The physical components of space affect human behavior patterns and increase or decrease their presence in spaces.

The city of Rasht, with its temperate and humid climate, plays an important role in the participation of its inhabitants. In such a climate, social activities can be seen in many outdoor environments. The cultural background of life in Rasht has led to extensive interactions and cooperation between them for living. The existence of borders in the urban context can itself cause behavioral problems in humans and manifest a kind of dichotomy, including financial, behavioral, identity, and practical. The people’s perception would be varied in the face of two environments with a similar design, but with radically different ages. Therefore, the existence of various cultural-recreational spaces is a response to meet the social and behavioral needs of the people of this city. The aim of the research is seeking for new methods to transfer the historical contexts to urban space and also preserving their identity, culture, and function as well as to create a new space as a heritage for the future through questionnaires, interviews, and field observations. In addition, the effective parameters are also examined to lead to a comprehensive result.

**Literature review**

The need for public spaces to meet collective needs has long been considered. From pre-modern times, urban public spaces such as the Agora in Greece played economic, political, socio-cultural roles. In Iran, since ancient times, markets have played the role of public spaces as a platform for socio-economic interactions. Urban squares played an important role in socio-
cultural and economic terms. According to Gibson’s theory [4], three types of environments are defined in psychological science, the terrestrial environment, the cultural environment, and the animate environment. According to Gibson’s definitions of environments, in dealing with issues related to environmental psychology, it is necessary to pay attention to the geography, history, identity, and climate of the region.

Theoretical review
Shojaei [5], in search of creating and reproducing sociable public spaces as a place of social interactions to create sustainable space, describes the presence of people in public spaces at the scale of a neighborhood and how these spaces lead to socialization, then in the theoretical foundations of research, the need to address socialization in public spaces at the following categories: promoting social interactions among citizens, promoting the sense of the presence of citizens in various areas, providing the psychological and emotional needs of citizens resulting from public and urban spaces and promoting people’s sense of belonging to spaces. Finally, it is concluded that public spaces at different scales have their role and function and the existence of these spaces at different scales is essential. The absence or lack of improper functioning of these spaces imposes the role of this space on other spaces on other scales.

Moghaddam [6] examined the effective components of human-environment interaction in the physical environment. In his research, the sociability of space means that physical space, based on its spatial characteristics, causes the formation of activity centers and the desire to work in certain parts of space. User interactions in the environment, activity systems, and activity spaces have been studied. In this regard, 27 case studies have been selected in three housing groups in the city of Hamedan. The research framework in this research shows that the sociability of activity spaces in addition to the spatial structure is affected by lifestyle. Finally, the results of the research show how the architectural space relates to the (natural) environment, and natural elements create quality in the space that itself is effective on the desire for public activities in that space.

Experimental review
The city of Rasht, with its temperate and humid climate, plays an important role in the participation of its inhabitants. In such a climate, collective activities can be seen in many outdoor environments. Rasht Municipality Square is considered the oldest urban square in the center of Rasht as the main central gathering space. This square was built in its new style between 1942 to 1945. There is a municipal office, a clock tower, a post museum, and the old building of Iran Hotel, all of which are attributed to the first Pahlavi period. This square has had a multi-role function such as traffic, gathering place, and citizens’ leisure, commercial, administrative and cultural leisure. Between 2011 and 2013, Municipality Square
became a public pedestrian and social space in the center of Rasht by repairing the pavements and expanding the dimensions of the sidewalk and banning cars from entering the sides of the square. The municipal square, as the central core of the city, has administrative, commercial, and cultural uses. Due to the existence of these uses and parallel activities in the square and also in the old market of Rasht, the dynamism of vitality can be seen in the municipal square at all hours of the day and night (Figure 1).

Due to Moghaddam [6], there are three main activity components including activity, physical and spatial components that affect the sociability of the urban space. The activity components of the environment that have led to the sociability of the field are adjacent to the old market of Rasht and strengthening the pedestrian axes of the shops around the square by paving and furniture. The physical components of the environment that have led to the sociability of the field are the restoration of the square pavement and emphasis on pedestrian orbit, the existence of various furniture, and the presence of natural elements such as a waterfall in the center of the square. By examining the physical and functional structure of the field and the physical, spatial, and activity components affecting the sociability that led to a sense of security in the field were extracted as follows:

- Physical accessibility: The square has pedestrian access from every corner.
- Visual accessibility: The field is visible from all defined inputs before entering.
- Enclosure: The square is surrounded by urban bodies and the difference in height from the four sides is surrounded by plants and Commercial bodies with dynamic and lively field walls have certain privacy.
- Lighting: Diverse environment at all hours of the day
- Dynamic use: The existence of active uses day and night, such as street music, street theater, etc. provides social dynamism at all hours of the day and night.
- Spatial components: The type of spatial shapes of the environment is designed in such a way that it has an invitation to the square which is in the center of the space. The design of sharp corners and angles has also been avoided.

