ISSN 2729-7640

sciendo

ALFA ARCHITECTURE PAPERS
OF THE FACULTY OF ARCHITECTURE AND DESIGN STU
www.alfa.stuba.sk

1/2023 (Vol. 28)
DOI: 10.2478/alfa-2023-0002

Investigating privacy principles' formation in vernacular architecture of arid and semi-arid parts of Iran

Aida Shayegani[1]

Viera Joklová[2]*

[1,2] *Slovak University of Technology, Faculty of Architecture and Design, Institute of Urban Design and Planning, Bratislava, Slovakia*

***Corresponding author**
E-mail: viera.joklova@stuba.sk

Article information
Sent: Oct 19, 2022
Accepted: Mar 12, 2023

Abstract:

Traditional Iranian architecture principles have deep roots in this region's culture, thoughts, and climatic conditions. Privacy, as one of these principles, which has ever regulated all aspects of life, has been beautifully embodied in the vernacular residential architecture of Iran. It proved to have profound effects which resulted in a specific spatial organization of the house and the placement of various functions, either private or semi-private. Many research studies have claimed that privacy was an attribute of Islamic rules in Iranian architecture. Based on historical and phenomenological analyses of vernacular Iranian architecture this paper strives to confront the privacy principle also according to Iranian (or former Persian) culture, climate, and security conditions. Changed geopolitical and cultural conditions in the 20th century raised new forms of architectural residential morphology almost completely negating the principle of privacy. The question is whether the vernacular principle of privacy should be embodied in the new design of Iranian residential houses or be preserved merely as an expression of former culture increasing the quality of the image of the city and its attractiveness. The research completed by qualitative morphological and analytical methods clarifies the mentioned principles and identifies the definition of privacy, the factors affecting it, the roots of its formation, its influence on the physical-spatial organization of traditional residential architecture in Iran, and its continuation in modern residential architecture in Iran.

Keywords:

privacy, climatic architecture, Iran, Islamic rules, vernacular residential architecture

INTRODUCTION

Throughout the history of humankind, vernacular residential architecture has been constructed with regard to security issues and local sources; its shapes and dispositions have been strongly determined by the utilization of local building materials, the climate, and by the social and cultural conditions. *"Vernacular architecture is a good example of intuitive building effectiveness"* so as many variables – climate, materials, living styles, are effectively integrated in the architectural morphology (Joklová, Bacová, 2013). Weather in the major part of the Iranian central plateau is hot and arid (Fig. 1), and many historic cities with valuable architectural designs are located in this hot and arid region (Keshtkaran, 2011). Residential structures in these conditions were characterized by narrow streets and dwelling units turned inward. Narrow streets provided shade from the scorching sun as well as greater protection from the expanding desert and enemy raids. From the 7th century onwards, Iranian architecture was vastly influenced by the principles of Islamic rules, which shaped buildings and the cities' architecture. Besides, Iranian hot and cold climatic regions require a significant amount of energy for heating, cooling, and ventilation. However, with the same climatic conditions in the past, multiple effective strategies have been used in vernacular residences to confront harsh circumstances (Khalili, Amindeldar, 2014). Generally, structures in this region have been logically affected by nature and culture. As a result, unlike many modern facilities, the traditional buildings in Iran are compatible with and have a harmonious relationship with the natural and cultural conditions (Keshtkaran, 2011).

Even in the pre-Islam era, Iranian architecture has paid particular attention to preserving privacy in buildings, this can be perceived in ancient Persepolis city structures or the Apadana principle. This phenomenon, in turn, has led many researchers to consider cultural-religious approaches and climate issues in their design process (Mahdavinejad, 2004). Therefore, traditional architecture can be viewed as a treasure full of concepts and human methods that have worked to pay attention to the security and comfort of the users of the building (Mahdavinejad, 2002). In general, *"buildings built by human hands are manifestations of his attitude towards the universe, which is based on the intellectual and social-cultural structure of the people of that society"* (Emami, 2011). One of the essential principles that have been paid attention to in the traditional architecture of Iran is the principle of privacy, which is best used in all buildings, from vast and large public buildings to residential houses, and from urban public

spaces to semi-public spaces, which have been used more privately (Seyfian, Mahmudi, 2007). *"The architecture of the past relied on the dignity of man, honouring the position of a man who was the caliph of God on earth"* (Hujjat, 2008).

Indigenous housing in Iranian hot and dry climate has constantly provided thermal comfort for its residents, followed by the coordination of the construction principles according to climatic conditions, environmental mitigation, and energy-saving solutions. The microclimate of the area in which the building is constructed affects the indoor climate of a closed or architectural space. Climate and environmental conditions are critical parameters in a building design. Buildings are designed to achieve or create a suitable atmosphere for human comfort (Givoni, 1976). They provide essential protection against the outdoor climate. Furthermore, they create an artificial indoor environment based on the surrounding microclimate. Architectural elements forming the thermal envelope, such as walls, windows, roofs, and floors, separate the microclimate and indoor climate and thus influence the indoor climate significantly (Nasrollahi, 2009).

The desire for privacy is a general requirement but relates to variables such as culture, age, gender, personality, and situated factors (Hall, 1966; Altman, Chemers, 1980). This article explores how different conditions affect privacy formation, especially in residential design. It is vital to recognize what privacy is and how it can affect the architecture, especially the layout of the plans, and placement of windows and doors. The research aims to survey the principle of privacy, its historical and phenomenological aspects and the manifestation in the vernacular residential architecture in Iran. The study defines the influence of cultural and religious backgrounds as well as climatic conditions on Iranian architectural style. It raises the questions about the sustainability of this principle in modern architectural design in Iran.

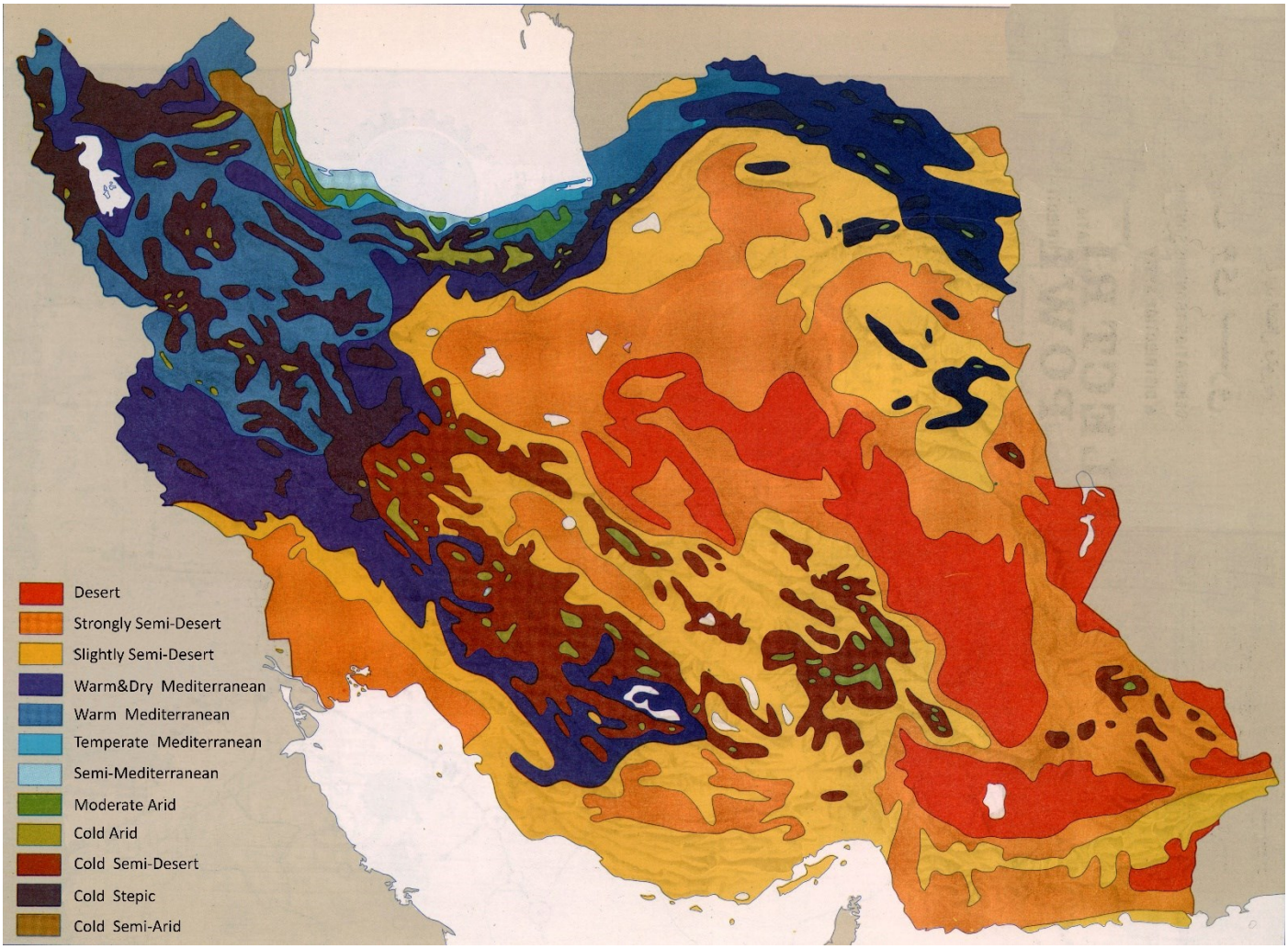


Fig. 1. Bioclimatic map of Iran. (Source: Muassasah i Jughrafiay i va Kartugrafi i Sahab, 1972; modified by authors)

BACKGROUND

In general, we can state that privacy is the right to be let alone. It is one of the main principles of residential architecture and one of the essential rights of the individual. The layout of the apartment or house has to offer spaces for the separation and socialization of an individual, family member or community. *"Privacy is a conventional process by that a person or group of people exposes themselves to others"* (Niay Gharaei, Rafieian, Jalalkamali, 2012).

