

Explaining the Factors Promoting the Quality of Residential Environments Using the Gender Role Approach in Designing Interior Spaces

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ABSTRACT: A house is the origin of many bitter and sweet experiences and the place for the formation of people's personality and identity. One of the wonders of creation is the presence of different needs in men and women. Hence, designers and architects need to review architectural design to create mental comfort in houses, which consist of two different genders. This study aimed to investigate gender differences and their impacts on residential spaces to provide suggestions for better housing designs. For this, primary concepts about gender were first raised, and then relevant theories were examined to describe the interaction of the concept of gender in a residential space. In the end, the feasibility of appropriate designs, which help promote the quality of a residential environment, was measured. The study methodology was qualitative, which described a desirable housing space. According to questionnaire analyses and a survey of 20 men and women, it was concluded that women tended to focus on details and kitchens, whereas men valued living rooms and halls. In sum, it was critical to separate public spaces from private spaces and to give characters to spaces. The goal of this study was to investigate the factors that affect desirable housing spaces and residential-architectural criteria in giving gender to spaces. Findings revealed gender differences stemming from cultural, social, and historical aspects; therefore, people's genders, along with other factors such as age, tastes, and needs, should be considered in designing spaces.

Keywords: Residential complex design, gender difference, space design, gender and space interaction.

INTRODUCTION

Like human handicrafts, architecture should be tailored to the expectations, needs, and characteristics of its users, because failure to pay attention to the impacts of design factors on human lives could affect users' behavior, too. Therefore, it is critical to understand designers' knowledge of the factors affecting this phenomenon. On the other hand, the presence of a multitude of factors plays a key role in the formation of a building, which may have caused some influential factors in the design of a building to receive less attention, and undoubtedly, the role of gender is one of the factors that has been neglected in architectural designs. When people are in an environment, they are influenced by its characteristics, and given that people spend most of their lives in human-made environments, architecture may have the highest impact on them. An individual's perception of their surrounding environment

can significantly impact their mental state, leading to feelings of comfort or discomfort. This perception is influenced by various factors, including economic, social, cultural, psychological, age, and gender. Psychologists believe that the process of obtaining information from the surrounding environment, processing it, and understanding it differs between women and men. In other words, gender can be defined as a factor involved in perceiving architectural spaces. We know that there are different genders in houses, and this difference of gender causes different needs; some genders make use of some spaces more, and their needs should be understood concerning those spaces (in houses, women tend to be in kitchens and produce needs different from those of men in this space).

For people to enjoy the highest mental comfort, well-being, and convenience, the focus should be on optimizing space productivity.

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In many respects, sub-cultural factors such as ideology, customs and traditions, beliefs, lifestyles, and mental needs highly affect the formation of living spaces, especially housing (Kazemi-Zahrani & Tabaian, 2015). Each building, including a house, is tasked with objectifying thinking using its specific conditions, which help examine a culture (Amos Rapoport, 1969). The concepts of privacy and intimacy in Islam denote separating a private life from external interactions. Also, these concepts denote separating non-mahram men and women, which is aimed at providing family security.

Mortada asserts that a house is a critical factor in achieving a hierarchy of ladies' privacy from audio and visual aspects (Mortada, 2003). Also, Asiah argued that visual privacy can be secured in two situations: first, in a house or a situation related to other houses, and second, in the interior space of a residential environment (Asiah, 2008). This study focused on the subject of gender in spaces, examining people's needs in the house and offering architectural solutions for these spaces. To meet the stated goal, the literature on this subject was investigated, and then the theoretical foundations were examined. In sum, data were collected, analyzed, and the results were presented.

Study Literature

The literature on architecture and psychology can be divided into two categories: The first category consists of studies that have only dealt with the architecture-psychology interdisciplinary and environmental psychology topics. Most investigations in this field focus on assigning gender identities to spaces through architecture. The second category includes studies primarily focusing on the roles of women and men. For this, they investigate the psychology and sociology of men and women. The difference between this study and others lies in its focus on cultural and sociological factors, approached from a gender and environmental psychology perspective. In addition, findings include data acquired from the user's direct contact with an Iranian building; for this, data from questionnaires can greatly contribute to the formation of this study.

A large body of research has examined this subject. The following is a list of research backgrounds done in this area.