According to field observations and research, the most important physical components of the environment that lead to socialization were the proximity of the square to the old market of Rasht, which is connected to the square by defining paved sidewalks. Other factors influencing the feeling of security are often people sitting on the sidewalk of the street. Based on the indicators of the urban center, such as a large number of pedestrians and the mixing of functions, people in one place behave similarly to another place [1]. In the seventies and eighties decades, the versatility of commercial complexes led people to consider Rasht municipality square (Figure 2) as valuable public space.
Figure 1. Rasht municipality square [municipality achieve].
Theoretical framework

To study the components affecting urban space, each of them has been studied and identified separately. Each of the components, individually and concerning each other, affects the environment. The five main components, which include security, sociability, behavioral patterns, recreational-cultural spaces, and urban public spaces, and according to the studies performed in the case study, have been studied and analyzed. The results of these studies are fully described in the finding section. In addition, since 2019, the Coronavirus pandemic has changed the world. How the world will change post-COVID-19 remains to be seen. But one thing is for certain: The way we create live-work spaces will be drastically different than the way it was pre-pandemic. This pandemic was not the first and may not be the last, therefore predicting solutions to similar crises ahead is a fundamental requirement in designing the future concepts of the public spaces.

Public spaces

According to the division provided by Carmona, public space refers to all spaces that can be accessed and used by normal people. Public spaces include 1- External public spaces 2- Internal public spaces 3- Internal and external semi-public spaces. Squares are listed in the category of outdoor public spaces and cultural-recreational spaces are listed in the category of indoor public spaces. Carmona refers to today’s public spaces as public realms, which are referred to as ‘social places and environments’. These domains serve as a platform for a common and neutral context for social interaction, communication, and as a stage for social cognition, personal development, and information exchange [3].

Public space can be defined as space that includes parts of the natural and man-made environment that are easily accessible to the public and includes: streets, squares, and other paths that others have the right to cross in residential areas. The most important feature of the public spaces is accessibility for all and the other is freedom of action. Therefore, this context creates the possibility of wide interaction of individuals with each other and the possibility of social actions [7]. Restrictions on the use of public space and physical distancing have been key policy measures to reduce the transmission of COVID-19 and protect public health. At the time of writing, one-half of the world’s population has been asked to stay home and avoid many public places. What will be the long-term impacts of the COVID-19 pandemic on public space once the restrictions have been lifted? The depth and extent of transformation are unclear, especially as it relates to the future design, use, and perceptions of public space. The COVID-19 crisis may fundamentally
Figure 2. Accessibility to the square, definition of urban bodies, urban furniture, and key entrances [the author].
change our relationship with public space. In the ensuing months and years, it will be critical to research and measure these changes to inform urban planning and design in a post-COVID world [8].

Wolfgang categorizes the tasks of the public space as follows: 1- A tool for communication 2- A place for confrontation 3- Management and coordinator of free citizens [9]. One of the important issues related to public spaces is the concept of anthropology, followed by behaviorism in urban spaces. Hence, the need of people for places for social interactions and to meet psychological needs has become one of the necessities of urban life. New perspectives on the promotion of urban public spaces can be interpreted as attention to the establishment and reintegration of disintegrated cities. But another way of looking at it could be that public space is a marketing tool for the place. Places, in the world of economics, compete with each other to attract more resources and to create a safe and attractive environment for investors and their employees [10].

Lang believes that in urban public spaces, patterns of interaction of particular are important. If people are attached to these spaces and their environment, social interactions will take place at their strongest. Public spaces can also be a platform for the development and formation of individual and social identities. These spaces, if they are accepted by citizens, by empowering the city environment, have special social functions that include: the place of formation of social interactions, increasing the number of social resources in the city, the place for the formation of social integration, and a context for nurture the cultural and social values of a nation or people [11].

Based on studies on the quality of urban public spaces in the world and based on qualitative research and a questionnaire, it was determined that users of urban public spaces consider issues such as security, accessibility, and cleanliness of public spaces as the most important factor in space quality. Physical maintenance of public spaces is valued less. Lang mentioned that research conducted on more than 1222 urban public spaces in different countries of the world shows that four basic factors are more important in measuring the quality of urban public spaces. These factors include 1. Accessibility 2. Comfortness 3. Activities 4. Sociability [11].

Judging the importance of the quality of public spaces depends on the personal perception of individuals, and different people evaluate different factors influenced by many aspects of their environment and culture. In the sample research, the following items were evaluated and analyzed in the form of a questionnaire and observation research: 1. Heritage protection 2. Maintenance 3. Safety 4. Transportation 5. Cleanliness 6. Pedestrian accessibility 7. Attractiveness/greenery 8. Antisocial behavior 9. Activity/social 10. Street furniture/seating [11].
Recreational-cultural spaces
Creating suitable facilities for cultural-recreational activities is a requirement of contemporary human life. These activities include spending leisure time as well as holding events and gatherings. In today’s world, spending leisure time has dimensions beyond the role of play and relaxation and can lead to individual and social development. As a result, to satisfy their physiological and social needs and to play social roles, human beings need spaces with appropriate boundaries and conditions. They are places to create and strengthen external relations, interactions, changes, and social confrontations, and places where different groups come together with different desires and interests.

It is necessary to provide a cultural-recreational environment in which, in addition to meeting the physical needs, it responds to the spiritual needs of the users to perform tangible experiences. The existence of collective life in cultural spaces as public urban spaces depends on promoting social interactions, creating security, attracting different individuals and groups, and thus encouraging more socialization and creating a lively and dynamic atmosphere [1]. These spaces should be accompanied by behaviors and coordinate current activities in them and be designed following these behaviors and activities.

The loss of this structure results in the incompatibility of some features of these spaces, such as performance, size, quality of design with the physical and mental conditions of different age groups, causes that these spaces are not fully able to meet the needs of different people [12]. Due to the incompatibility between activity and physical environment, there is no coherence link between behavior and place, and these urban spaces lose the ability to create complete satisfaction with the space and the context of appropriate social behaviors in some ages and they cannot be used appropriately by everyone. The topic of urban cultural spaces is a serious challenge for architects. When designing public areas, it is important to consider the features of the city, its history, uniqueness, opinion of the population, and also the culture. Several tasks can be solved through the improvement of the city: the development of comfortable urban space, attracting tourists, and preserving the cultural heritage. The choice of certain landscaping projects in most cases requires historical and cultural examination [13].