Altman (1975) defines it as a process to justify the borders among people by a person who supervises their relationship. According to Altman, privacy is a dialectic process built on two powers: "being with others" and "avoiding being with others." According to Gifford's (2002) definition, *"privacy means selective control of access to self, either in person or in terms of information about oneself"* (Niay Gharaei, Rafieian, Jalalkamali, 2012). It can be considered a preference, expectation, value, need, or behaviour. Differences in privacy behaviour originate in personal char-

acteristics, social situations, physical settings, and culture. *"Some people, because of their culture, personality, or other characteristics, require more privacy or express privacy needs differently from others. Certain social situations or physical settings, regardless of who is in them, engender different privacy needs"* (Gifford, 2002; Altman, 1975; Hall, 1959). In other words, the person or the group chooses mechanisms based on the basis of age, gender, personality, cultural–social background, and situated factors to achieve desired privacy (Altman, Chemers, 1980; Lang, 1987; Niay Gharaei, Rafieian, Jalalkamali, 2012).

Cultural influences on privacy

The desire for privacy varies from one culture to another. Some cultures need more privacy than others (Altman, Chemers, 1980). According to this fact, Hall (1966) classified cultures into two different classes: contact and non-contact. Based on his studies, the spatial behaviour of Mediterranean and northern European people is significantly distinguishable; Mediterranean societies prefer relatively interactive distances, while north European institutions prefer greater interactive lengths. Hall's studies became the basis of subsequent research on the cultural effects on unique behaviour and the personal space of the citizenry. Researchers, working based on Hall's classification, indicating Mediterranean (contact groups) and northern European (non-contact groups) characteristics, supported his results and ideas through surveys they had undertaken (Watson, Graves 1966; Forston, Larson,1968; Little, Henderson, 1968; Sommer, 1968; Engebretson, Fullmer, 1970; Evans, Howard, 1973; Hayduk, 1994; Sanders, Hakky, Brizzolara; 1985; Remland, Jones, Brinkman, 1995). Consistent with these studies, we can assume that the inhabitants of the northern parts of Iran, where the climate is mild and humid, and the dwellers of central parts of Iran, where the weather is harsher and dryer, would differ in their privacy regulations. According to the participants' cultural background, the people who lived in the central parts of Iran with arid and semi-arid climate conditions would have higher privacy needs in their daily lives than the northern dwellers of Iran (Niay Gharaei, Rafieian, Jalalkamali, 2012).

Privacy in Iranian traditional housing architecture

The meaning of privacy in architectural space and urban planning is to embody the space in such a way that it has privacy from both physical and semantic aspects. Privacy in Iranian architecture comprises security and respect for others' rights (Seyfian, Mahmudi, 2007). Having privacy in the area of the space is more focused on the principles that shape the security of the space and in the semantic area that brings dignity and value to the architectural space in such a way that a person can relax in it (Mahdovinejad, Mashayikhi, 2010). According to the title, a space that physically has privacy, immunity, and security for the user can be considered confidential. Its spatial qualities are such that it provides peace and comfort to the person. It is clear that visual security in this space is only part of its features, and the concept of comfort and relaxation includes a much larger scope. When a person chooses a person as their confidant, they consider the latter trustworthy, secretive, and an insider (Besim Selim, 2002). Therefore, we can state that privacy creates intimacy. The spatial configuration of a traditional residential house in Iran consists of public, semi-public, and private spaces – layers. Semi-public layers are further divided into men's and women's social layers (Fig. 2).

A simple application of two different types of knockers on the entrance door allowed the house's residents to recognize whether the visitor was male or female. *"The slot with low pitched sound was for men, and the one with high pitched sound was for women. This difference helped the house members and the one who opened the door know the gender of the guests from the sound of the slot and be prepared to see them"* (Nayyeri Fallah, Khalili, Rasdi, 2014).

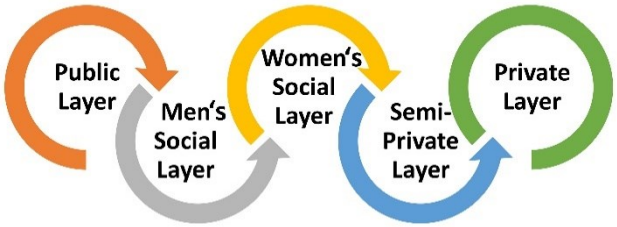


Fig. 2. Scheme of the spatial configuration of a traditional residential house in Iran. (Source: Authors)

The public layer as a boundary space with the public space of the street shows the spatial system of privacy from outside to inside the house. The public space of the house does not allow a view into the internal semi-public or private spaces. Thus the privacy of the dwellers is not disturbed. The Iranian house cannot be seen at once; the spaces organized in these houses are not visible in one picture. One should enter the house, move inside it, and access its various areas (Haeri Mazandarani, 2008) (Fig. 3).

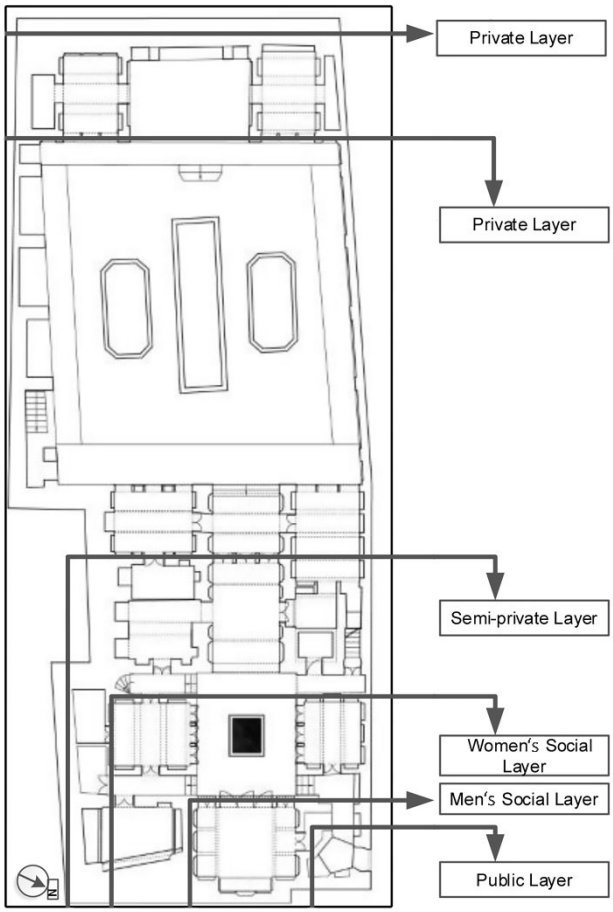


Fig. 3. Interpreted privacy layers within traditional Iranian housing. Boroujerdi House, Kashan, Iran. (Source: Nayyeri Fallah, Khalili, Rasdi, 2014)

The following analyses show the principle of privacy application in traditional Iranian houses; it is necessary to mention that these

are originally the houses of middle-class Iranians. *"The entrance space is a place to stay, wait and converse. In some cases, there are some platforms at the sides for sitting, which are used to welcome or companion the guests. In this regard, the entrance was built so that people would not directly and immediately enter the building. Thus, after entering the vestibule, they would enter a corridor placed on the sides of the vestibule and then enter the yard and other internal spaces of the building"* (Nayyeri Fallah, Khalili, Tajjuddin, Rasdi, 2015) (Fig. 4). The second house privacy layer is a men's social layer located after the public area. This part is mainly for men's social communication. As such, based on observation and plan layout analysis, the corridor which connects the entrance to this space does not enable the view into the inside of the house. This part of the house usually includes two spaces for the prominent guests and their servants (this area's name is Gholam Gozar in Iranian architectural elements). This way, the hierarchy principle based on social differences is strengthened (Nayyeri Fallah, Khalili, Rasdi, 2014).

