Explaining The Effective Features of Open and Semi-Open Spaces In Availability and Increase of Social Interactions in Residential Complexes

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ABSTRACT: By increasing house demand for living, the urban development planning has turned to towers, which provides a platform for the growth of the city, regardless of the traditional Iranian's architecture. Among the vital elements in traditional architecture, there are a variety of open and semi-open spaces such as the central courtyard, pool, veranda, balcony, etc that have been provided the needs for social interactions, privacy and other values among the inhabitants, but it is almost destroyed by the contemporary architecture. Therfore the necessity is to turn social interactions into spaces of residential complexes. Since in the variety of the quality of spaces, the architect has the most effective role, in a branch of interactive architecture, the most important thing is the interaction with the external environment that countless theorists have focused on this. The purpose is to explain the effective components of open and semi-open spaces in the presence and increase of social interactions in residential complexes. The research method was qualitative and based on the experts' descriptions, the characteristics of open and semi-open spaces were extracted and then their impact and interaction on the quality of space were investigated and adapted to the final model of interactive residential complex. Factors such as quality, security, the possibility of the presence of children, sense of belonging to the place and social discipline in different types of open and semi-open spaces, can have an effect on the adaptation of the spatial structure of residential complexes on the more interactions of residents.

Keywords: Features of open and semi-open spaces, Presence, Social interaction, Residential complexes, Quality of space.

INTRODUCTION

In traditional Iranian architecture, the need for social interaction and communication with peoples and the need for privacy are well discussed. Due to the diversity of human needs and the subsequent development of diverse open, semi-open and closed spaces, architectural design of residential complexes formed along the same neighborhoods is characterized by the quality of living. An architect can play a very effective and distinctive role in creating a variety of spatial spectrum. Accordingly, a branch of architecture, called interactive architecture, focuses on the quality of living in engaging with citizens, which has provided spaces for socializing their inhabitants. According to psychologists' perceptions, the spatial environment can attract a person who is primarily a supplier of the needs listed in Table1.

Completing activities in open space depend on the ability of the environment to attract people and increase their willingness to attend these spaces. Therefore, if space is appropriately designed in residential complexes, these spaces will play a decisive role in establishing communication and interaction between residents. Limitations in large cities have led to the expansion of residential complex construction and the reduction of private courtyard in contemporary architecture. In addition to providing lighting for indoor spaces and natural ventilation, outdoor living space is an opportunity to connect more with nature and a place for social interactions. Due to the limited space of residential units and the traditional history of the courtyard in Iranian life, open space is an oppotunity for

Table 1: Estimation of Human Needs Based on Theorists (Source: Daneshpour & Charkhchian, 2007)

Need		The impact on human interaction
Physiological and mental comfort		In relation to the basic human needs and how to respond to it, it influences how other qualities of space are perceived.
relaxation		Calm atmosphere, the presence of natural factors, space and control of vehicle entry
Active employment		Direct contact with the environment and direct experience of space, people and social activities such as: interaction with relatives, friends, acquaintances and neighbors, gathering, walking, playing, recreation, sports, physical activity, possibility of competition and ... It has a direct role in creating the desired mental image of people from space, dynamics and excitement, gaining new experiences and environmental education.
Inactive employment		Providing the ability to observe others and events around them
Discover and mystery		Creating diverse spaces and landscapes, various activities aimed at diversification, attraction and experiences and the creation of movement in space visitors.
Visual beauty and dimensions of beauty		Provide visual attractions and physical and emotional utility of space with factors such as order and coordination, space detection and many other factors.
Social utility		The social dimension of space; the presence of individuals and social groups and the extent to which they interact with each other
Safety	Space visibility	Despite various activities and planned events aimed at increasing and sustaining the presence of people in space, visual permeability, readability, space clarity
	Peripheral perception	Appropriate lighting, visually impaired lines, elimination of unsafe areas and existence of signs
	Space control	Using various mechanical forms (by camera, gateway, etc.), natural (definition of space and territory) and organizational (police, guardian, etc.)

expanding the function of the indoor space and its relationship with the outer space. Therefore, reviewing and recognizing the current state of open space is the basis for more informed design of open spaces in the future.