Behavioral patterns and experiences in the environment
Human behavior is a product of the environment and the interaction of the two with each other. As a result, various physical environmental factors such as sound, light, furniture, movement patterns, and continuous access, affect human beings and their behavior. In environmental psychology, human behavior is influenced by factors such as the physical factors of symbolic environments, design data, and the spirit of the environment. In return, human beings affect the environment with their behavior, which is due to cultural, social, economic, and personality aspects, and transform it to satisfy their physiological and social needs and organize the space [14].
In practice, the basis of our behavior is the characteristics of the environment and individual characteristics, so our behavior is the result of the needs, motivations, capabilities of the environment, perception, mental image, and ultimately the meaning that we have created for the environment. Our activities can take many forms under the influence of these factors (environmental and individual). Canter [15] believes that ‘whenever the perception and experience of a place can be decomposed into recognizable components, the perception and experience itself is a reference unit for understanding behavior’. Outdoor activities in public spaces can be classified into three groups, each of which requires different characteristics in the artificial environment: essential activities, selective activities, and social activities. Essential activities are activities that we have to participate in. Daily activities fall into this category. Selective activities take place when there is a desire to do them, such as walking. Social activities depend on the presence of others, such as meetings, conversations. In low-quality urban spaces, only necessary activities are performed. However, in high-quality environments, due to better conditions, the tendency to spend more time on selected activities increases.

**Sociability**

The subject of socialization has been studied from different scientific angles and perspectives, and in the field of architecture and urban planning, according to the impact of the environment and the application of architecture on the orientation of human behaviors, studies have been conducted based on the sociability of architectural space. The sociability of space is so important that many theorists have emphasized the impact of this quality on attachment to living space. According to these points of view, attachment to a place is not only enhanced by the physical aspects of a place but also the quality of social interactions in the place affects the attachment to the place (Moghaddam 2011). ‘Wherever people are – in buildings, in neighborhoods, in urban centers, in recreational areas, and the like, human activities appeal to others. New activities begin around where an activity or event is taking place’ [2]. Whyte [1] discusses the close relationship between the quality of urban spaces and urban activities, and how simple physical changes can significantly improve the use of urban space. The result of the socialization of an environment is a condition for the continuity and life of that environment. By defining various activities, people are attracted and the presence of people also attracts others, which leads to the formation of new activities and causes social and economic life in that space.

**The impact of architectural space on socialization**

The basis in the theory of the ‘effect of architectural space on socialization’ is based on the effect of body and environment on human behavior. The theoretical foundations of this topic originate from the scientific fields of
environmental psychology and behavioral sciences. The use of the words sociable and evocative indicates the quality of the space that brings people together or separates them [11].

According to the definitions, two types of sociable environments and an anti-sociable environment are defined. Sociable environments encourage social and collective behaviors and an anti-sociable environment reduces social change. Therefore, creating inviting spaces following the climate and capabilities of the site and taking into account the cultural characteristics and socio-economic context will lead to active and passive public participation and strengthen collective life. anti-sociable environment often promotes high speeds and isolated bodies, and route design is envisaged as a passageway, while in sociable spaces it emphasizes pause, shrinkage, and presence. sociable spaces with the qualities they offer are often a good platform for optional activities.

Socialization in urban space is initially an objective issue that exists due to the quality of the appearance of physical factors. Although urban space is initially perceived through the context, what gives it meaning is the feeling and mentality of individuals [16]. ‘The process of socialization within public spaces is based on four stages: accepting the space for the presence of people, providing mental and physical comfort, enjoying the present in the space and the continuation of active social presence in the space’ [17].

Dimensions of the physical component of sociability include the formation and organization of space, the location of accesses, protection, and facilities, and form. Dimensions of socialization activity components also include problems and obstacles to users’ movements, evaluating the performance of spaces, and how users use space. Finally, the dimensions of social components of socialization include the social conditions and characteristics of the activity and the existence of public spaces with the characteristic of socialization. Besides, the sociability of public spaces promotes a spirit of solidarity, individual growth, and for all citizens, regardless of gender, race, ethnicity, age, or social and economic status [18]. Gehl believes that the physical framework does not have a direct impact on the quality, content, and intensity of social communication. But planners and designers can influence the possibility of meeting, seeing, and hearing, which in itself provides a background for other forms of communication. In addition to the importance of the number of people and activities in the events located in space and the importance of continuity of activities, the duration of being in space is also important for each person. It is not enough to create spaces for people to moving around, but there must also be favorable conditions for wandering and lingering in space [2].
Socialization in urban public spaces is based on people’s need for a sense of social belonging and interaction with each other, and this will be possible in a social space along with providing physiological comfort, claiming territory, a sense of ownership, and receiving justice in space [11]. By examining the physical components and sociability activity, the components and criteria affecting the sociability of indoor cultural-recreational spaces were extracted. In this research, according to recreational-space use, readability, security, and desirability were considered.

**Security**

Security is a perceptual-emotional phenomenon and is more related to the psychological feeling of citizens than threatening factors such as crime. In general, there are two dimensions to security, the objective dimension that is evaluated by objective, environmental and behavioral factors, and the other is the mental dimension that is understood based on the sense of security. Definition of security in different societies due to different experiences of individuals and society the man-made physical environment is as much a social phenomenon as it is a physical phenomenon. As a result, environmental qualities such as security (individual and social) transform the physical environment into a social environment [19].