The men's social layer is followed by the women's social layer around the house's outdoor yard. This layer of the house has a few sight limitations because of the users' gender. Outdoor service spaces like an outdoor kitchen, sanitary areas, and food storage are inaccessible to men and women coming to the house's social layers. Iranian culture has tried to make desirable social parts of the house for guests to show the importance of guests for Iranians and their hospitality rooted within them through the linkage of architecture and nature. Based on analyzing the data collected from experts' we can consider the next layer a semi-private zone of the house, which includes a guest bedroom and men's workroom. This part of the house is a border between women's social and private layers (Nayyeri Fallah, Khalili, Amp; Rasdi, 2014). Thus, this border must be crossed to reach the house's personal layer. A traditional Iranian housing space then continues with private layers (the innermost and completely confidential). Based on existing research, these layers are entirely for family life, and strangers' entering without permission into these areas is forbidden. According to the plan layout analysis of the selected traditional case studies, the private layer involves three levels (first floor, ground-, and underground floor) connected by private stairs (Nayyeri Fallah, Khalili, Rasdi, 2014) (Fig. 5). These parts of the house are not only the most distant from the outside, but through using water, flowers, and trees in the inner courtyard, they represent symbolic heaven for the family part and help a family to enjoy a more desirable environment and climate (Nayyeri Fallah, Khalili, Rasdi, 2014).

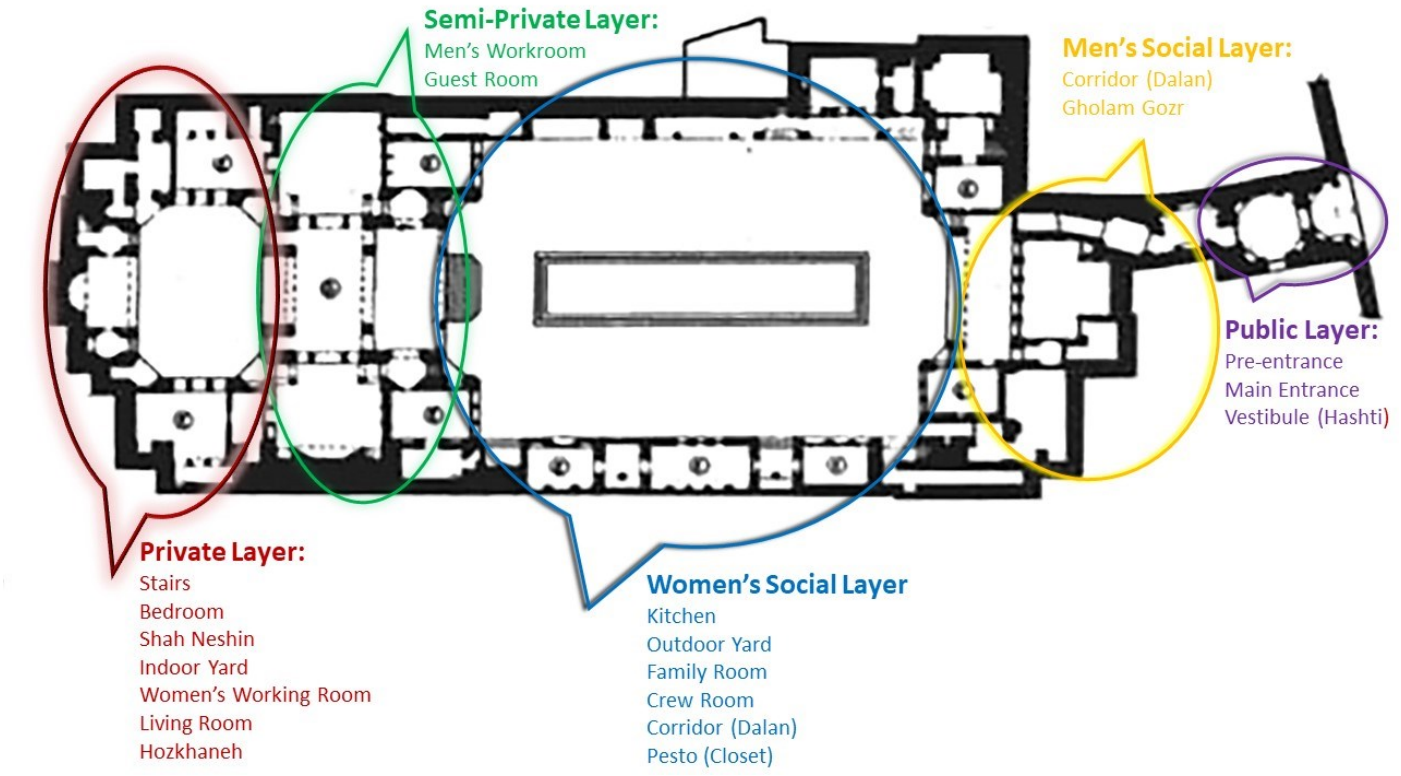


Fig. 4. Analyzing the houses' ground floor layers according to privacy. Borujerdi House, Kashan, Iran. (Source: Authors)

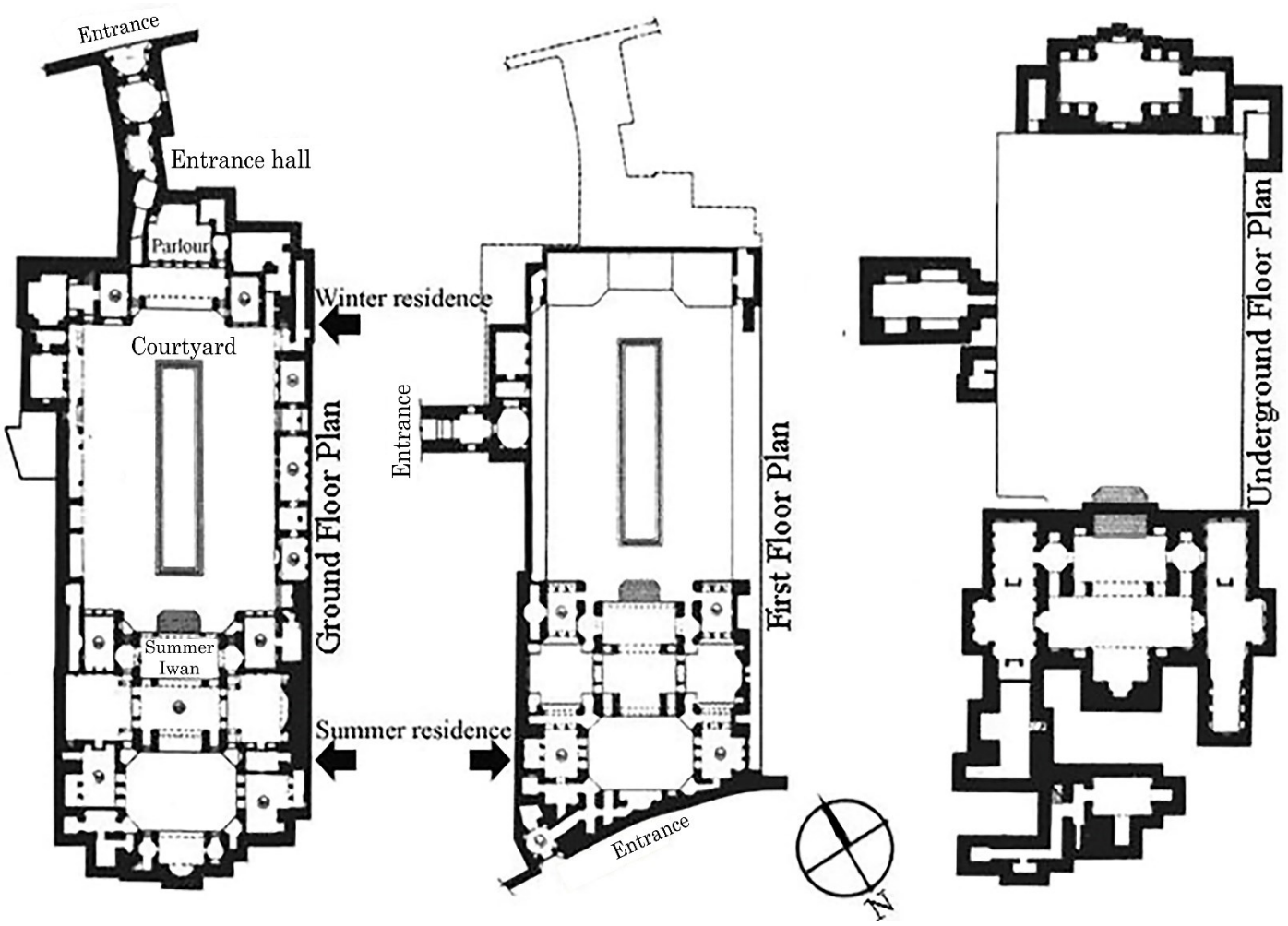


Fig. 5. Borujerdi House, the ground floor, first floor, and underground floor layouts, Kashan, Iran. (Source: Nosratpour, 2012)

MATERIALS, DATA AND METHODS

This research aims to identify the cultural values of traditional Iranian housing in terms of privacy features. The data is a comparison of literary sources and is illustrated through a mixed historical and qualitative research method, document studies, and observation. Based on historical and phenomenological analyses of Iranian vernacular architecture, this paper furthermore strives to confront the privacy principle according to Iranian (or former Persian) culture, climate, and security conditions. Changed geopolitical and cultural conditions in the 20th century helped raise new forms of architectural residential morphology, almost completely negating the principle of privacy. The question is whether the vernacular principle of privacy should be embodied in the new design of Iranian residential houses or just be preserved as an expression of previous cultures and thus increasing the quality of the image of the city and its attractiveness. The research completed by the qualitative morphological and analytical methods seeks to clarify the mentioned principles to identify the definition of privacy, the factors affecting it, the roots of its formation, its influence on the physical-spatial organization of traditional residential architecture in Iran, and its continuation in modern residential architecture in Iran.

