Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

On the effective characteristics of open and semi-open spaces in housing compounds in social interaction

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A B S T R A C T

The purpose of this study is to investigate and compare the architecture level of social interaction based on open and semi-open spaces characteristics, physical and spatial structure of residential complexes. In order to achieve optimal results, the literature review and case study technique has been used to analyze the obtained information of the theoretical principles. Finally, by exploiting the characteristics of open and semi-open spaces, appropriate design solutions in order to increase social interactions in complexes have been proposed.

1. Introduction

Organizing factors of the city in the various stages of their relationship with humans and the environment is the first important principle in the planning and design of residential complexes. Fine cities in the past were always had a main distributed function. For example, in Iran's traditional architecture, a hierarchical system was starting from a massive scale (Gate, square, street, alley, passage and impasse) including diminutive scale (Entrance, vestibule, corridor, court, atrium, porch, interior, bedroom and closet) and even including public spaces, such as the galleria. But nowadays most of the cities and buildings have lost their clarity design in interior and exterior order.

Lack of attention to privacy and spatial varied range are the factors that disrupting the discipline. So, in this process by studying the human as a social being containing various qualitative and quantitative levels of social interactions, understanding the behavioral bases and social events and potential activities is important for social actions and meaningful relationships so identifying open and semi-open spaces that satisfy the necessity of human is preferred.

1.1. Materials, methods and research questions

The aim of this study was to investigate the role of architecture in the social interactions, matching the body and spatial structure of residential complex on culture of social life and resident's interactions. In order to achieve optimal results and to provide an appropriate response to the aim of this study, the library studies has been used and by Using descriptive and analytical methods and case study techniques to analyze the information obtained in the implementation of theoretical principles and finally, by exploiting the features of open and semi-open spaces, appropriate design solutions for residential complex have been proposed in order to increase social interactions.

In this part, it was assumed that the desired characteristics of open and semi- open spaces in traditional architecture of Iran is important to putting the residents together and having the sense of place. The purpose of this study is to restore identity and more social interaction into open spaces and public housing complexes. Therefore one of the research questions is to highlighting the characteristics of open and semi- open spaces of the Iranian traditional architecture, and the other is implementation of their effects on increasing social interactions.

2. Evolution of residence in Iran

Residence shows the location, authentication and establishing a meaningful link between humans and a given environment that this link is the result of trying to find identity, the sense of belonging to a place, so, if human resides and have stabilized the existence of itself in the world, only then he could find himself.

The way of living in Iran in the past took place around enclosed courtyards that define life in terms of surround and porch and its affiliates rooms around the courtyard were ring. Courtyard enclosed

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by walls and the porch was a supplier of security and household welfare. Imported architecture were introduced in the first step for single element homes that courtyard or its private open spaces were ring on the opposite direction of residential unit and then privacy of these open spaces were surrounded by high walls and a kind of outward-oriented architecture was replaced.

Development of apartment buildings in urban housing architecture in Iran introduced a new element that appeared as balconies and actually replaced by private open spaces. Various urban facilities were inconsistent with number of population and discipline of inside and outside of cities and buildings almost broke (Fig. 1).
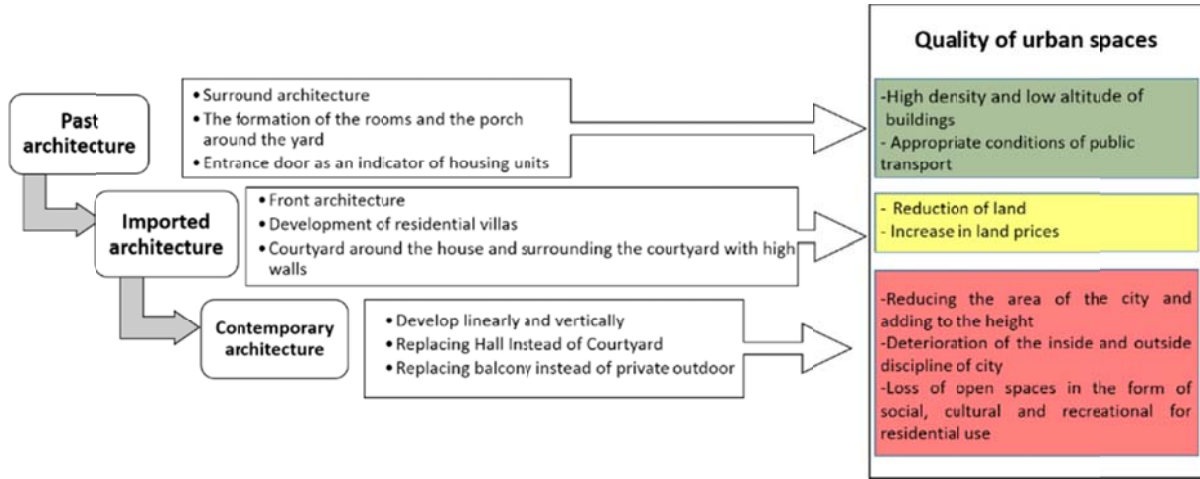