Factors affecting the feeling of security in an environment include Individual components such as age, gender, social groups, cultural groups, family support, and physical components of the environment such as Lighting and lighting methods, Accessibility, Mechanical, and natural monitoring, and confinement.

1. Lighting and lighting methods: One of the most important factors that increase the sense of security is the use of light and brightness. This means that in spaces that do not have proper lighting, there is a ground for abnormal behaviors and even fear of some clients from the space [20]. Keeping urban spaces alive and beautifying them more at night requires better and more urban lighting. Installing a large number of light sources does not create more visual value., The installation location, lighting sources, the effect of light, type of Light, etc. are factors that also increase the attractiveness of spaces and increase their efficiency [21].

2. Accessibility: Accessibility can be categorized as follows:
   (1) Physical accessibility: If a person can enter the space, that space is considered to have physical accessibility.
   (2) Visual accessibility: Achieves when people can see the space before entering it and judge the comfort, attractiveness, and safety of the space [22].
(3) Symbolic accessibility: Symbols can be stimulating or non-stimulating and persuade or threaten a person to enter a space, for example, the presence of people with different appearances can be attractive or repulsive [22].

(3) Monitoring: Monitoring and observation create a sense of security in public spaces. Because gathering a group of people creates a safe environment that prevents incitement to crime [22].

(4) Enclosure: If the buildings are designed like military forts in such a way that the facade of their ground floor is covered, the result will be that space will be boring for pedestrians and people will have no motivation to walk on the street. Murals and carvings can fill the blanks and reduce their uniqueness, but these measures can never replace the perception of activities. People enjoy each other’s participation in urban life [11]. Some refer to a safe space as a defensible space, which is a space in which more people work, a greater sense of security is perceived, and less criminal activity is allowed.

In general, some features of safe urban space are expressed as a safe and comfortable space for socializing, a place to do activities, and the potentials of the place to persuade people to participate in activities

**Material and methodology**

The methodology of the research is based on a comparative approach in which the socio-cultural similarities and differences in each era are extracted. The logic of the comparative research emphasizes that mechanical and simplistic thought to the social world is not compatible with the nature of the realities of this world since different patterns of development and evolution confirm the probabilistic and random patterns rather than deterministic ones. This research aims to provide solutions based on probabilistic and random patterns for connecting historical contexts to urban space while preserving their identity, as well as to create a new space as a heritage for the future and a link between the past and the future.

This research is methodologically innovative in the ways it seeks to understand how individuals’ buildings manage their context identities. It aims to capture interaction on targeted in real-time. This will enable the analysis to focus not only upon the finished ‘product’ of design but also to see the actual process of constructing that finished ‘product’. What we will see, in other words, is something like fundamental ‘construction’ and ‘repair’. This form of data collection will reveal to us the ‘hidden moments’ of space interaction, moments of identity construction, management, and repair that have previously remained unseen. It means transforming the historical context (which mostly acts as an exhibition space) into a living urban organism.
Finally, the extracted data that affecting sociability are analyzed by the Friedman test and categorized into different groups to survey the relationship between every individual parameter on the socialization of the space.

**Site plan and general requirements**

The research method has been applied quantitatively. The research method in this research is descriptive-analytical. The descriptive-analytical-based research allowed us to describes and recognizes sociability in public spaces and its promotion and creation factors. Also, it requires the study of the relationship between different factors and socialization in public spaces, and in some parts of the research analytical method has been used. In the main part of the research, i.e. case study, the field researching method has been used. The data collection tool in this method was a questionnaire, observation, and presence in public spaces. The questionnaire is designed to measure the criteria and sub-criteria of socialization in public spaces and to respond to waste and research hypotheses. Observation and presence in space by the researcher on several consecutive days at different times of the day and presence in all spaces. Data analysis was performed by three separate methods. Initially, the data obtained from observation and presence in space were analyzed using a qualitative approach. This analysis was based on content analysis and was done by the researcher. Descriptive statistics and inferential statistics are other methods of data analysis in this research. To explain the inferential statistics of research and according to its subject and scope, research hypotheses are the type of relational hypotheses with no direction.

The type of research is applied and to measure the sociability of space, the physical and functional components of this concept were examined. The physical dimensions of space have been measured on the human and social dimensions of space users. To measure and evaluate the mentioned components in the case samples, the Rasht Palace Cultural and Entertainment Complex was analyzed as a sample of the internal public space.

**Case study**

The Rasht Palace Cultural and Entertainment Complex is the first and only indoor amusement park in the north of Iran. This place was built in 2008 with the necessary survey and preparation of suitable land on the Rasht-Anzali Road. The game palace complex was officially opened in April 2011. Among the facilities of this complex, we can mention the happy games hall, bowling alley, billiard hall, amphitheater hall, restaurant, coffee shop, and traditional tea house next to the pond.

The shape of the public space of any city is primarily creating of its social culture and secondly influenced by the ruling group. The participatory culture of the people of Rasht demands public spaces such as cultural and
recreational spaces that bring them together in a single environment. The indoor complex of Rasht Palace has brought together a variety of functions for all ages and strata in an enclosed environment (Figure 3).