Main privacy principles in Iranian housing formation

A. Introversion principle

Phenomenological analysis vindicated this principle as a concept that has existed in Iranian architecture as a specific value. It is morphologically visible and understandable in different forms that have deep roots in Iranian cultural attitudes. It was strengthened after the new philosophy of Islam and its formation of privacy (Omer, 2010). Regardless, it should be mentioned that the principle of introversion has also been applied in ancient architecture and has survived in residential architecture all over the world to the present days. In the spatial configuration, it is manifested by a central courtyard to which the spaces of family life are oriented (Nayyeri Fallah, Khalili, Rasdi, 2014) (Fig. 6).

Fig. 6. The morphology of a central courtyard, Borujerdi House, Kashan, Iran. Interpretation of introverted architecture. (Source: Hosseini, Nik Eteghad, Uson, Armesto, 2015)

B. Hierarchy principle

Hierarchy (from Greek: hierarkhia) is a way of organizing a system in which every element, except for the highest one, is subordinate to a single superior element. The principle of hierarchy causes the formation of spatial territories with a different function, meaning and importance, and morphology within spatial boundaries. The hierarchy in architecture is most often established through the use of unique shape, size, colour, strategic location, or placement, which define the importance of the specific space (Shah, 2017). It is essential to apply the principle of hierarchy in spatial urban and architectural systems and distinguish public spaces from private ones (Nayyeri Fallah, Khalili, Rasdi, 2014) (Fig. 7). In this regard, when the elements of a building are divided into different parts with distinguishable frameworks and processes, transferring from one territory to another immediately and without preparing the necessary conditions is undesirable (Ardalan, Bakhtiar, 2000). Privacy limitations are the distance between the most private solitude of the resident in the house and the most public gathering of residents and relatives in the house in the form of intermediate and consecutive spaces. This criterion shapes the spatial hierarchy of the house (Haeri Mazandarani, 2008). We can observe that Iranian traditional architecture has been significantly influenced by *"the Design Value of Hierarchy as one of the main principles in the world"* (Seyfian, Mahmudi, 2007). Furthermore, *"any universe object in the Islamic worldview has a particular place and status whose value and the characteristics of its hierarchy determine the status"* (Naghizadeh, 2000).

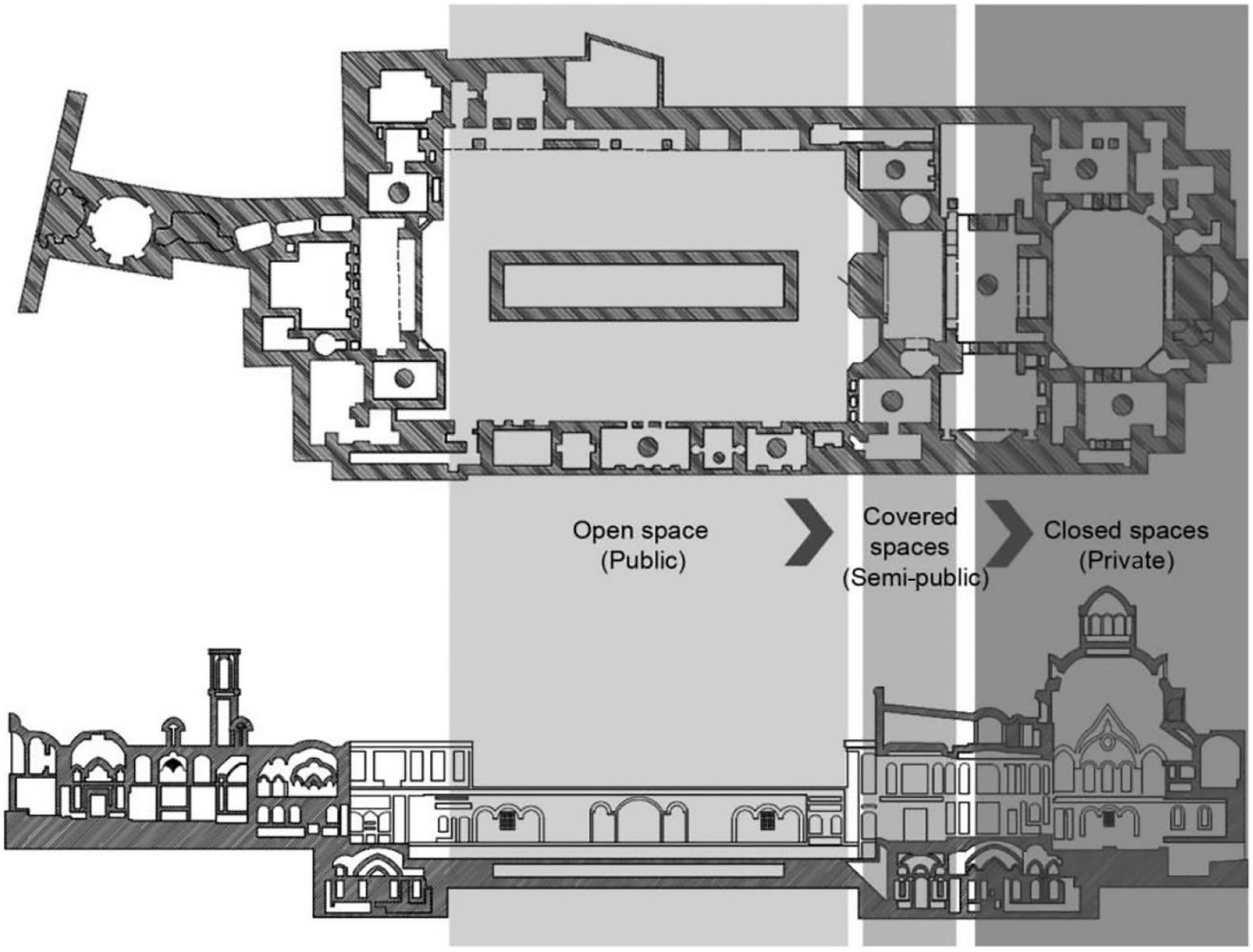


Fig. 7. Interpretation of hierarchical system of privacy in plan and section of Borujerdi house, Kashan, Iran. (Source: Eskandari, 2011, modified by authors)

Formation of privacy factors in Iranian historical houses

Based on the morphological survey of traditional Iranian residential architecture, we can consider two main elements affecting privacy in Iranian vernacular architecture as indicated below: (i) Privacy principles according to culture and religion, (ii) Privacy principles according to climatic conditions. Another point worth mentioning is the issue of security and freedom in the home environment. A person in their private territory achieves a kind of freedom and a sense of security. Vernacular Iranian architecture carries traces of protection against numerous invasions, as well as protection against the expansion of the desert. The houses possess an innate system of protection. They all have enclosed gardens with maximum privacy, preventing any view into the home from the outside world (Fig. 8).

Privacy principles according to Islamic rules

The culture, religion, and art in Iran mixed with new factors after the rise of Islam. The Islamization of Iran occurred due to the Muslim conquest of Persia in 633–654 AD. Traditional Iranian housing has been merged with religious rituals, principles,

the spirit of thinking, traditions, characteristics, and the attitude of generations. Privacy, as an Islamic principle governing all aspects of life, has formed traditional Iranian housing and has had profound impacts on and outcomes in its spatial organization and function. In this regard, looking at the related verses of the Quran, the features of privacy from the Islamic perspective are understood as the most vital source of learning the principles which explain different behaviours according to respecting other people's privacy. According to Besim Selim (2002), Islamic principles state some points on how to enter a house and ask for permission. Furthermore, they rule the intimate behavioural and verbal manners of people living together in the same house, and thus manage approaches to consider the design of the spaces and house morphology (Nayyeri Fallah, Khalili, Rasdi, 2014). The religion of Islam has clear instructions in this regard as well, and many holy principles have been narrated from Islam's prophet and his siblings, where even the most minor points are mentioned about how to knock on the door, how to get permission, and how to enter them. It is quite evident that the relevant Iranian Muslim architect has also tried the best way to embody these points.