Books such as "Iranian house architecture" (Kateb, 2005) and "Traditional Construction Principles in Islam" (Morteza, 2008) can be mentioned.

Articles in this connection include "The Nature and Significance of Privacy" (Eskandari, 2010), "Privacy in Human-Directed Research Based on Islamic Teachings" (Afshar & Nemati, 2010), and "Protecting People's Privacy from the Views of Verses and Narratives" (Shahbaz Ghahfarrokhi & Masoudian, 2012).

Hence, a study of these works can help investigate the physical factors affecting desirable housing based on Islamic teachings, which thus helps employ the factors involved in designing modern housing. For Rapoport, culture as an effective factor in social stability plays a key role in the process of housing formation (Altman, 1993). On the other hand, Altman maintains that privacy denotes a choice performed by an individual for others to access him (Altman et al., 1984). Newell calls privacy the temporary separation of humans from the public environment, employing ownership. He argues that people's changing

conditions in public and private spaces are due to the intrinsic distinction of these two environments. In the meantime, Mortada defines privacy as a religious notion for separating gender and differentiating a private life from public interactions (Mortada, 2003).

Baradaran Heravi and Hamzeh-Nejad (2021) conducted a study, "Reading Types of Motions in Houses Based on Contemporary Privacy Culture" (Case Study: Three selected Iranian contemporary house architecture), concluding that cultural values are influenced by people's attitudes, behaviors, and beliefs. They also suggested that desirable physical arrangements should be proportionate to the Islamic culture between people in contemporary housing. Therefore, understanding a desirable spatial arrangement enables designers to propose such arrangements in contemporary Iranian houses, thereby determining the values of each house's privacy.

In yet another study, "Measuring and Analyzing Theoretical Rules of Desirable Housing Using Public Views", Pourdehghan et al. (2018) concluded that dealing with various housing aspects and their main components could explain some of the main concerns of experts in this area. They also indicated that public roles as stabilizing factors were undeniable. Physical desirability, social desirability, functional desirability, and cultural desirability can be considered as the four dimensions of measuring housing desirability. Findings revealed that people attached the highest importance to social, cultural, physical, and functional factors in measuring house desirability.

Alaei-Rahmani et al. (2018) conducted a study, "Mechanisms to Provide Privacy in Iranian City-Housing Using Islamic-Architectural Representations," which concluded that protecting the privacy of Islamic cities, particularly in housing areas, was a primary principle adopted by researchers, as evidenced by numerous verses and narratives that emphasize the importance of providing housing privacy. However, modernity has brought about changes to contemporary housing designs, which do not meet people's Islamic beliefs.

On the other hand, Mohtasham and Hamze-Nejad (2015) conducted a study, "Explaining Dimensions of Privacy in the Relations of the Interior Spaces of Iranian-Islamic Houses Using Analytical Hierarchy Process," to investigate the dimensions of privacy in the spatial relations of the interiority of Iranian-Islamic housing. The authors also investigated auditory, visual, olfactory, and kinetic privacies, as suggested by experts.

In another study, "The Role of Gender in Evaluating Neighborhood Space Security by Emphasizing the OPTED Approach" (Case study: Middle parts of Tehran's Saboonpazkhaneh Neighborhood), Ghanbaran et al. (2015) suggested that focusing on men's and women's differences in terms of physical aspects has led to different perceptual characteristics. For this, it was concluded that women emphasized the role of all indicators, such as monitoring, access control, management and maintenance, support, and territoriality in perceiving insecurity, while men considered the two indicators of monitoring and control.

Also, Ukhovat (2013) conducted a study, "Comparative Study of Dimensions of Privacy in Traditional and Contemporary Housing Using the BDSR Analytical Mode," which found that predicting privacy is a major aspect of interior design. In this study, he examines the perception of spatial privacy in housing, discussing the predictability of possible

behaviors in traditional housing and its differences with contemporary housing. It was concluded that an impressive transformation was unfolding in contemporary housing privacy, which was growing day by day and caused problems for privacy dimensions.

In a study, "Introduction to the Interaction of Concepts of Gender and Space", [Farzaneh \(2011\)](#) found that researchers need to focus on the primary needs of each human in designing and evaluating spaces, while maintaining that it was impossible to access spaces without regard for these needs. Various factors, including gender, influence these needs. On the other hand, gender differences arise from cultural, social, and historical differences.