In global studies, many actions have been taken around the collective life of humans, which are based on the thought of returning to the natural life of the past, and the purpose is to encourage people to live in social life, to promote social life, to provide a coherent life experience group based on democracy methods, improvement of collective activities, the association of humans with the external environment and the achievement of a high level of social sustainability. Examples of these measures include residential complexes called cohousing (McCamant & Durrett, 1989), multifunctional complexes and apartments with green spaces. As the idea of life is shaped and implemented, studies and researches have been done to strengthen social communication between humans and the relationship between internal spaces and outside environments and activities that take place (Festinger et al., 1950; Nozari, 2004; Daneshpour & Charkhchian, 2007; Kashanijo, 2010). Another group emphasized the importance and impact of playgrounds and parks on increasing social interactions of open spaces in residential complexes (Pakzad, 2005), hich has been interesting for children. There are also countless studies on the effective role of residents' sense of satisfaction in feeling more attached to the environment as a result of establishing contacts and social interactions (Asqari et al, 2004; Jason et al., 2015).

In recent years, Iranian scholars have increasingly emphasized the importance of enhancing availability and thus increasing social interactions in residential complexes. In different types, these studies have pointed to factors such as need for privacy, physical features of visual environments, the role of open and

semi-open spaces, functional and physical characteristics of open spaces, and the impact degree of each in promoting the social interactions of residential complexes.

In Ghaffari & Iranpanah & Shahbazi's research (2013), they discussed the open spaces of residential complexes for social interactions. The purpose of this paper is to identify the architectural and environmental factors involved in residential complexes in order to provide an arena for social interactions. For this purpose, the comparative correlation method has been used. The effective factors in this research include the functions of space, attention to proportions, human scales, path safety, continuity of readability, environmental comfort, proper physical opportunities for sitting, focal areas for gathering such as playgrounds, access control of vehicles. It was found that influential factors in the center of neighborhoods can be referred to as calm, intimate, and cozy. It seems that a sense of satisfaction with an environment has a direct relationship with the sense of belonging to the environment and they feel more relaxed in being in the environment (Ghaffari et al., 2013).

In another study, Valiani, Gharaati & Shahbazi (2017) examined the impact of social domains on social interactions. The main issue of this paper is that, due to the lack of prediction of human-scale spaces and the excessive presence of cars, cities are causing tumultuous congestion rather than being able to engage in social interactions. This paper discusses the impact of social interactions on creating a sustainable society. An analytical descriptive approach has been used to examine this issue and it has been concluded that a proper physical environment should be considered in order to achieve sustainability of human relationships in the society. Population density in buildings has reduced social activities among people. To improve this situation, solutions such as increasing

the amount of open space relative to the occupation level can be used, and the open spaces of the residential complex can be located on different scales between blocks and neighborhoods that prevent disturbance in the privacy of residential units (Valiani et al., 2017).

Samadi Fard et al. (2013) studied the role of open spaces in residential complexes as one of the factors of social sustainability. Nowadays, these complexes, without paying attention to psychological needs, have only fully satisfied their physical needs, ignoring the fact that neglecting psychological needs such as social interactions, privacy, etc., increases social anomalies and, consequently, reduces urban security. Based on previous studies, the theoretical framework of the research is presented in Fig. 1 (Samadifard et al., 2013).

Residential Complexes

In the second half of the nineteenth century, the emergence of industrial revolution was the beginning of a new history and brought great changes in the process of urbanization. At that time, there were two different functions in the cities; first, the separation function that was assigned to a particular region in the city, such as residential, industrial, and etc, and the second, the combined function of integrating different activities in a particular region, for example, residence with trade and etc. The emergence of regions with combined function was dominated the separation function, and the lower and middle classes of the community lived side by side. It was uncontrollable, interconnected and intolerable in terms of health, safety and well-being, and for this reason the first construction law was drafted at that time (Dalalpour, 1996).

Residential or apartment complexes are said to be high-rise buildings that are built in multi-stories and usually have residential or office-residential or multi-user applications. This type of buildings have been replaced by one or two story villas due to the growth of population. With the expansion of the community in relation to centralized construction, the central spaces of the neighborhoods and public spaces in each residential area are rarely removed and replaced by an open space for residential complexes. The open space of the complexes is trying to meet the psychosocial and physical needs of individuals.

The concept of community, availability and social interaction

Society is the gathering of human beings within a certain range, although this gathering in its more developed levels requires commonalities such as language, ethnic memory, beliefs, and mythologies, but primarily in the reflection of biological level of the universal notion and first of all, a geographic location is a place for people to come together. The community reflects the biological level of human beings (Bacon, 2012). A space that is private or public and is aimed at availability.