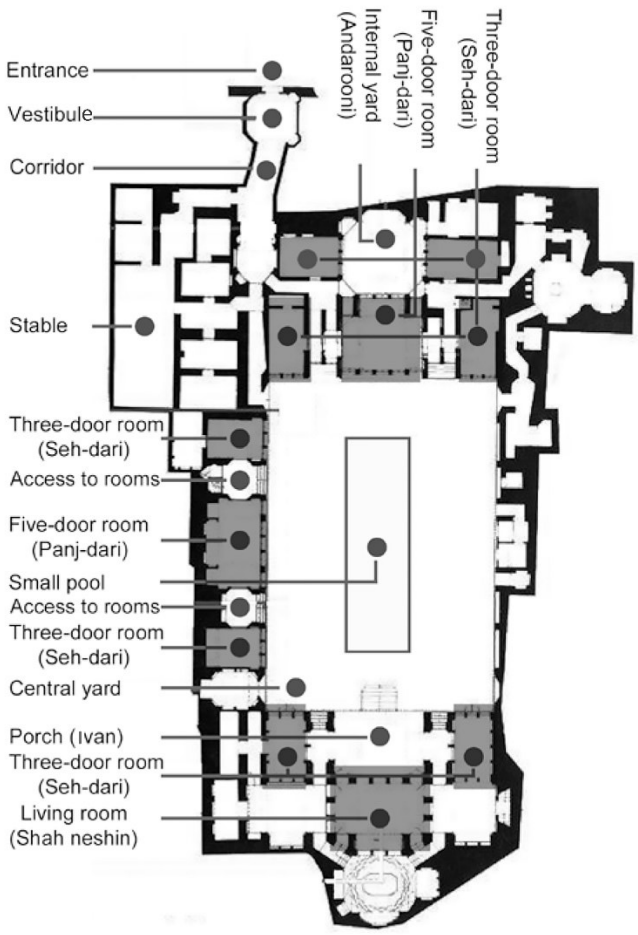


Fig. 8. Spatial arrangement in Sharifian House, Kashan, Iran. (Source: Eskandari, 2011, modified by authors)

Privacy principles according to climatic conditions

Iran lies in a warm climatic district between 25◦ and 40◦ latitude. The deserts of northern Africa and Saudi Arabia extend from the Atlantic Ocean in western Africa across Iran and end in Afghanistan and Turkmenistan (Keshtkaran, 2011). Iran has eight different kinds of climatic regions, as follows (Khalili, Amindeldar, 2014):

1. Regions with 'approximately hot summers' and 'nearly cold winters' accompanied by an incredible amount of humidity.

2. High mountainous regions with 'mild summers' and 'frigid winters'.

3. Nearly high mountainous regions, with 'approximately hot summers' and 'almost cold winters'.

4. Low mountainous regions, with warmer summers and winters, compared to the third group.

5. Regions primarily located in central Iran, with 'arid-hot summers' and 'cold winters'.

6. The borders of the Central Desert (Dasht-e Kavir) with extreme hot-arid summers and 'nearly cold winters'. In these areas, achieving human comfort, especially in the hot season, could be very difficult.

7. Regions with very hot and semi-dry summers and moderate winters.

8. Coastlines and islands of the Persian Gulf and Oman Sea, which are very hot and humid in summer and moderate in winter. In this climatic area, hot and humid weather condition makes it challenging to achieve thermal human comfort (Haghparast, Niroumand, 2007).

Two regions from groups 5 and 6 were selected for this study. The air temperature in these regions ranges between 40–45°C and a minimum of 0–5 °C. Total precipitation is meagre, relative humidity is under 30%, with a clear sky during the summer days. In addition, the dusty wind is an essential factor in these unstable regions (Khalili, Amindeldar, 2014).

Climatic issues have always posed serious problems for residents of these regions. Over thousands of years, people were driven to find astonishing solutions to reduce the disturbing aspects of the climate and make use of its convenient aspects, in passive design approaches for dry and hot regions. Such efforts engendered constructional patterns which interact with the nature rather than conflict with it, bringing the benefit of minimized amount of artificial lighting and required cooling. Hence, constructional patterns taking advantage of climatic elements and the environment to produce traditional architecture providing quality and comfort, play a significant role in eliminating the need of high energy consumption. (Khalili, Amindeldar, 2014)

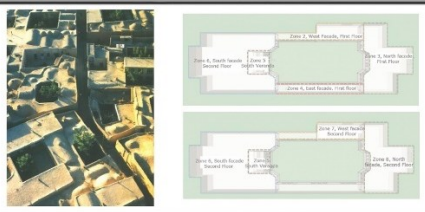
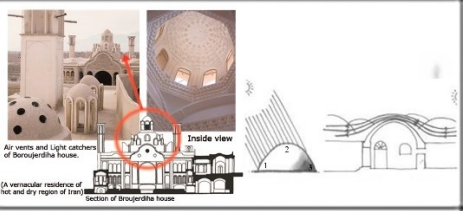
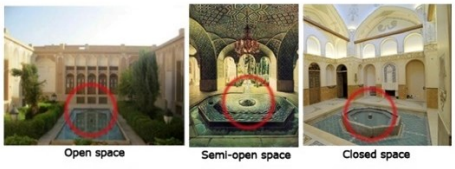
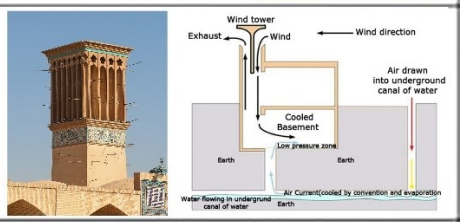
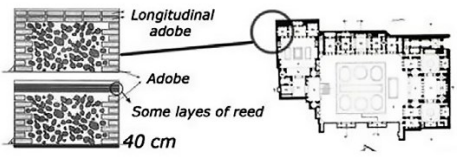
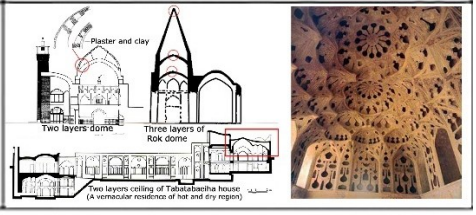
We can observe brilliant morphological solutions developed in such difficult climatic conditions to provide thermal comfort in Iranian vernacular architecture. Building orientation, methods of communication with the ground and underground, introversion and closure, wall thickness, the height of rooms, and applied materials confirm the maturity of the traditional builder's respect to and semiotics with the environment (Khalili, Amindeldar, 2014). Some research studies have proved that spatial proportions, the dimensions of the main structures, and even construction details are based on very precise methods and calculations (Afshar-Naderi, 2003). The most important of them providing residential comfort conditions are:

- Enclosed yard;
- Vaults, domes, and air vents;
- Using water and vegetation;
- Semi-open spaces (veranda or Ivan);
- Wind tower (Badgir);
- Wall thickness, height, and material;

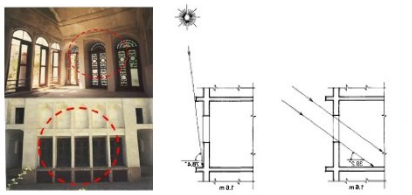
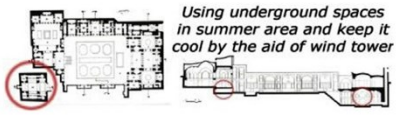
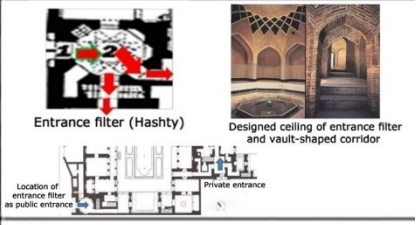
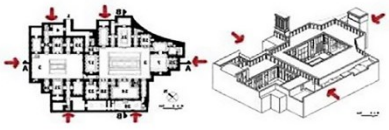
- Multiple-layer ceiling;
- Openings;
- Using underground spaces for cooling;
- Using natural light to the greatest extent;
- Using service areas as temperature filters;
- Using entrance filter.

Tab. 1, 2, and Fig. 9 show the variable strategies of climatic approaches in Iranian vernacular architecture in the mentioned parts of Iran. As evident, the strategies used in plan design and supported climatic architectural approaches act in harmony with introversion and hierarchy in reaching the house's private zone and separating it from the public area.

Tab. 1. Summary of 7 climatic strategies: summary of climatic approaches in Iranian vernacular residential architecture that were used in hot and dry regions. (Source: Saljoughinejad, Rashidi Sharifabad, 2015, modified by authors)

	Climatic strategies	Abstract	Diagrams and details
1	Enclosed yard	A central yard, which protected the micro-climate of the yard against the harsh macro-climate of the hot and dry climate outside.	
2	Vaults, domes and air vents	Arched shape of roofs, using adobe and mud. Since they were constantly exposed to the flow of air caused by the wind, it was a useful way to reduce the heat of the roof. They were also combined with air vents.	
3	Using water and vegetation	To humidify and reduce the environmental heat, allowing evaporation and more cooling to the airflows coming through wind towers, air vents and light catchers.	
4	Semi-open spaces	To create more shadow to protect users from direct sun, using high walls and narrow alleys covered by vaults and enclosed spaces.	
5	Wind tower	A tower which made the cool summer breezes drawn into them and penetrate into the buildings, where cooling could be achieved by cross ventilation.	
6	Walls thickness, height, and material	Providing thick walls and roofs, which delay the heat flow within the thermal mass in order to diminish its effect on the indoor environment.	
7	Multiple layers ceiling	Ceilings that were made of multiple layers to minimize heat exchange between inside and the roof.	