In his study "Introvert Characteristics Influenced by Qur'anic Hijab Concepts in Architecture Using a Residential Architecture Approach", [Hashemi \(2010\)](#) maintained that the term Hijab in the Qur'an denotes a veil that separates two realms from each other, with the holy book specifically emphasizing the issue of architecture and housing construction to help protect the family privacy and Hijab. Hence, it is imperative to study and interpret Qur'anic verses concerning the principle of Hijab, which involves the health of the family foundation and its effects in various areas, especially in architecture in the form of the separation of private and public realms. This article investigates the principle of Hijab and privacy protection in detail through a fundamental theoretical study of traditional and modern residential architecture. Findings indicated that family privacy in traditional residential architecture involved lighting, dominance and overlooking, accessibility, hierarchy, being open and closed, which fully conform to Qur'anic verses. Meanwhile, in a modern society, the process of privacy protection has led to the loosening of familial and social ideological foundations. By employing the past approach and following architectural creativity in implementing Hijab within residential architectural contexts, along with a rational analysis, it is possible to provide mental security to people, particularly girls and women who are marginalized in society. This, in turn, can strengthen their religious foundations and morale within an Islamic family.

In a study "Anthropological Image of Spaces in Iranian Architecture (Woman-oriented Approach in Society)", [Mohammadi et al. \(2009\)](#) found that space organization in Iranian architecture is constantly in an equal interaction with sociological and anthropological sciences that have inspired space formation. Social-cultural and social-ritual functions have had an undeniable role in the formation of architectural and urban spaces, both on micro and macro scales, while engendering interesting research feedback. Iranian spaces are characterized by the creation of superior environments and special values, and consequently, the employment of transparent qualities and addition of synergic space properties, which are affected by the congruity of behavioral and physical images.

This study aimed to investigate the actions and reactions on the levels and walls of spaces and their effects on human relations, spatial orientation, and the satisfaction of human needs. This study also uses simple physical patterns or phenotypes, as well as diagrams, to examine the relationship between behavioral patterns and finally present suggestions for designing women-suitable spaces within the Iranian architectural context.

Theoretical Foundations

A house is one of the most important and oldest human material achievements; it is the origin of many humans' sweet and bitter experiences and a place that underlies their character and identity foundations. It is a space that separates men's and women's roles, thereby habituating humans to their respective roles. A house, as the most comprehensive architectural type for linking humans and their lives, plays a critical role in human lives ([Hashemi-Azarvand, 2010](#)). One of the wonders of creation is the differences between women and men, which has attracted the attention of experts and scholars and has become a turning point in conducting studies on women and comparing them with men. The study of gender and sexual differences has always been of interest to researchers. After numerous studies and investigations, biologists and researchers concluded that the mental and intellectual behaviors of women and men are inherently different in some basic traits and act differently under the influence of gender. Various psychological studies have consistently indicated differences between men and women. Some differences may include intelligence and talents, moral judgments and growth, aggression and its types, self-esteem, coping styles, anxiety and depression, other mental disorders, religiosity, association with groups, risky behaviors, communication styles, and empathy criteria in choosing spouses and sexual behaviors. Instead of attention to these differences, psychology has sought to ignore or belittle them and attributed them to stereotypical perception and sexual discrimination; meanwhile, despite these findings, the above differences are undeniable ([Rezazadeh, 2014](#)).

As gender differences create different needs, designers and architects need to review interior designs to create mental comfort inside families and houses, which include individuals of both genders. If gender needs are not met, the house will not be desirable or livable for men and women. This study investigated gender differences and their impacts on gender spaces by proposing suggestions about interior designs to improve the design process. This research examines gender differences and their impacts on gendered spaces, providing suggestions in the field of interior design to improve the design process. Therefore, this research aims to find a solution that advances the interior design of living complexes, taking into account individual gender, and to design spaces that understand and meet the distinct needs of men and women. In addition, this research identifies gendered spaces and proposes solutions to address existing issues, enabling people to experience a better sense of well-being at home and enjoy greater mental peace in these spaces. Interviews were used to measure people's views and to provide architectural solution results.