Fig. 1: The evolution of living in Iran

Irregular migration of villagers caused cities faced with the problem of shortage of land. Build high-rise residential complexes was a solution to compensate for the shortage of land. The main advantage of living in this way is that a lot of people accommodate in the lowest area and in the form of

several levels and mass residential units, something that could be considered inevitable in the current situation. In diagram 2, residential complexes due to their rapid entry to Iran and its consequences have been investigated (Fig. 2).
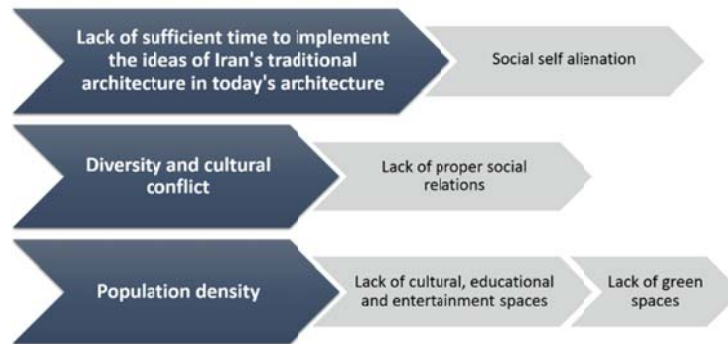

Fig 2: Review of residential complexes problems

2.1. Architecture and social interactions

Humans created as social beings and forced to meet their own needs as a group and by interacting and communicating with other people. Social interaction is a relationship between two or more people which leads to a reaction between them and this type of reaction is known to both sides. Social interaction and communication can be a physical subject, a look, a conversation and communication between people, which requires the definition of appropriate events and activities and thus their role taking into space and membership in groups and social networks. But what we are witnessing today in communities of people is reduction in communication. Sufficient knowledge of human and the relationship with others can be effective in

forming the environment for more communication and interaction.

Different people tend to have different levels of social interaction. The definition of an optimal level of interaction, achieved mentally from statements of people and objectively from normative stance toward a good life. Both definitions are high-value with social and political orientation (Lang, 1987). Observations show that low levels of social interaction occur between different generations. Public spaces have the possibility to gather different generations. A sense of place means different things to different people. To some, it derives from shared memories, experiences, traditions, and history (Salvesen, 2002).

Undoubtedly, our interactions with others play an important role in the habitat priorities and built

environment should respond to the needs of these relations. On the other hand, we know that spaces impose specific social roles to their residents and strengthen some patterns and behavioral standards and weak the others and finally give new direction and dimensions to the behavior of their inhabitants.

By turning to the concepts and with a view to the architecture of the past we realize that architecture requires social interactions and communication with each other and privacy that well responded; So that appropriate supply, definition and clarity of private, semi-private and public areas with increase in social interactions were considered. In environmental design theories, there are statements about the impact of design on social interactions.

By looking at social interaction patterns and capabilities of the built environment we understand that as much as the environment design and its constituent materials affect loop behavior communication channels, built environment also affect human social processes.