Tab. 2. Summary of 7 climatic strategies: summary of climatic approaches in Iranian vernacular residential architecture that were used in hot and dry regions. (Source: Saljoughinejad, Rashidi Sharifabad, 2015, modified by authors)

Climatic strategies		Abstract	Diagrams and details
8	Openings	Openings, with their location, orientation, colour, material, size, and shading, influenced the inside environmental comfort and natural light.	
9	Using underground spaces	Considering the heat capacity of soil and the grounds' minimal temperature exchange which can cause thermal comfort for the residents, underground are perfect places to be utilized as living areas.	
10	Using natural light as possible	Openings, located on the walls and roofs were all considered in a way that all spaces including second-storey rooms and underground spaces received natural light.	
11	Using service areas as filters	Usually service areas were placed around the main living rooms, so they could be a temperature filter between outside and inside spaces.	
12	Entrance filter	An architectural octagonal space designed for the guests in front of the entrance which was utilized as thermal filter.	
13	Corridors	Corridors usually played a role of canal for air flows. The moving air speed gradually increased mainly because of the corridors shape and entered the enclosed yard.	
14	Introversion	The reasons such as getting rid of the dusty weather outside, creating a comfortable micro-climate through the enclosed yard, and cultural issues had made the residences form introverted.	

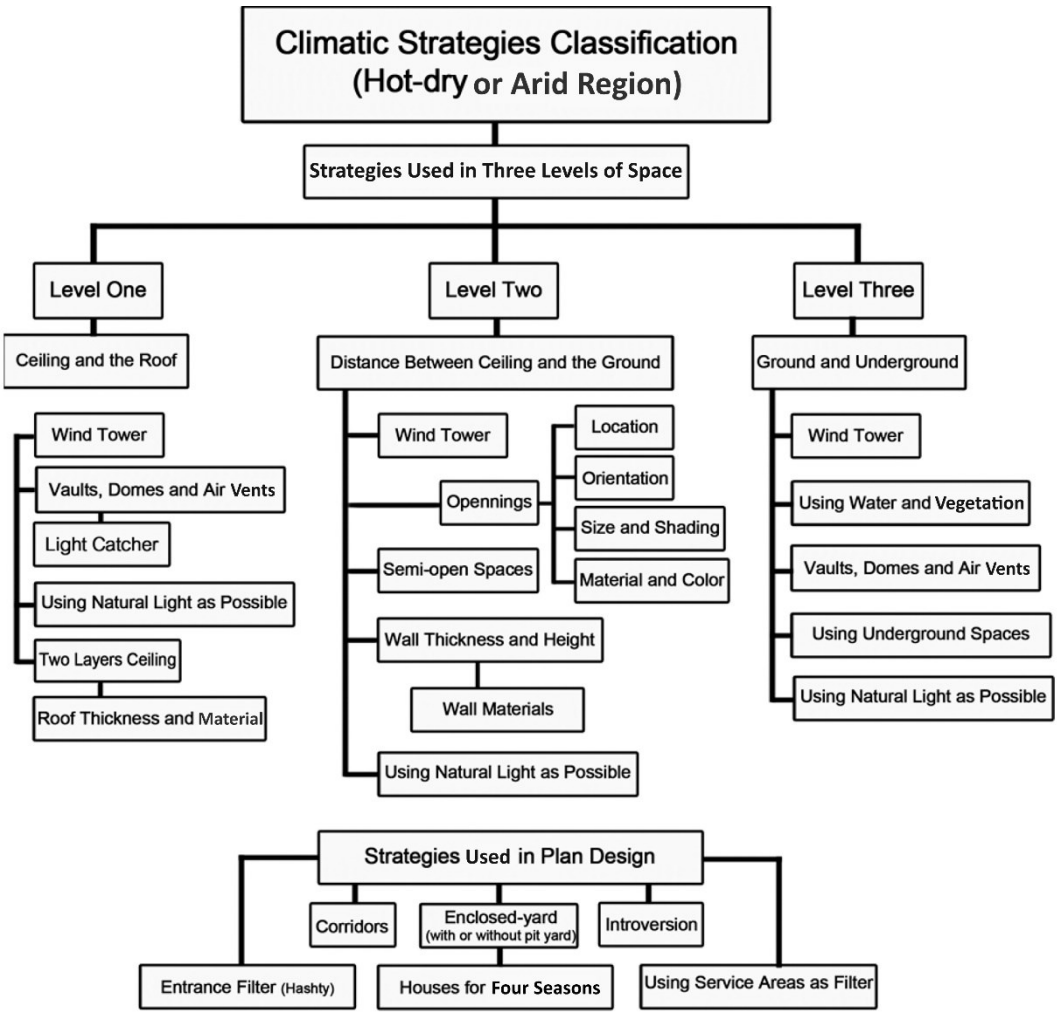


Fig. 9. Climatic strategies classification in the hot and dry region. (Source: Saljoughinejad, Rashidi Sharifabad, 2015)

BASIC MORPHOLOGICAL ELEMENTS OF IRANIAN HOUSE

Among the basic morphological elements of the public and social layers in the traditional Iranian house for middle class residents are:

Entrance and main door

The territory of an Iranian house starts at the outside of the house; the public gradually turns into privacy. Until reaching the inside of the house (courtyard), successive spaces of 'pause and passage' are created. A dedicated space is designed to enter the house, and the concept of privacy and public is reflected in this space; different paths are provided to enter each of these territories from within this space. The house's entrance uses architecture to fit the purpose and preserve relevant traditions. The entrance space is part of a sequence of interconnected and related areas of the whole house. When entering the building in front of the house, they are both an 'obstacle' to entering the non-public premises in house and a place to welcome semi-familiar guests. The greetings are exchanged here, and passers-by may sometimes take a short stop to relieve fatigue and use its shade. The entrance is still a bridge between the privacy of the house, the street, and the neighbourhood (Kateb, 2005) (Fig. 10).

Fig. 10. Gender differentiation by the type of door knockers in traditional Iranian houses. (Source: Raviz, Eteghad, Guardiola, Aira, 2015)

Vestibule

After passing through the entrance, upon entering the house, the visitor should stop in a space offering the possibility of pausing. The entrance sections are dimmed and cooler compared to the passage space. It has a welcoming and relaxing atmosphere; people can stay and talk if needed. The area usually comes in a square, rectangular, or octagonal shape. The door takes a different height. The vestibule is the first space of the Iranian houses that anyone enters; intended to help reduce fatigue and rest until we know which room to go to. There are one or more doors, one or more routes in or from the vestibule; one path goes to the upper house. This way is for those who will not enter the house and the courtyards. One track goes to the yard through the hallway (Haeri Mazandarani, 2008) (Fig. 11).

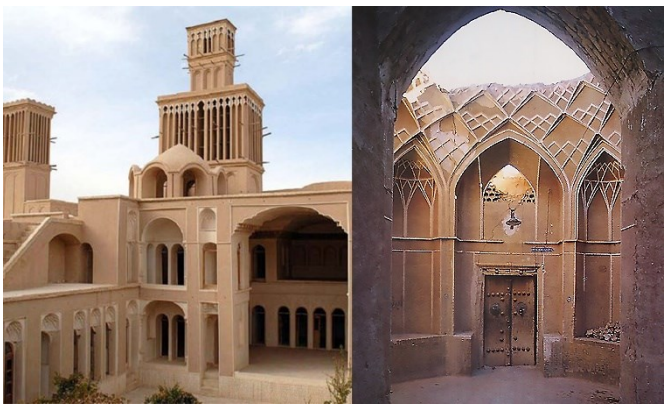


Fig. 11. Aghazadeh Historical House, Yazd, Iran. (Source: left – Hosseini, Nik Eteghad, Uson, Armesto, 2015, right – Reza Haeri, 2012)

Dalan (Corridor)

The hallway is the most straightforward part of the entrance space, which provides communication and access between two places; a corridor indirectly leads to the courtyard. Typically, corridors are physically narrow. Of course, their width is determined according to the function of the building and the number of users. The width of the corridors of mosques and large schools is, on average, between 2 and 3.5 meters, and the width of the corridors of tiny houses is, on average, about one meter (Mahdavinejad, Mansour Pour, Qeiderlou, 2013) (Fig. 12).

Fig. 12. Corridors of traditional houses in Iran. (Source: Authors)

Courtyard

After entering the vestibule, on the way to the corridor, follows the courtyard. The hallway that connects the vestibule to the courtyard is half-dark. The space gradually brightens. A courtyard is a space without a roof with specific bodies, the fronts of the courtyard are formed by the facades of buildings and covered areas, and in the parts where there is no building, the wall plays an active role in defining the courtyard. Almost all the routes, stairs, steps, rooms, and cellars are connected to it (Haeri Mazandarani, 2008). The yard composition in traditional houses is consistent with the variety of physical and spiritual needs. These needs also explain the relationship between the private and public sectors (Fig. 13).