Social communication takes place through a variety of activities in the environment, most notably: conversation, meeting, birthday, public events, games, sports and recreation. Some of these activities are simple and special, such as walking, standing up and sitting as well as seeing and talking. These basic activities are considered to be the starting point and will continue to expand for other activities such as sports and games, etc. The performance of these activities in the public space depends on the ability of the environment to attract people and increase their willingness to attend these spaces. These activities can be categorized in the following conceptual model (Yazdanfar & Zaroudi, 2011).

Activities such as interacting with others and observing the activities of people, by creating socialization backgrounds, help to develop a person's personality. Communication, exchange, actions, and reactions that bring a person to a satisfactory balance with his habitat, and man finds his balance with the environment in physical, psychological, material and spiritual communication.

Social interaction means creating a relationship between two or more people that will lead to a reaction between them, and this reaction is well known to both parties. Social interaction can be a conversation or a relationship due to the role of people in space and their membership in social networks (Behzadfar & Tahmasebi, 2013). In the past, social relations were largely confined to face-to-face relationships; cultural branches rarely grew out of the realm of social life. Cultural changes were negligible, and the need for human identity was provided, but as the community progresses, human communication takes on even more complex forms (Toloei & Khaghani, 2015). Public spaces can shape these relationships and lead to social interactions. For this reason, these spaces have a significant role in the collective life of the inhabitants. In these spaces, there has been a chance that some boundaries would be broken
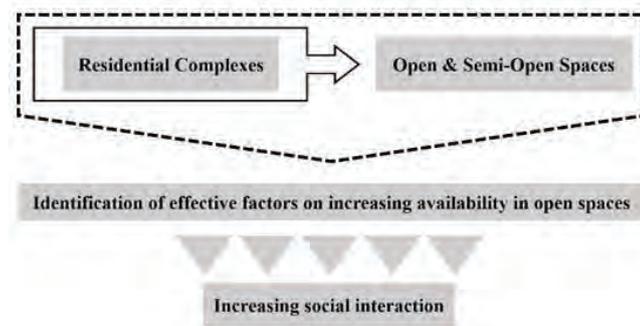

Fig. 1: The overall theoretical framework (Source: Samadifard et al., 2013)

and unconsidered encounters occur and people interact in a social setting (Behzadfar & Tahmasebi, 2013).

Open and semi-open spaces for residential complexes

Space is a central concept in architecture that is always in conflict with the concept and quality of architecture. In other words, space is composed of places with specific boundaries, each of which alone has its own social relations and identity (Mansouri & Torabi, 2015). Open spaces have a great role in the human life of the past, in which individual and social behaviors have taken place in different dimensions. In recent years, in many cases, open space has become a place for passage. These changes, and the reduction of the role of open spaces, in addition to affecting the aesthetic aspects of architecture, affect the physical and psychological aspects of users and, in particular, special classes, such as children, elderly And women who spend most of their time in residential spaces and open spaces (Alalhesabi & Rezaee, 2008).

Public spaces of residential complexes are spaces that are related to public utilities and include open space and common spaces. Public spaces should be designed in such a way that meet the diverse needs of social groups in all age groups. Establishing a social relationship is one of the requirements of collective life. Social communication is carried out through a variety of activities in the environment, the most important of which is presented in Table 2.

Some of these activities are simple and special, such as walking, standing, sitting, and seeing and talking. These basic activities are considered as the starting point and continue to provide a platform for growth and development for other activities such as games, sports and social activities (Gehl, 2013). The pursuit of these activities in the public space depends on the ability of the environment to attract people and increase their willingness to attend these spaces. Therefore, if space is appropriately designed in residential complexes, they play a decisive role in building communication and interaction between residents. Constraints in large cities have led to the expansion of residential complex construction and the reduction of yard's share of contemporary architecture. In addition to lighting of indoor spaces and natural ventilation, open space is an opportunity to connect more with nature and a place for social interactions. Due to the limited space of residential units and the traditional history of the courtyard in Iranian life, open space is a place for expanding the function of interior and its relationship with

outer space. Therefore, reviewing and recognizing the current state of open space is the basis for more informed design of open spaces in the future (Einifar & Ghazizadeh, 2010).