For example, providing human's need to love and being together requires a physical settlement and public spaces are the most capacity in this regard, but it would not be possible without responding to basic human needs. Space can attract people which primarily supply the requirements in Table 1.

Table 1: Human needs estimation

The impact on human interaction		Need
Meeting this quality was in relation to basic human needs and how to meet them affects understanding other properties of space		Physiological and mental comfort
Quiet space, presence of natural factors, space privacy and vehicles entry control		Resting
People's direct contact with environment and direct experience of space People and social activities are such as interaction with relatives, friends, acquaintances and neighbors, meetings, walk, play, entertainment, sport, physical activities, and is possibility of competition and ... Which plays a direct role in creating a favorable image of the space, dynamism and excitement, new experiences and environmental education.		Active employment
Allowing viewing and watching others and things and events surrounding		Inactive employment
Creating spaces and various perspectives, different activities to provide diversity, attractions and various experiences and making visitors move in space.		Discovery and mystery
Provide visual Attractions and desirability of physical and emotional space with factors such as discipline and coordination, determination and diagnosis of space and many other factors.		Visual beauty and aesthetic dimensions
Based on social space dimension that means presence of different social groups and amount of social interactions between them		Social acceptance of people interaction
Despite the various activities and events planned by the aim of increasing and sustaining the presence of people in space, visual influence, readability, space clarity	Visibility of space	Safety
Reach to, appropriate lighting, free sight lines, remove unsafe areas and the presence of signs and symptoms	The possibility of environmental perceptions	
Using various forms of mechanical (by cameras, gates, etc.), natural (definition of space and territory) and institutional (police, guards, etc.)	Location control	

By these history, human needs to belonging the place. Sense of place is a concept which is changing a typical space to place with special behavior and sensory characteristics for certain people. It meant connect to place by understanding of everyday activities and symbols associated to it. This sense can be created in an individual living place and be expanded along him or her life (Relph, 1976).

Sense of place is a mixture of conscious and subconscious feelings and perceptions. It is a rich concept that incorporates how people perceive, experience, express and give meaning to a place. An individual's sense of place will influence their attitudes and behavior within that place (Parsa and Torabi, 2015).

In the interpretation and basis of the sense of place the stability and source of identity could be paid. In this case place is defined by the collision of people and their interaction. Always use these interactions and dynamics; change the physical environment can make the comfortable life (Massey, 1994).

2.2. Effective position of open and semi-open spaces in residential complexes

Human activities are due to his needs. Public spaces should be designed to meet the varied needs of different social groups in all ages. Social communication is necessary for social life, which is considered one of the requirements. Social communication is done through a variety of activities in the environment that most important of which are (Table 2).

Some of these activities, while simple, are more specific, such as walking, standing, sitting and watching and talking. The basic activities are considered as a starting point and then for a variety of other activities provide growth and development, such as games, sports and social activities, etc. Performing these activities in the public spaces

depends on the capability of the environment to attract people and increase their willingness to

participate in these spaces.

Table 2: Classification of social activities in residential complexes

Need related to activity	Activity
Need for existence of people, Attention to people in the environment, experiencing, the accumulation	Conversation
Need to pre-planned meetings, waiting in special space	Meeting
Need to walk, move, wellness and happiness	Traffic, sport and game
Festivities and religious ceremonies, joint meetings	Public events
Need to spending leisure time	Entertainment

Therefore, by proper design of residential complexes, these spaces play a decisive role in the interaction between the residents. Restrictions in major cities, led to the development of residential complexes and reducing the share of private courtyard in contemporary architecture. Residential open space in addition to provide lathing interior spaces and natural ventilation, is an opportunity to connect more with nature and a place for social interaction. Due to limitations of internal space of housing units and traditional history of the yard in Iranian life, open space is an opportunity to extending the functionality of the interior space and its relationship to outer space. Therefore, reviewing and identifying the status quo of open space, is required by more conscious design of residential open spaces in the future (Fig. 3).