Fig. 13. Ameriha Historical House, Kashan, Iran. (Source: Sarihi, 2015)

DISCUSSION

Identifying the influence of cultural, social, and climatic impacts clarifies the changes in Iranian historical architectural style. The analysis of them through key information instruments revealed that privacy is an inseparable principle in vernacular designing of residential buildings in arid and semi-arid parts of Iran. Furthermore, analyzing the effect of climatic approaches to bring along ventilation and passive cooling, which in turn could minimize the use of fossil energy in the historical architecture of Iran, shows the undeniable effect on the composition of privacy in designing plans. The mentioned approaches play a major role in the privacy shaping of traditional Iranian houses. Considering these two factors behind achieving privacy, the role of architectural elements in creating the required privacy effect in traditional Iranian houses is worth mentioning.

The physical environment of traditional Iranian housing played an important part in achieving desired privacy for settled families. It means that in this context, the ability of architecture is one of the most focal parameters to enhance the quality of residents' life. These parameters, like hierarchy and introversion, shape human values, which are under the cultural understandings of residents about housing and its quality in terms of privacy. Additionally, the research findings show that the spatial organization of the house is a complex mechanism to support residents' familiar life through very exact space differentiation, allowing people to have their personal and interpersonal territories. As a result, these territories created opportunities for residents to have better housing environments.

Based on the plan layout analysis and interpretation, the findings indicate that middle-class Iranian traditional house consists of six different layers in terms of privacy. These layers are public, men's social, women's social, semi-private, private, and personal private (Fig. 14). Such spatial organization is the solution to answer

residents' higher needs based on their cultural values. (Nayyeri Fallah, Khalili, Tajjuddin, Rasdi, 2015)

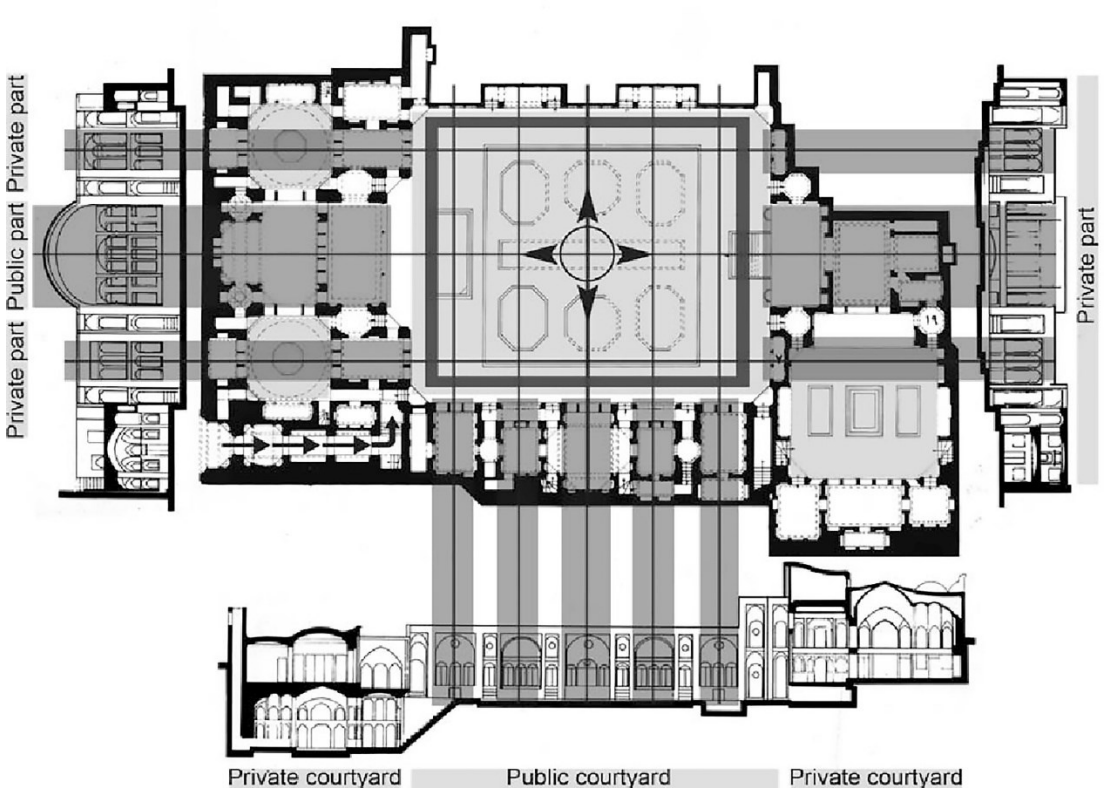


Fig. 14. Spatial organization and privacy hierarchy in Tabatabaei House – Kashan, Iran. (Source: Eskandari, 2011, modified by authors)

Among all the constituting features of privacy, religious or climatic, a specific architectural morphology can be observed, developed and blessed by both these compelling reasons. Changed geopolitical and cultural conditions in the 20th century raised new forms of architectural residential morphology, almost completely negating the principle of privacy. There are ongoing discussions (Masoud, 2020) whether the vernacular principle of privacy should be embodied in the new design of Iranian residential houses or just be preserved as an expression of ancient culture, and thus increasing the quality of the image of the city and its attractiveness. Many modern Iranian architects (Apcar, Forughi, Sadeq, Vartan...) promote modernist principles in their designs of residential architecture with the application of new materials, structures, and layouts; with the principle of privacy being significantly limited.

The contemporary residential architecture of Iran extensively adopts the features of global modern architecture without considering the roots of ancestors' deep creative attitudes. It experiences mass construction mainly because of the population explosion. Based on analyzed data, housing spaces consist of the pre-entrance area, entrance space, kitchen, living room, sanitary space and bathroom, and bedroom(s) (Fig. 15, 16). In most cases, there are no men's social layers. The residents of modern middle-class housing no longer have such a range of privacy like in the past. The modern housing layout reflects the social, cultural, and economic changes in the life of the inhabitants of Iranian cities and neglects traditional cultural values.

CONCLUSION

It can be stated that the climatic approaches and striving for sustainable design, together with cultural background, family lifestyle, the pattern of social relations, and behavioural criteria of Iranians, have been essential and practical principles for ensuring privacy in traditional Iranian homes. Based on many pieces of research, the origin of privacy principles in Iranian vernacular residential architecture was attributed to Islamic rules, but as we investigated in this paper, not only is privacy caused by religion but also by security reasons and climatic design measures. Though it is undeniable that after Islam, privacy rules have been considered more than before. However, changes in the way of life, social, and cultural spheres led to the need to reassess the sustainability of the privacy principle being strictly applied in residential architecture in Iran.

State policies that supported women's education and employment in the last century freed women from households and supported their aspirations for modern housing. We can observe that contemporary people desire to reveal, express, and expose themselves to others. It is as if people no longer have many things to hide that require high walls and fences in the house, and that they will only worry about the loss of property and material assets inside the house, and not about social relations, privacy, or human values. This is because a "global citizen" is born in one place, studies in another, and works in different lands. Therefore, the concept of home, paternal home, ancestral land, homeland, and pri-

vate home will no longer evoke that traditional concept in them. Due to the emergence of a kind of uniformity and homogenization in the culture of houses, "global citizens" will probably forget the native architectural cultures. At the same time, one should know and respect the local styles of architecture and house building. Knowing that the relationship between housing and culture will never be the same as in the past, a new logic and research should be established on how to preserve and evolve the native architectural culture in different regions of the country by creating a relationship of another kind.

Fig. 15: Analyzing the middle-class modern Iranian housing from the aspect of privacy, Shiraz, Iran, 2009. (Source: Authors)

Fig. 16: Analyzing the middle-class modern Iranian housing from the aspect of privacy, Tehran, Iran, 2014. (Source: Authors)

References

Afshar-Naderi, K. (2003) 'Iranian Architecture & Monuments, Iranian Architecture Today, A Bridge Between East and West', Iran Chamber Society. [online] Available at: https://www.iranchamber.com/architecture/articles/iranian_architecture_today2.php

Altman, I. (1975) 'The environment and social behavior', Brooks Cole, Monterey, California, USA.

Altman, I., Chemers, M. (1980) 'Culture and Environment', Cambridge university press, Cambridge, United Kingdom. ISBN 9780521319706

Ardalan, N., Bakhtiar, L. (2000) 'The Sense of Unity: The Sufi Tradition in Persian Architecture' (2nd ed), Kazi Publications, Chicago, USA, p. 150.

Besim Selim, H. (2002) 'Arabic-Islamic cities, principles of urban planning and construction', Ministry of Culture and Islamic Guidance, Tehran, Iran [in Persian]

Emami, H. (2011) 'Linking Traditional Architecture with Wisdom', Information on Wisdom and Knowledge, 6(9), pp. 4-8. (in Persian)

Engebretson, D., Fullmer, D. (1970) 'Cross-cultural differences in territoriality: Interaction distances of native Japanese, Hawaii Japanese, and American Caucasians', Journal of Cross-Cultural Psychology, 1(3), pp. 261-269. https://doi.org/10.1177/135910457000100305

Eskandari, P. (2011) 'Analysis of Traditional Iranian Houses of Kashan, Iran in Terms of Space Organization and Access Design', Eastern Mediterranean University, Gazimagusa, North Cyprus. [online] Available at: http://www.secheresse.info/spip.php?article73735

Evans, G. W., Howard, R. B. (1973) 'Personal space', Psychological Bulletin, 80(4), pp. 334-344. https://doi.org/10.1037/h0034946

Forston, R. L., Larson, C. U. (1968) 'The dynamics of space', Journal of Communication, 18(2), pp. 109-116. https://doi.org/10.1111/j.1460-2466.1968.tb00061.x

Gifford, R. (2002) 'Environmental psychology: Principles and practice', Optimal Books, Colville, Washington, USA, pp. 109-116.