MATERIALS AND METHODS

TheImportance of Research

Man is a social animal. Society plays an important role in determining physical, psychological, behavioral and attitudinal factors. Perception, values and expectations are also greatly influenced by the society where an individual belongs to. The role of social support enhance particularly in case of disablement, pain, anxiety and loss of income of a person. It ultimately reflects on the person's various domains of quality of life of a person. It has been seen that supportive social interactions is related to higher quality of life in all of the four domains (Yanos et al., 2001).

Social interaction means creating a relationship between two or more people that leads to a reaction between them, and this kind of reaction is known to both parties. Social interaction and communication can be a physical issue, a look, a conversation, and a relationship between individuals, which itself involves defining appropriate events and activities and, consequently, the role of people in space and their membership in social groups and networks (Daneshpour & Charkhchian, 2007). Social interaction has a significant role in improving the quality of life of elderly. The social interaction helps elderly in preventing their loneliness and thus improves their mental health. By sharing their feelings the elderly people can help each other in improving their quality of life. They can find the meaning of their life.

By increasing population and house demand for living, cities have faced a shortage of land for construction. As a result, urban management system and city development planning turned from horizontal expansion to vertical elevation, and this approach went so fast and quickly that there was no chance to adapt the thoughts in the traditional architecture of Iranian people with their architecture. The presence of a central courtyard, the need for social interaction and communication with peers and the need for privacy are values in our traditional architecture that is not seen in contemporary architecture. Therefore, in the process of compression of residential houses, the proportion between the basic needs of humans and the responsive spaces is eliminated. Among the threats and concerns of residential

Table 2: Classification of collective activities in residential complexes (Gehl, 2013)

Activity	Activity-related need
Conversation	The need for people existence, attention of people in the environment, experiencing, aggregation
Meet	The need for a pre-scheduled meeting, waiting in a certain space
Passage, sports and games	The need for walking, moving, health and vitality
Public ceremony	Holding ceremonies and celebrations, common meetings
Recreation	The need to spend time

compact collections can be the lack of participation of residents in solving problems, which can contradict the thoughts or social encounters between them. Therefore, the necessity of research is to turn social interactions into open and semi-open spaces of residential complexes.

Balesian methodology (Bales, 1950) identifies three positive social emotional interaction categories: showing solidarity, showing tension release and agreeing. Participants contribute turns of these categories to address the problems of reintegration, tension release and decision respec-tively (Kumar & Rose, 2010).

Questions and Hypotheses

Based on the need to be available to increase the desired social interactions, the research questions are;

- What is the relationship between open and semi-open spaces of residential complexes and social interactions?

-What are the components that affect the availability and increase of social interactions in residential complexes?

In this study, it seems that there is a direct relationship between the quality of open and semi-open spaces of residential complexes and the increase of social interactions. Whatever was in traditional Iranian architecture, was the presence of open and semi-open spaces with the characteristics and desires of the residents, who felt the sense of belonging to the place and because of inadequate development, the sense of belonging to place weakened and changed the feeling and imagination of people from the place. It is also assumed that physical, social, and psychological components such as quality, safety, the presence of children, social order and ... affect the availability and increase of social interactions of residential complexes.

Purpose, Variables and Procedure of Research

The purpose of the research is to explain the effective components of open and semi-open spaces in the availability and increase of social interactions in residential complexes. In this regard, study of factors such as quality, safety, the possibility of children presence, the sense of belonging to the place and social order in different types of open and semi-open spaces, can help to adapt the structure and spatial structure of residential complexes to the culture of collective life and more interactions of inhabitants. According to the research objectives and based on expert opinions, open and semi-open

spaces can be identified as an independent variable, and the availability in residential complexes and social interactions are dependent variables. The method of this research is qualitative. In the first stage, based on theories and testimonies of experts, components and characteristics of open and semi-open spaces were extracted. Then, the effect of these features on the quality of the spaces was investigated and the final model of the residential complex and the characteristics of open and semi-open spaces were applied.

Analysis and Review of The Oretical Foundations: Features of Open and Semi-open Spaces inResidential Complexes

In the design of open space, residential spaces should identify the diversity of age groups and people's desires. The designer's responsibility is to provide residents with opportunities to adapt to the process of physical and mental development with greater comfort and self-esteem.