By growing the dimensions of the vault and expanding the area of the house, they were not able to cover the middle of space and the space was converted into yard. In order to ensuring security and establishing privacy and comfort in the center of the house, open space located in primary homes. Courtyard is the main open space of the house. Apart from the courtyard, there are a variety of open spaces at different heights and by semi-open spaces with an interface such as the stoop, vault and patio, inside and outside space combined and expanded. In some seasons, a lot of interior functions such as sleeping, eating and living are transmitted to the courtyard.

Presence of trees and water in the courtyard was required so that the yard is a summary of heaven at Iranian's home.
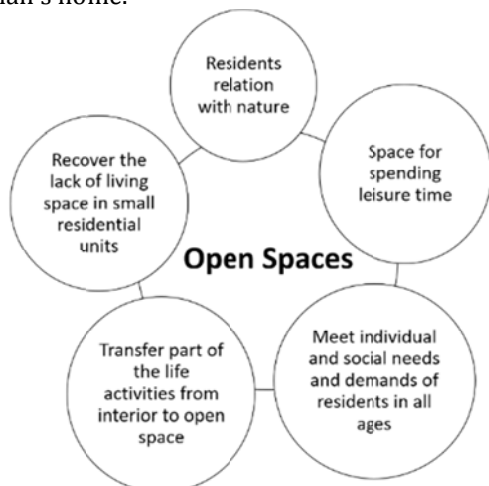

Fig. 3: Features of open spaces

Existence of multiple inner and outer courtyards is a response to the needs of the hot and dry climate and also is a response to the Muslim community's traditions of hospitality, while complying with the principle of privacy (Fig. 4).
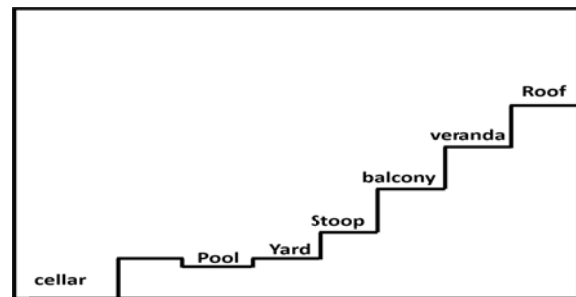

Fig. 4: Various open spaces in different levels in Iran's traditional courtyard (Haeri Mazandarani, 2009)

2.3. Characteristics of open and semi-open spaces in residential complexes

One of the basic principles governing the categories and components and phenomena in the universe, either designed or created as a whole naturally or by humans is hierarchy. The hierarchy plays a crucial role in defining the components of a complex and gives them identity (Fig. 5).
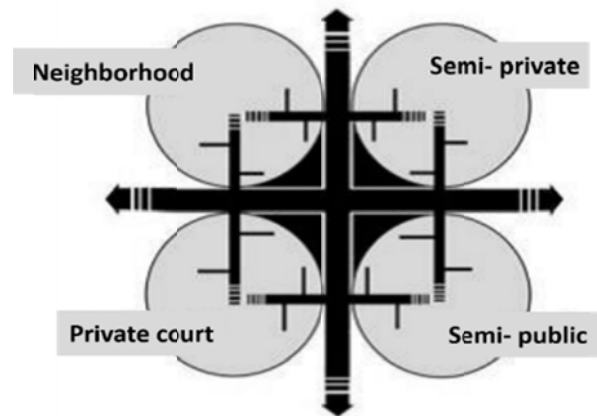

Fig. 5: Privacy hierarchical order in urban areas

Because of the victory of the Islamic ideology private and semi-private spaces of people's privacy, in Islamic Iranian cities is very important. Indeed, privacy is a personal right and induces concepts like space, privacy, territory and spheres of influence. In optimal conditions, networks of privacy hierarchy include urban space. Moreover Existence of the hierarchy of neighborhood public spaces and

residential private spaces show the impression to strangers that they enter somewhere in the realm of particular individuals who may be under the