Givoni, B. (1976) 'Man, Climate and Architecture' (2nd ed.), Van Nostrand Reinhold, New York, USA.

Haeri Mazandarani, M. (2008) 'House, Culture, Nature', Urban Planning and Architecture Study Center, Tehran, Iran, pp. 116-131. (in Persian)

Haghparast, F., Niroumand, S. (2007) 'Sustainability of climate-sensitive elements in hot-arid regions; case study: Boroujerdis' house of Kashan', In: 3rd IRCEC Armenia, Yerevan, Armenia, pp. 90-97.

Hall, E. T. (1959) 'The silent language', Doubleday, New York, USA.

Hall, E. T. (1966) 'The hidden dimension', Doubleday, New York, USA. ISBN 978-0-385-08476-5

Hayduk, L. A. (1994) 'Personal space: Understanding the simplex model', Journal of Nonverbal Behaviour, 18, pp. 245-260. https://doi.org/10.1007/BF02170028

Hosseini, S. R., Nik Eteghad, A., Uson, E., Armesto, A. (2015) 'Iranian courtyard housing: The role of social and cultural patterns to reach the spatial formation in the light of an accentuated privacy', ACE: Architecture, City and Environment, 10(29), pp. 11-30. DOI: 10.5821/ace.11.29.2653

Hujjat, I. (2008) 'Architectural education and the worthlessness of values', Fine Arts – Architecture and Urbanism, 14(14), pp. 70-63. (in Persian)

Joklová, V., Bacová, A. (2013) 'Effective housing, methodical concepts for urban and architectural housing design', In: Oikodomos. Innovating housing learning, Hogeschool voor Wetenschap, Gent, Belgium, pp. 200-211.

Kateb, F. (2005) 'Architecture of Iranian houses', Ministry of Culture and Islamic Guidance, p. 165. (in Persian)

Keshtkaran, P. (2011) 'Harmonization between climate and architecture in vernacular heritage: A case study in Yazd, Iran', In: 2011 International Conference on Green buildings and Sustainable Cities, Procedia Engineering, 21, pp. 428-438. https://doi.org/10.1016/j.proeng.2011.11.2035

Khalili, M., Amindeldar, S. (2014) 'Traditional solutions in low-energy buildings of hot-arid regions of Iran', Sustainable Cities and Society Journal, 13, pp. 171-181. https://doi.org/10.1016/j.scs.2014.05.008

Lang, J. (1987) 'Creating Architectural Theory: The role of the Behavioral Sciences in Environmental Design', Van Nostrand Reinhold, New York, USA, p. 352. ISBN 0442259816

Little, K. B., Henderson, C. (1968) 'Value congruence and interaction distance', Journal of Social Psychology, 113, pp. 41-51.

Mahdavinejad, M. (2002) 'Necessities of mosque design based on social cultural functions', Armanshahr Journal of Science & Research, 5. (in Persian)

Mahdavinejad, M. (2004) 'Islamic Art in challenge with contemporary concepts and new horizons', Journal of Fine Arts of the University of Tehran, 12. (in Persian)

Mahdavinejad, M., Mansour Pour, M., Qeiderlou, K. (2013) 'Privacy in the model of native housing and its withdrawal in contemporary architecture of Tehran', In: 'Contemporary identity in DC's of great city of Tehran', Tehran Beautification Press, Tehran, Iran. ISBN 9786007048498. (in Persian)

Mahdovinejad, M., Mashayikhi, M. (2010) 'Mosque design requirements based on cultural-social functions', Armanshahr scientific-research biannual, 5, pp. 56-59. (in Persian)

Masoud, A. B. (2020) 'Contemporary Architecture in Iran: from 1925 to the present'. [online] Available at: https://www.researchgate.net/publication/342216429_Contemporary_Architecture_in_Iran_from_1925_to_the_present. ISBN: 979-8620711642

Muassasah i Jughrafiay i va Kartugrafi i Sahab (1972) 'Naqdhe bioclimatic Iran = Bioclimatic map of Iran', David Rumsey Map Collection. [online] Available at: https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~318289~90087050#

Naghizadeh, M. (2000) 'Hierarchical wisdom in architecture and urban planning. Collection of essays of the second congress on the history of architecture and urban planning', In: 'Contemporary identity in DC's of great city of Tehran', Tehran Beautification Press, Tehran, Iran. ISBN 9786007048498 (in Persian)

Nasrollahi, F. (2009) 'Climate and energy responsive housing in continental climates', TU Berlin, Germany, p. 279. ISBN 978 3 7983 2144 1

Nayyeri Fallah, S., Khalili, A., Rasdi, M. T. B. M. (2014) 'Cultural Dimensions of Housing Entrance Spaces: Lessons for Modern HDVD Housing', Journal of Applied Sciences, 15(2), pp. 173-183. [online] Available at: https://scialert.net/abstract/?doi=jas.2015.173.183

Nayyeri Fallah, S., Khalili, A., Tajjuddin, M., Rasdi, M. (2015) 'Privacy as a cultural value in traditional Iranian housing; Lessons for modern Iranian high density vertical development (HDVD) housing', International Journal of Architectural Research, Archnet-IJAR, 9(1), pp. 198-216. https://www.doi.org/10.26687/ARCHNET-IJAR.V9I1.324

Niay Gharaei, F. M., Rafieian, M., Jalalkamali, N. (2012) 'Investigating Cross-Cultural Differences in the Privacy Regulation and Perception of Crowding: Northern and Yazdi Women in Iran', Procedia – Social and Behavioral Sciences, 50, pp. 69-78. https://doi.org/10.1016/j.sbspro.2012.08.016

Nosratpour, D. (2012) 'Evaluation of Traditional Iranian Houses and Match it with Modern Housing', Semantic Scholar. [online] Available at: https://www.semanticscholar.org/paper/Evaluation-of-Traditional-Iranian-Houses-and-Match-Nosratpour/f1671ffdf9aa94326d981bd57debe7937af3cc54

Omer, S. (2010) 'Islam and housing', A.S. Noordeen, Kuala Lumpur, Malaysia, p. 350. [online] Available at: http://irep.iium.edu.my/id/eprint/53. ISBN 9789830653051

Raviz, S.R., Eteghad, A.N., Guardiola, E.U., Aira, A.A. (2015) 'Iranian courtyard housing: The role of social and cultural patterns to reach the spatial formation in the light of an accentuated privacy', ACE: Architecture, City, and Environment, 10(29), pp. 11-30. [online] Available at: https://raco.cat/index.php/ACE/article/view/301293

Remland, M. S., Jones, T. S., Brinkman, H. (1995) 'Interpersonal distance, body orientation, and touch', The Journal of Social Psychology, 135(3), pp. 281-297. https://doi.org/10.1080/00224545.1995.9713958

Reza Haeri, M., EIr. (2012) 'KASHAN v. ARCHITECTURE (3) TRADITIONAL ARCHITECTURE', Encyclopaedia Iranica, XVI/1, pp. 21-33. [online] Available online at: http://www.iranicaonline.org/articles/kashan-v3-traditional-architecture

Saljoughinejad, S., Rashidi Sharifabad, S. (2015) 'Classification of climatic strategies, used in Iranian vernacular residences based on spatial constituent elements', Building and Environment, 92, pp. 475-493. https://doi.org/10.1016/j.buildenv.2015.05.005

Sanders, J. L., Hakky, U. M., Brizzolara, M. M. (1985) 'Personal space amongst Arabs and Americans', International Journal of Psychology, 20(1), pp. 13-17. https://doi.org/10.1002/j.1464-066X.1985.tb00011.x

Sarihi, S. (2015) 'Adaptable Architecture, Via Studying Iranian Vernacular Architecture', 1st International Conference on Human, Architecture, Civil Engineering and City, ICOHACC 2015, Tabriz, Iran.

Seyfian, M. K., Mahmudi, M. R. (2007) 'Privacy in the Iranian Traditional Architecture', Journal of Identity of City, 1(1), pp. 3-14. (in Persian)

Shah, M. (2017) 'Importance of Hierarchy in Architecture', GharPedia. [online] Available at: https://gharpedia.com/blog/hierarchy-in-architecture/

Sommer, R. (1968) 'Intimacy ratings in five countries', International Journal of Psychology, 3(2), pp. 109-114. https://doi.org/10.1080/00207596808247233

Watson, O. M., Graves, T. D. (1966) 'Quantitative research in proxemic behavior', American Anthropologist, 68(4), pp. 971-985. https://doi.org/10.1525/aa.1966.68.4.02a00070