Field observations
The main access of this indoor complex is defined by the Anzali Road. The entrance is controlled by the guard and checking ID card. Pedestrian entrances are also guarded by defining the access hierarchy. The complex is defined by an open area where walkways, outdoor playgrounds, and parking lots are enclosed and an all-around wall. The sidewalk and in the next degree create dense vegetation for the complex. The uses of the complex for all ages include the following: an indoor playroom on the first floor for children under 12, a bowling alley and the billiard hall for teenagers and older people, a second-floor playroom for children 12 to 18 years old, an amphitheater for celebrations and ceremonies, cultural products for children.

- Accessibility: Glass walls provide visual connection, which enables vision and control from outside to inside and vice versa. The existence of terraces on the second floor provides a full view for users.
- Lighting: Various lighting of the interior of the complex is defined for various activities, ambient lights for the playroom, and spotlights for various play equipment. The grounds of the Rasht cultural complex are illuminated on sidewalks and playgrounds around the square clock.
- Control and monitoring: The entrances of the Rasht cultural complex are controlled by the guard. To prevent crime, entering to Rasht cultural complex is possible only by checking an ID card (Figure 4).

Table 1 illustrates the effective parameters on the sociability of the Rasht cultural complex. The three effective components including physical, activity, and spatial are sorted and explained. The physical and activity components are examined individually but spatial components, due to their similarity and overlaps with other components, are merged with two other components.

Research findings

Analytical framework
Parameters affecting physical components and commercial and recreational activities were assessed by questionnaires, field observations, and information obtained from the municipality. It has been designed by dividing the effective dimensions in the Rasht Palace Cultural and Entertainment Complex and according to the following criteria related to closed questions with ranked answers. In the process of comparing and analyzing the results, two methods of analysis have been used to investigate the factors affecting feasibility. The first method is to use architectural data and architectural
Figure 3. The site plan and main entrances of Rasht palace cultural and entertainment complex [Google map, the author].
Figure 4. Enclosure and privacy for the building [the author].
Table 1. Effective parameters on sociability.

| Components of sociability | Impressive dimensions                                           | Criteria                                                                 | Spatial qualities | Measurement method |
|----------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------|-------------------|--------------------|
| Physical components        | 1. Access                                                        | Physical access                                                          | Inviting          | Observation        |
|                            |                                                                  | (Pedestrian access–Public transportation)                                 |                   |                    |
|                            |                                                                  | Visual access                                                             |                   |                    |
|                            |                                                                  | (Social monitoring)                                                       |                   |                    |
|                            | 2. Per capita                                                    | Position and responsiveness in terms of space functional scale            |                   | Observation        |
|                            |                                                                  | Position the inputs relative to each other and the arteries around the complex |                   | Observation        |
|                            | 3. Entrances                                                     | Physical comfort in basic activities: walking, sitting, standing, stopping to see, and talk. |                   | Interview          |
|                            | 4. Physical comfort                                             | Ambient lighting control entertainment equipment                         |                   | Interview           |
|                            | 5. Protection                                                    | Climatic protection against weather conditions                            | Security          | Interview-Questionnaire |
|                            |                                                                  | Protection against crime                                                 |                   | Interview           |
|                            | 6. lighting                                                      | The presence of a central void in the middle hall as a sign              | Legibility        | Interview-Questionnaire |
|                            |                                                                  | Easy access pattern to spaces                                            |                   | Observation        |
|                            | 8. Movement pattern                                             | Parallel functions such as cafes, restaurants, service shops             | Desirability      | Interview-Questionnaire |
|                            | 9. Sound                                                         | Possibility to enjoy ambient sounds                                       |                   | Observation        |
|                            | 10. Furniture                                                    | Existence of motivating furniture such as paintings and stopping furniture for sitting |                   | Interview           |
|                            | 11. Mechanical facilities                                       | Such as air conditioning and the possibility to enjoy in different climatic conditions |                   | Interview-Questionnaire |
|                            | 12. Facilities and services                                     | Impact on spaces                                                          |                   | Interview           |
|                            | 13. Optimal design                                              | - Accessibility for all age and gender groups and categories             | Active response   | Observation        |
|                            |                                                                  | Spatial diversity and activity in attracting different groups existence of vitality and dynamism in the environment |                   | Interview-Questionnaire |
|                            |                                                                  | Activities such as watching dialogue and cultural communication          |                   | Observation        |
|                            |                                                                  | Parallel activities such as shopping and active activities through the day and night | Security          | Observation        |
Chart 1. The framework of the research.

factors theoretically. In the second method, the data extracted from the questionnaire are evaluated to achieve a comprehensive and accurate analysis using the Friedman method.
Comparison of dimensions affecting physical components quality

According to table number 8, it can be seen that the highest average rating is allocated to the lighting factor, so it has the highest quality in the Rasht entertainment complex, and the lowest average rating is allocated to sound, so it has the lowest quality in the Rasht entertainment complex.