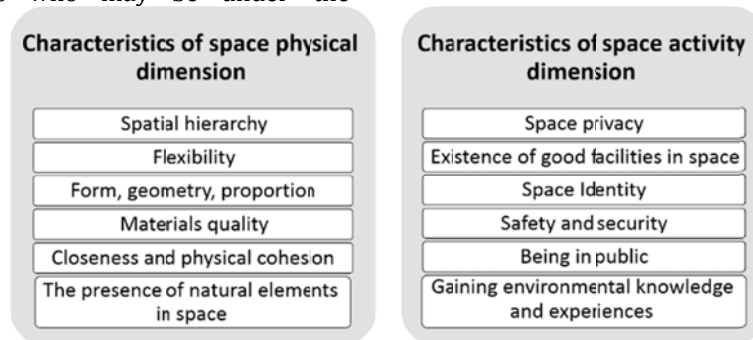supervision of its residents and makes the complex secure (Fig. 6).

Characteristics of space physical dimension	Characteristics of space activity dimension
Spatial hierarchy	Space privacy
Flexibility	Existence of good facilities in space
Form, geometry, proportion	Space Identity
Materials quality	Safety and security
Closeness and physical cohesion	Being in public
The presence of natural elements in space	Gaining environmental knowledge and experiences

Fig. 6: Characteristics of physical and activity space of dimension

Among these features, factors like providing territory, readability referred to the physical dimension and factors like the acquisition of knowledge and environmental experience, presence and social interactions referred to the space activity dimension.

2.4. Physical characteristics

Physical qualities of a public open space are in relation with the availability, location, physiological comfort in different conditions of climate and security. In addition to natural elements in public spaces that increase the excitement and vitality of the environment and inviting pedestrian to these areas and to allow rest for the people and create pleasant experiences are also important in this regard. Elements such as monuments, stairs, fountains and other factors in encouraging people to participate and interact in space are among the factors affecting the promotion of physical aspects of the public spaces. Designing qualities such as integrity of the space, dimensions, proportions, flexibility, form, geometry, materials, closeness, Bodies, spatial and physical coherence can affect the perception of space as a whole and thus the desired effect on human perception.

2.5. Activity characteristics

Functional characteristics of public spaces can influence on quality and quantity of attracting people to stop and interact in these spaces. Existence of enough places to sit and the occurrence of certain events in space, such as street performances, public art and events like this that people associate with each other, will add to the attractiveness of these spaces.

Studies show that public spaces in which people are able to work in the environment by looking at each other, sitting, dining, retail activities, sports activities and do cozy events, are more attractive for people. These activities and many other activity and physical characteristics in public spaces give dignity and provide comfort and let people to enjoy the affected space. In addition, areas are successful in social interaction that support dynamic interaction,

education environment, the free exchange of information and training in the form of display, environmental experience, enabling creative expression of individuals and groups that as a result this leads to an increased sense of satisfaction in social cohesion.

3. Case studies

The second Ekbatan phase covers an area of 498,684 m² and occupancy level of 35%, including 19 residential blocks, 3 markets and 4 schools. With regard to the purchase price and rental units Residents include the middle classes, upper-middle and upper classes. In a survey carried out in different phases of this complex (holiday and non-holiday) it was observed that many of residents appear for activities such as sports, walking, shopping, playing, and chatting in these spaces. The presence of residents in public areas of the complex, especially in the daily leisure time (out of business hours) and weekend give vitality to these spaces.

According to observations and public spaces and its physical structure (spaces and various applications, etc.), the default in choosing this complex is an environment with relatively good ability to attract people to public spaces (Table 3).

Character and local identity is the important factor to creating a sense of belonging place. A place is not just geographic characteristics, Place represents a spatial range of identity that has been distinguishing it from other places (Hubbard et al., 2008).

4. Conclusion

According to studies, the organization and layout of open and semi-open spaces in urban micro and macro scale is one of the most important principles in the planning and design of residential buildings. This principle in Iran's traditional architecture is based on association with human and his interaction with the environment. Unfortunately, in today's architecture because of quick entry of towers and residential complexes based on existing requirements and lack of opportunity and enough time to think about the principles of traditional

architecture, areas of open and semi-open spaces compared to residential spaces has been reduced so that residential areas would meet people's need, unaware of the basic human needs for social interaction and open and semi open spaces.