Residential complexes consist of open and closed spaces combination that are interconnected. In terms of urban structure and landscape, open spaces are important as an inseparable part of residential complexes (Marcus & Sarkissian, 1986). Yangel focuses his research on the interaction of sociological issues with public spaces. In his book, Life Between Buildings, social activities are considered as one of the basic activities in open spaces (Kashanijou, 2010). He believes that the role of spaces in the formation of visits and social activities have a significant effect (Gehl, 2013). In fact, open spaces in residential areas create the nature of collective life and provide a place for growth of creativity, socialization, social interaction and interaction of residents (Nozari, 2004).

Analysis and Review of Theoretical Foundations: The Efective Components of Open and Semi-open Spaces in Availability and Increase Social Interactions

In Iran, the confidentiality of individuals is important, and networks of hierarchy of confidentiality include urban space. In addition, the existence of hierarchies from the public space of neighborhood to the private space of residential complexes induces strangers to enter a place in the realm of particular people that may be under supervision of inhabitants and provide security (Tabibian et al., 2011).

In Fig. 2, these components are referenced. Among the above features, factors such as provision of territory, readability, etc.,
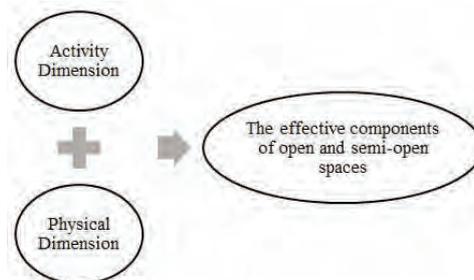

Fig. 2: The effective parameters of open and semi-open spaces in increasing the social interactions of residential complexes (Source: Daneshpour & Charkhchian, 2007)

refer to physical dimension and factors such as acquisition of environmental knowledge and experiences, the presence and social interaction refer to space dimension (Daneshpour & Charkhchian, 2007).

Physical Characteristics

The space activator is primarily a body that can trigger the entry and then stop people in space. Therefore, accesses, visual attractions, natural factors, etc. should be considered. The body of the complexes expresses their identity, it can be concluded that the identity and social class of individuals as well as the social identity of residential complexes are dependent on the architecture of the building (Zarghami, 2010). In Fig. 3, physical factors influencing social morality are examined; Physical qualities of a common open space is related to access, location, physiological comfort in different climates

and security. In addition, the presence of natural elements in public spaces that increase the excitement and vitality of the environment and invite pedestrians to these spaces and provide rest, pleasant experiences and more health for people is also very important. Elements such as memorials, stairs, fountains and other influential factors in encouraging humans to engage in space are among the factors contributing to the promotion of the physical aspects of public spaces. The qualities of designers such as space integrity, dimensions, proportions, flexibility, form, geometry, materials, enclosures, bodies, physical and spatial association, the presence of natural elements in space can also be effective in perceiving space as a whole. (Pakzad, 2005). Therefore, the physical dimensional characteristics of space are described in Table 3;

Physical factors have a great influence on increasing the satisfaction of life and belonging to the place. By providing
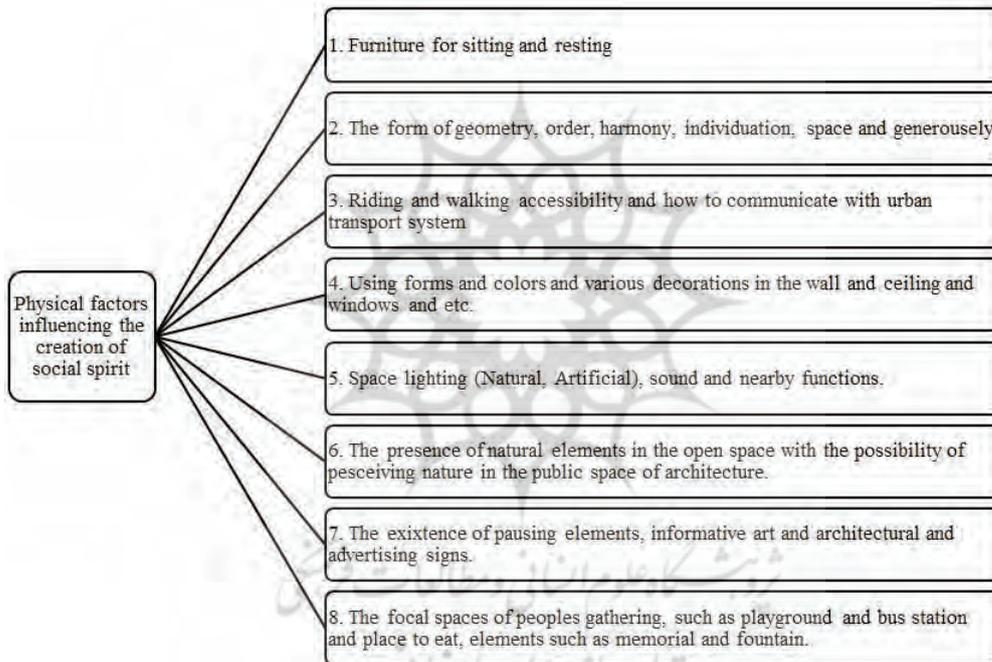