Factors affecting the presence of users from users’ point of view
According to table number 9, factors affecting the presence of users from users’ points of view have been analyzed by the Friedman test.

| Table 2. Gender frequency. |
|---------------------------|
| Gender | Men | Women |
| Frequency | 10 | 19 |
| Frequency Percentage | 34.5 | 65.5 |

| Table 3. Age-frequency. |
|-------------------------|
| Standard | Minimum | Maximum | Average | Standard Deviation |
| Age | 31.83 | 57 | 20 | 8.55 |

| Table 4. Education frequency. |
|------------------------------|
| Education | High School Diploma | Associate Degree | Bachelor | Master | PhD |
| Frequency | 7 | 5 | 13 | 1 | 3 |
| Frequency Percentage | 24.1 | 17.2 | 44.8 | 3.4 | 10.3 |

| Table 5. Occupation frequency. |
|-------------------------------|
| Occupation | Frequency | Frequency Percentage |
| Unemployed | 6 | 20.7 |
| Student | 3 | 10.3 |
| housewife | 1 | 3.4 |
| Self-employed | 9 | 31.0 |
| manual worker | 4 | 13.8 |
| Employee | 5 | 17.2 |
| Medical Doctor | 1 | 3.4 |

| Table 6. Importance of spaces. |
|-------------------------------|
| Lobby | Central Void | Game Center | Café and Restaurant | Open Space |
| Frequency | 1 | 1 | 13 | 5 | 8 |
| Frequency Percentage | 3.4 | 3.4 | 44.8 | 17.2 | 27.6 |
Figure 5. Glass walls and terraces, providing a visual connection [the author].
Analysis of the role of physical components on socialization
According to table number 11, the control variable is positive (8.148), and according to the results, if A refers to accessibility, B refers to lightening, C refers to sound, D refers to form, E refers to esthetics, and Y To be called sociability, the regression relationship between physical components and sociability is as follows:

\[ Y = 8.148 + (0.171 \times A) + (0.143 \times B) + (0.072 \times C) + (0.684 \times D) + (0.281 \times E) \]

Analysis of the role of activity components on socialization
According to table number 13, the control variable is positive (5.644), and according to the results, if A refers to Security and Safety, B refers to facilities and services and Y To be called sociability, the regression relationship between activity components and sociability is as follows:

\[ Y = 5.644 + (0.236 \times A) + (0.121 \times B) \]

Analysis of the role of spatial components on socialization
According to Table 15, the control variable is positive (6.033), and according to the results, if A refers to comprehensiveness, B refers to comfort, C refers to dynamism and Y To be called sociability, the regression relationship between physical components and sociability is as follows: \[ Y = 6.033 + (0.796 \times A) + (1.083 \times B) + (1.065 \times C) \]

Comparison of the physical, activity, and spatial components on sociability
According to Table 16, it can be seen that the value of “Asymp. Sig (p)” between sociability with components of physical, activity, and spatial quality is less than 0.05, so there is a correlation between sociability and components of physical, activity and spatial quality.

Since the value of the ‘correlation coefficient’ between sociability and physical components is about 0.4 and 0.6, there is a significant relationship between them. The value of sociability and activity components is about 0.6 and 0.8 and the value of sociability components of spatial quality is between 0.6 and 0.8, as a result, there is a strong relationship between them, as well as physical components. Furthermore, the value of the ‘correlation coefficient’ in all of the components is positive which means there are direct relationships between them and sociability.
Figure 6. Lightening [the author].
Table 7. Effective parameters.

| Alternative                  | Minimum | Maximum | Average | Standard deviation |
|------------------------------|---------|---------|---------|--------------------|
| Physical                     | 22      | 43      | 34.66   | 5.20               |
| Accessibility                | 4       | 12      | 7.55    | 2.18               |
| Lightening                   | 5       | 12      | 9.90    | 1.57               |
| Sound                        | 1       | 4       | 2.03    | 0.98               |
| Form                         | 1       | 4       | 3.07    | 0.88               |
| Esthetics                    | 7       | 16      | 12.10   | 2.99               |
| Activity                     | 21      | 33      | 27.93   | 3.34               |
| Safety and Security          | 5       | 16      | 12.38   | 2.27               |
| Facilities and services      | 10      | 21      | 15.55   | 2.81               |
| Quality of Spaces            | 14      | 29      | 23.38   | 3.48               |
| Comprehensiveness            | 1       | 4       | 2.90    | 1.05               |
| Comfortness                  | 6       | 15      | 10.93   | 2.03               |
| Dynamism                     | 3       | 8       | 6.24    | 1.27               |

Table 8. The friedman test.

| Number       | 29 |
|--------------|----|
| Chi-Square   | 91.85 |
| Df           | 10 |
| Asymp. Sig   | 0.00 |
| Alternative  | Average Rank |
| Accessibility| 4.45 |
| Comprehensiveness | 6.28 |
| Safety and Security | 7.05 |
| Lightening  | 8.40 |
| Sound       | 3.47 |
| Facilities and services | 4.29 |
| Comforts   | 5.38 |
| Form       | 7.43 |
| Esthetics  | 3.72 |
| Dynamism   | 7.21 |

Table 9. The friedman test.

| Number       | 29 |
|--------------|----|
| Chi-Square   | 27.24 |
| Df           | 10 |
| Asymp. Sig   | 0.00 |
| Alternative  | Average Rank |
| Ease of access | 4.78 |
| Space’s quality and Form | 5.72 |
| Services quality | 5.34 |
| Personnel’s treatment | 6.10 |
| Variety and quality of equipment available for gaming | 5.91 |
| Uniqueness  | 6.86 |
| Family atmosphere | 7.05 |
| Air conditioning | 5.91 |
| Security and safety | 6.67 |
| Facilities for a diversity of people | 6.29 |
Main findings
Considering the importance of cultural centers in the contemporary period and their important role in promoting social interactions, the role of spatial, physical, and activity in this case study to promote socialization was studied using the parameter analysis method. According to the studied parameters, the spatial, physical, and activity and the arrangement of the spaces next to each other have a direct effect on the use of spaces and express meaningful social relations. Examination of the link parameter showed that this parameter has a high correlation between the studied sample. Examining the communication parameter also showed that the