The aim of study is to identify effective role with regard to the features and characteristics of these spaces so that we emphasis on importance and necessity of open and semi-open spaces and to be considered in future design.

Table 3: The effect of physical environmental factors to creating a sense of place in Ekbatan residential complex

Physical environmental factors	
-Horizontal movement of the façade -Physical continuity -Spaces with diverse uses (market, park, pedestrains, green lands, ...) -Ability to perform various activities (exercise, play, conversation, walking, ...) -Vibrant spaces -Optimal building density	

4.1. Matching characteristics of open and semi-open spaces in increase of social interaction

The social dimension of public spaces is based on a triangle that includes human, space and collective life that respond to social interaction based on understanding the characteristics and needs of each one of them. In the first stage of this study human and his needs for collective living were examined and then open and semi-open spaces are defined and derived features that can influence increase in social interaction. Finally, the impact and the role of these characteristics are the results that were the purpose of this article (Fig. 7).
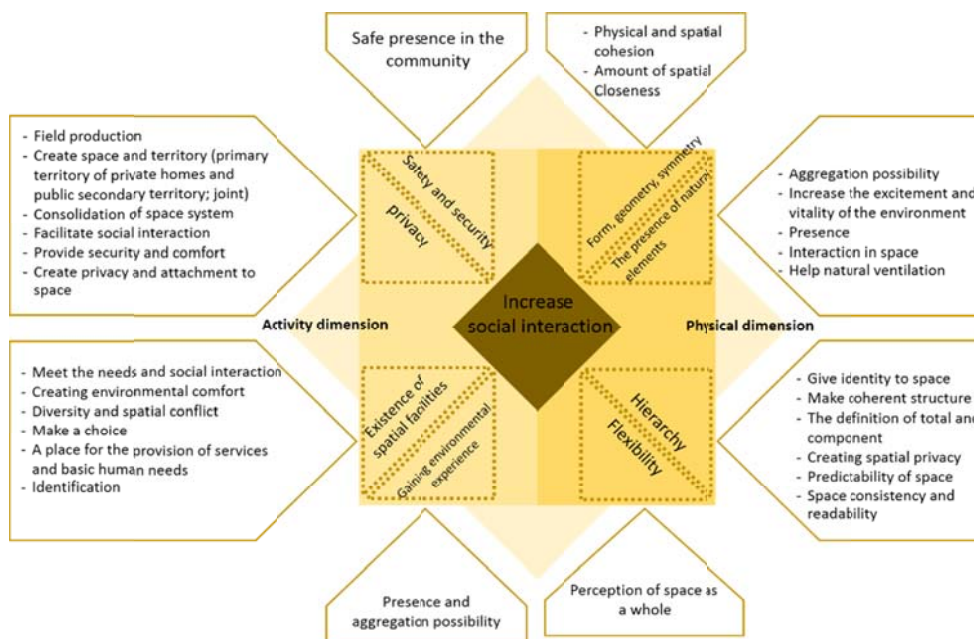

Fig. 7: Matching characteristics of open and semi-open spaces in increase of social interaction

4.2. Architectural design solutions for the presence of open and semi-open spaces

Communal spaces of a high-rise residential complex can become areas for interaction and

exchange of views of residents, if they have the right design. These spaces can be considered as the continuation of spaces and private lives, which are vital in a residential complex. In this section architectural design solutions have been proposed to strengthen the presence of open and semi-open spaces:

- Operation of physical opportunities for sitting, pause for reflection in space
- Production of focal areas for gatherings of people such as bus stations, places to eat and …
- Development of specific applications to the public such as restaurants, coffee shops and …
- Define inviting entrances and access to space visually and physically
- Prediction of functional elements and its aesthetic aspects
- Strengthening the readability and clarity of space in design of roads and space communications to guide people into space
- Access control of vehicles and importance of pedestrians
- Define the bodies and the identity of walls
- Communication with the urban transport system
- Prediction of exciting activities.

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