Fig. 3: Effective physical factors in socialization (Alitajer et al., 2016)

Table 3: Physical dimensional characteristic of space (Source: Pakzad, 2005)

	Index	Architectural Design Solution
The Physical Dimension of Space	Space hierarchy	Taking into account private, semi-private-public and public privacy
	flexibility	Set the space time schedule for a variety of long-term and short-term use
	Form of geometry and proportions	Designing optimal and desirable forms and creating spatial and physical grace
	Quality of materials	The use of high and native quality materials based on the region's climate
	Confinement and physical continuity	The definition of specific territories as a result of formation of a general privacy
	The presence of natural elements in space	Definition of vitality and spatial vitality with various green and vegetative factors

Table 4: characteristics of space activity dimension

	Index	Architectural design solution
Space activity dimension	Spatial Confidentiality	Define solitude and privacy to enhance the sense of belonging to space
	Convenient space facilities	Designing optimal spaces based on diverse human needs
	safety and peace	Establishing environmental comfort and social environmental discipline
	Environmental experi-ences	Variety of space design for more people and increasing the availability of the region
	Spatial identity	Predicting and Designing the Native Region Identity
	Presence in the community	Promote social interactions by designing various spaces for people to communicate with each other

utility in accesses, more attraction is found in pedestrian access than on ride. This creates the ideal combination of mass and space, the layout of the blocks in proportion to each other, the orientation of space and open space, the aesthetic combination between the mass of buildings and urban space. On the other hand, the urban landscape of residential complexes will be effective in coherence and unity, harmony with the texture of the surrounding area and adornment of the facade. Also, amenities, services, sports, playgrounds and multi-purpose spaces for children and the green area are very effective in the desirability of open and semi-open spaces and the sense of vitality in space. Therefore, open spaces should be designed in a way that is capable of playing and spaces such as parking lots, especially guest parking lots as well as other multi-purpose spaces, should be scheduled in the form of multi-functional and a second function for play and recreation of children should be considered (Zarghami, 2010).

Activity Indicators

Functional specifications of public spaces can affect the quality and quantity of people involved in interacting in these spaces. enough space to sit and meet certain events in space, such as street shows, public arts, and events such as the one that links people, adds to the charm of these spaces. Studies show that public spaces are more appealing to people, where people can work in the environment by looking at others, sitting, eating, doing sport activities and cozy events. These activities and many other characteristics of activity and other areas, distinguish the public spaces and affect the provision of comfort and the possibility of people enjoying the space. In addition, only

spatial spaces are successful in terms of social interactions, which support dynamic interaction, environmental education, the free exchange of information in the form of presentation and training of skills, acquisition of environmental experiences, the possibility of creative expression of individuals and groups, which leads to increased social solidarity and more satisfaction. In Table 4, the characteristics of space activity dimension are examined;

RESULT AND DISCUSSION

According to previous studies about the role of open and semi-open spaces of residential complexes in increasing availability, human dimensions and human activity in public spaces have been more and more considered by urban planners, and people are eager to attend and participate in such spaces. Therefore, the creation and design of a successful public space requires the utilization of social power of space and promotion of participatory opportunities in the collective space, and ultimately requires the recognition of its space and its various dimensions, and multilateral look from the city designers and planners.