| Model | Nonstandard coefficients | Standardized coefficients | t | Asymp. Sig (p) |
|-------|--------------------------|---------------------------|---|----------------|
| Control Variable | 8.148 | 1.632 | 4.994 | 0.000 |
| Accessibility | 0.171 | 0.131 | 0.290 | 1.309 | 0.020 |
| Lightening | 0.143 | 0.200 | 0.175 | 0.717 | 0.048 |
| Sound | 0.072 | 0.237 | 0.055 | 0.304 | 0.041 |
| Form | 0.684 | 0.411 | 0.470 | 1.664 | 0.011 |
| Esthetics | 0.281 | 0.102 | 0.632 | 2.670 | 0.014 |
| Security and Safety | 0.236 | 0.095 | 0.417 | 2.475 | 0.020 |
| facilities and services | 0.121 | 0.077 | 0.264 | 1.563 | 0.013 |

Table 10. Two way anova spss.

| Model | R | R² | Corrected R² | Standard Error |
|-------|---|----|--------------|----------------|
| Physical component for socialization | 0.516 | 0.266 | 0.107 | 1.214 |

| Alternative | Total squares | Df Average squares | F | Asymp. Sig (p) |
|--------------|---------------|-------------------|---|----------------|
| Regression | 12.300 | 5 | 2.460 | 1.669 | 0.018 |
| Remaining | 33.907 | 23 | 1.474 | 0.000 |
| Total | 46.207 | 28 | 0.000 |

Table 11. Regression coefficients.

| Model | R² | Corrected R² | Standard Error |
|-------|----|--------------|----------------|
| Physical component for socialization | 0.516 | 0.266 | 0.107 |

| Alternative | Total squares | Df Average squares | F | Asymp. Sig (p) |
|--------------|---------------|-------------------|---|----------------|
| Regression | 12.300 | 5 | 2.460 | 1.669 | 0.018 |
| Remaining | 33.907 | 23 | 1.474 | 0.000 |
| Total | 46.207 | 28 | 0.000 |

Table 12. Two way anova spss.

| Model | Nonstandard coefficients | Standardized coefficients | t | Asymp. Sig (p) |
|-------|--------------------------|---------------------------|---|----------------|
| Control Variable | 5.644 | 1.817 | 3.107 | 0.005 |
| Security and Safety | 0.236 | 0.095 | 0.417 | 2.475 | 0.020 |
| facilities and services | 0.121 | 0.077 | 0.264 | 1.563 | 0.013 |

Table 13. Regression coefficients.
Table 14. Two way anova spss.

| Model                        | R    | R²   | Corrected R² | Standard Error |
|------------------------------|------|------|--------------|----------------|
| Physical component for socialization | 0.710 | 0.504 | 0.421          | 0.977          |

| Alternative | Total squares | DF | Average squares | F  | Asymp. Sig (p) |
|-------------|---------------|----|-----------------|----|---------------|
| Regression  | 23.292        | 4  | 5.823           | 6.099 | 0.002        |
| Remaining   | 22.915        | 24 | 0.955           | 0.977 | 0.002        |
| Total       | 46.207        | 28 |                 |       |               |

Table 15. Regression coefficients.

| Model          | β   | Standard errors | Standardized coefficients | t   | Asymp. Sig (p) |
|----------------|-----|-----------------|---------------------------|-----|---------------|
| Control Variable | 6.033 | 1.266           |                           | 4.765 | 0.000        |
| Comprehensiveness | 0.796 | 0.178           |                           | 0.649 | 0.000        |
| Comfort         | 1.083 | 0.108           |                           | 0.131 | 0.000        |
| Dynamism        | 1.065 | 0.205           |                           | 0.064 | 0.000        |

Table 16. Correlation test.

| Model  | Sociability |
|--------|-------------|
| Physical | Correlation Coefficients | 0.484 |
|        | Asymp. Sig (p) | 0.027 |
| Activity | Correlation Coefficients | 0.651 |
|         | Asymp. Sig (p) | 0.036 |
| Spatial | Correlation Coefficients | 0.715 |
|         | Asymp. Sig (p) | 0.021 |

Square in this set, due to its central and divisive role, is the basis for user contact and social interactions. The square provides the connection between the complex and the surrounding urban space, which is effective in the socialization of this complex. Studies have shown that spatial arrangement in cultural complexes can significantly affect the promotion of social interactions and sociability. The extracted data also show that among the mentioned cases, lightning has a significant effect on socialization.