In Fig. 4, the research hypothesis suggests that there is a direct relationship between these spaces and increasing social interactions. One of the characteristics of activity is homogeneity of social, economic and cultural conditions of residents of residential complexes, which will create the necessities and needs of the community as well as provide the desired spaces based on those needs. In addition, paying attention to the needs of different age groups, especially the elderly and children, who make up the majority of the audience's
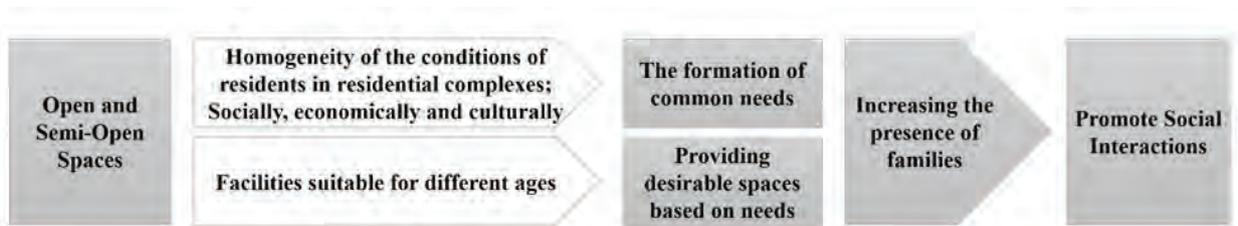

Fig. 4: Research theory based on the hypothesis of relationship between open and semi-open spaces and social interactions

Table 5: Effective parameters of open and semi-open spaces in residential complexes on the interactions and viewpoints of researchers

Space features	Availability process	How to approach	Results of social interactions
Social homogeneity of inhabitants	Shaping common need	Activity social, psy-chological	The presence of families in open spaces of the complex
Attention to the elderly and children	Most audiences		Residents Satisfaction
Scenic green spaces	Visual comfort		Create focal spaces
Design patterns and ideas	Secure and attractive conditions	Physical, environ-mental,	More residents on sites
solitude and privacy	Private territories		An obstacle to the mental feeling of congestion and tension
Varied types of open spaces	Various function		Environmental modification and behavioral adaptation
Flexibility, readability	Adding functional elements		Easy orientation, clear definition of boundaries of activities

share of open and semi-open spaces and the availability of age-appropriate facilities, provides an enabling environment for the presence of more families in open and semi-open spaces. This process increase the availability and social interactions of inhabitants at the complexes.

According to the research process, meeting the social needs of human and providing the optimal opportunities for gaining his social experience, requires the existence of physical space. Therefore, open and semi-open spaces have the potential to respond to this aspect of human life in residential complexes, which can be achieved by designing the characteristics defined. One of the most important dimensions and characteristics of open and semi-open spaces is the creation of opportunities for social interactions. As people interact with each other, they will feel stronger with their place and society. Strengthening the sense of belonging to the place and increasing availability is directly related to the formation of various age groups and life in various hours of the day. Social events, space applications, space ability to attract audience and age groups, space visibility and physical-visual access of space, the continuity of movement and the presence of special social groups such as children and the elderly, availability of sufficient parking lots and favorable connection with urban transport system can be the most important factors in the dynamics and vitality of open and semi-open spaces.

Physical features such as space hierarchy of private and public privacy, solitude, flexibility, readability, visual effects, geometry and form, materials, color and texture, access and signs can also be more effective than active features in the process of increasing social interactions. By defining a variety of private and public domains, designing safe spaces, different types of green spaces, and exploiting functional elements, one can point out the desirability of accessing, navigating, and designing clear boundaries of activities that enhance readability. Also, spatial and functional flexibility in open and semi-open spaces has led to an increase in the number of applications pertaining to a type of space that each user having a specific time to exploit. When residents can use a variety of space, the duration of use will increase and cause more resident's exposure, resulting in social interactions. Due to the climate of region and the arrogance of architects in the use of indigenous materials, shapes and attractive spaces are formed that bring spatial vitality and high utilization of spaces. In Table 5, the components of open and semi-open spaces that are effective in increasing visibility are extracted in two features that include activity and physical attributes.

CONCLUSION

Based on the results of studies, availability in residential complexes has been very effective in predicting green spaces such as parks, service spaces and residents' satisfaction from the security of the complex in the social belonging to the place and eventually increasing social interactions. In previous studies, the role of designer has become important as a tool of meeting human needs and has led to the creation of necessary goals such as securing privacy, stabilizing the visual environment, creating open and semi-open spaces. In the pursuit of goals, availability in the environment, in addition to the messages, meanings and codes that people have given to their interactions, will increase with the strengthening of physical factors of the environment, activities, perceptions and reactions to it. With this approach, it is possible to present and interact with today's complexes that have almost lost their social identity due to lack of public spaces.