Discussion and conclusion

Considering the importance of recreational-cultural centers and their important role in social interactions, effective spaces components in promoting socialization were analyzed. In this research, the components affecting the socialization of individuals were divided based on three parameters including spatial, physical, and activity. The influential physical components of form, sound, light, accessibility, esthetics, and ventilation suitable for this environment were identified, and activity components include a variety of defined activities and games and their health. Since many of the spatial features have
| Physical Component | Subcomponent | Field observations | User’s point of views | Expert’s point of view |
|--------------------|--------------|--------------------|-----------------------|------------------------|
| **Accessibility**  | Suitable location due to its proximity to the Rasht-Anzali Road | Proximity to Rasht city, Reduction of traffic | Away from the city and adjacent to the Rasht-Anzali Road, which has a variety of spaces |
| Entrance           | Proper retreat from the main road and create entrance spaces | Convenient and readable entrance | The number of entrances and exits has the desired capacity and quality |
| **Physical comfort** | The ground-level parking lot | Comfortable walking and good seating space | Pedestrian access to other parts of the complex is easily possible |
| Protection         | Enclosure complex and controlling the entrance of the complex | Enclosure complex and controlling the entrance of the complex | Prevent single people from entering and allow families to enter to create a safe and peaceful environment for families |
| **Lighting**       | Outdoor lighting is suitable but indoor lighting is inadequate | Good lighting at night and good indoor lighting | Paying attention to lighting to increase the security |
| **Form**           | A regular polygon with a central void | Attractive form and interior with a proper view | Using a central void to create an intimate space and ease of control and access |
| Movement pattern   | Circular movement and vertical access | Circular movement pattern | Arranging play equipment around the center in a rotating, circular, and radial motion pattern |
| Sound              | Outdoor silence, indoor bustle | Crowds and noise of play equipment | Has a variety of crowds and sounds due to the type of space use |
| **Furniture**      | Outdoor and indoor furniture is very diverse and colorful | Variety of furniture | Using a variety of furniture for different ages, signs, and boards for the safety and comfort of people |
| **Mechanical facilities** | Air conditioning in terms of high humidity | Summers are cool and winters are warm | Considering comfort due to high humidity and regular maintenance of the facility |
| **Facilities and services** | Existence of parallel functions such as cafes and restaurants indoors and outdoors | Restaurants and cafes | Providing welfare services |
| User diversity     | Has various uses such as tennis courts, volleyball, amusement park, bowling, and billiards | Entertainment for everyone | Creating a variety of entertainment for every type of people |
| **Existence of social activities** | Communicating with different age groups | Suitable for friends and family to do group activities | A space for activities and social interactions between children and even adults |
resulted from two other components, this has been combined with two other components in the research. The questionnaires were designed based on these three components and finally, by analyzing the data, the effect of each component on sociability was obtained.

According to the extracted data from the research, the quality of security and safety, which is due to the physical components of indoor space, proper lighting, and favorable access, has the highest score among the response of users of the environment. After security, the regularity of physical and activity components in this entertainment complex has been considered as the most effective components in the presence of people. As a result, according to the research hypothesis, the physical components of space have the greatest impact on the sociability of the environment. Among the components of activity affecting the presence of people, the existence of various games for children, parallel activities such as restaurants, and food courts have strengthened the quality of vitality and dynamism. Overall, Security as a spatial quality is known as the most important factor affecting the sociability of the cultural-recreational spaces of the case research. The results emphasize the direct impact of physical security components such as enclosure, visual accessibility, lighting, control, and monitoring.

This research furthers knowledge in the areas discussed above in three ways. Firstly, it cannot be ignored that a wide range of interesting academic articles has been published concerning public spaces, identity, and technology. However, what this research does is Providing a solution to preserve values with the development of the public spaces. Rather than looking at how an individual may manage their living areas, it looks at it examines the relationship between the components of cities to present and construct buildings, elements, or social spaces in a particular context. Secondly, the research takes ideas and concepts developed within the urbanism, architecture, and behavioral field and investigates if, and how, they apply to the more contemporary spaces, allowing for insight to be given into renovation or creating shapes of the modern cities. The third, and arguably the most exciting contribution to knowledge this research will make, is through its innovative design methodology. This research aims to collect data in such a way that not only will show the result of the design but unlike any other designing process, it will allow us to see how preserving and creating is constructed sentence by sentence and word by word. By recording the interaction of people in particular spaces, issues such as repair and correction can be seen in real-time. This will provide a unique insight into the impact of each change in the space and how it affects the whole relations and identities.

**Recommendations**

In conjunction with preview researches, our studies have shown that a major deterrent preventing people from participating in the security. Further researches should focus on comprising similar environment overlays to reach a more
comprehensive solution for future designs. Also, many places continue to be proposed, built, and managed without clear conceptions about what will happen in them and how they will be valued. Examining and matching these spaces with each other and with the example studied in this article will help to find accurate solutions for future studies. While this research is designers, developers and researchers should work more closely to find a way to create truly successful environments. Since this research was done by a group of architects and many of its aspects have to be done by experts in other fields, having a landscape architect helps to achieve a more accurate and comprehensive solution. Finally, the framework for shaping the environment and sociability could be altered depending on many factors; the authors would suggest to frameworks in every region should be examined separately to decrease the affecting parameters like cultural differences that do not vary in almost every region.

Acknowledgments

The authors would like to thank Farnaz Agahi (Shahid Beheshti University) for helping us with the revisions.

Annex

Friedman method: The Friedman test is the non-parametric alternative to the one-way ANOVA with repeated measures. It is used to test for differences between groups when the dependent variable being measured is ordinal. It can also be used for continuous data that has violated the assumptions necessary to run the one-way ANOVA with repeated measures (e.g. data that has marked deviations from normality). This test requires five or more patients.

1- Name the number of treatments $k$ (3, 4, . . .) and blocks (e.g. patients) $n$.
2- Rank the data within each block (e.g. rank the treatment outcomes for each patient).
3- Add the ranks for each treatment separately; name the sums $T_1$, $T_2$, . . ., $T_k$.
4- Calculate the Friedman $F_r$ statistic, which is distributed as chi-square, by (16.2)
   \[ F_r = \frac{12nk(k+1)}{T(k+1) + T(k+1) + T(k+1) - 3n(k+1)}. \]
5- Obtain the $p$-value (as if it were $\alpha$) from Table III ($\chi^2$ right tail) for $k - 1$ df.

Disclosure statement

No, the potential conflict of interest was reported by the author(s).

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