The social dimension of public spaces is based on a triangle of human, space, and collective life, which is the response to social interaction based on the recognition of characteristics and needs of each. In this research, first of all, human beings and their need for collective life were examined and then open and semi-open spaces were defined and the features that could be effective in increasing social interactions were extracted. Finally, the effect of these features, as presented in Fig. 5, is one of the desirable results sought by this article;

We can promote communication between people by creating a public space in the heart of building and placing a part for gathering of residents during the evenings. The combination of functions for creating spatial unity and various semi-private, semi-public, and public spheres are considered as mainstay
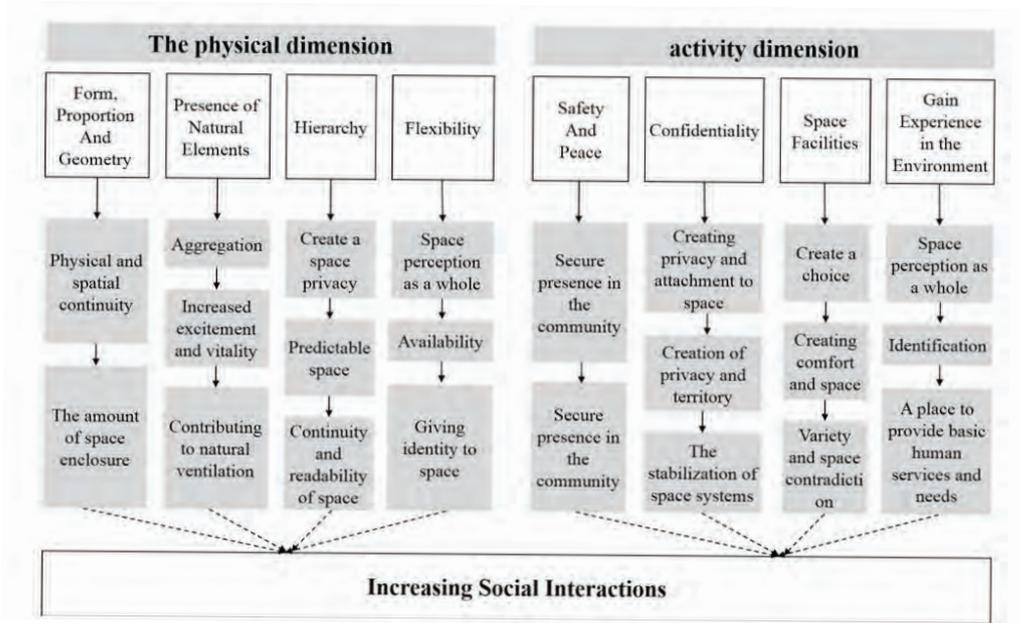
Fig. 5: Adaptation of open and semi-open spaces for increasing social interactions

Table 6: Physical and activity dimension approach of open and semi-open spaces of residential complexes in improving quality

	Activity dimension	Physical dimension	Spatial quality	Final result
Matching physical and activity dimension as a result of spatial quality	Production of field, privacy and territory in creating privacy and attachment to space	Physical continuity and spatial confinement by utilizing form, geometry and proportions	Consolidation and belonging to space	Increasing social interactions
	Recognizing social identity with desirable and safe application	Spatial flexibility and space perception as a whole and establishing order and relaxation	Psychological and social security	
	Availability of facilities for providing services and basic needs	The presence of natural elements and interaction with greenery helps to air conditioning and increase the presence of humans	Aggregation	
	Stabilization of space systems with age-appropriate applications	The design of space hierarchy and creation of a coherent structure	Giving identity to space	

of social interactions. The results of research indicate that if feeling of satisfaction is higher than the environment, people feel more attached to it, they feel more relaxed and, in the end, the relationships in the environment are warmer and the impact of the environment on individuals will increase . As long as the open and semi-open spaces have a diverse identity and function based on the needs of the residents, there are attachment and psychological security to space.

Based on the necessity of research, since living in residential complexes is inevitable for many people, it is necessary to find solutions that add to quality of life in these environments. Considering what is presented in Fig. 5 and Table 6, creating and increasing social interaction of residents is effective in improving the quality of life and will make life more enjoyable for residents. The conditions for interacting in environment can improve it, which means that the environmental and social conditions prevailing in complexes must provide space for the individual and communicate easily with the individual. The qualitative results of this study indicate that the link between people is affected by environmental factors and these factors affect the rate and manner of social interaction.

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