Housing

A house is a place for residence and being ([Dehkhoda, 1998 & Moein, 2012](#)). The term house refers to a domicile where one rests and takes shelter. This term encompasses a range of physical and conceptual concepts ([Maleki & Sajjadian, 2016](#)). The term house is both a physical place and an entire residential environment ([Alaei-Rahman et al., 2018](#)). It can be said that the general definition of housing is more than just a physical shelter that includes all the services and facilities necessary for an individual's well-being ([Hakimi, 2011](#)).

Gender

One of the first major concepts in this study was gender. Sociologically, male and female genders refer to several differences between men and women (Rendell et al., 2000). Gender is defined as a macro-social image of masculine and feminine norms (Kazemi, 2009). Although gender differences are based on sexual differences, they arise from cultural, historical, and social factors (Ritzer, 1995). Different approaches between men and women regarding the environment and moral principles governing their behaviors, as well as different men's and women's needs in using spaces and their different approaches, should be considered in designs (Rezazadeh & Mohammadi, 2008).

Space and Gender Interaction

A novel subject of interest is whether the space is gender based or not. There are various questions surrounding a gendered space, i.e., whether it is a product of an architectural plan. Regarding the interaction between space and gender, special places may conform to the biological sex of the individual present or to the gender associated with the activity being performed. For example, men's and women's WCs are characterized by their intended use, as men and women typically use them. In the meantime, the kitchen is often associated with the female gender because the activity of cooking is socially attributed to women.

On the other hand, the study of space and gender is an interdisciplinary subject, and those who believe in gender in urban spaces have acquired their theories from theoretical approaches in different disciplines such as Geography, Anthropology, Psychoanalysis, Philosophy, as well as political and cultural sciences. It is noteworthy that these disciplines are interrelated with spaces and spatial talents. From geographical and anthropological perspectives, a space is produced socially and culturally, with gender relations formed in cultural, social, and spatial forms. Here, two questions are raised: "How are gender relations revealed in spaces?" and "How are spatial relations represented in gender?" The geographers David Harvey and Edward Soja believe that a space is a social product and is hence key to a social product (Rendell et al., 2000). Anthropologists maintain that a space is cultural and an

architectural plan is a cultural topic. A space is not intrinsic to a resident; rather, it is an integral but changeable part of daily life, associated with social and personal activities and social customs (Farzaneh, 2011). The philosopher Henri Lefebvre argues that, as a space can be materially produced, it is also produced by a concept. To him, the social product of a space interacts together through the following three cases:

1. Spatial function: Material and functional spaces
2. Space representation: A space as a coded language
3. Representational space: Daily life experience in space (Rendell et al., 2000).

The historian Henri Grisleda Pollok suggested that gender-based spaces include the ideology of realms and separated areas.

Role of Gender in Perception and Efficiency of Architectural Space

Gender can be considered the representation of men's and women's social and cultural identity in a society; gender is thus balanced based on various religious, social, and cultural factors, as well as values and norms (Varmaghani & Sultanazadeh, 2014). Research on gender has recently entered the category of architectural and urban spaces, in particular. In sum, identifying differences between men and women can play a major role in shaping the behaviors of each party. It is thus necessary to be acquainted with these differences for compatibility, vitality, comfort, and health in personal and social lives. On the one hand, other aspects in social settings and space designs concerning the mentality of both genders can be included (Lelhaj & Mousavi, 2014). Concerning mutual relationships between space and gender structures, space plays a major role in the realization of gender communications and their reproduction. Separating spaces based on gender helps increase women's accessibility to spaces. Jane Rendell refers to some of the factors involved in forming gender spaces as follows:

1. Design and architecture of spaces, considering the type of gender
2. Critical, historical, and ideological theories, and
3. Daily changes in people's activities

Adler has analyzed men and women-specific spaces and investigated the role of spaces and their symbols from a cultural point of view. She

Table 1: Effects of gender on perception (Mashayekhi, 2020)

| | | | |
|--|--|-------|---|
| Effects of gender and gender roles on perception | Subjective embodiment, three-dimensional perception of space | Woman | Aesthetics, two-dimensional perception, manual skills, rapid reactions, verbal abilities |
| | | Man | Spatial perception, mathematical and rational reasoning |
| | Perceiving visual elements of space | Woman | Partial perception, high visual perception, high color perception, light sensitivity |
| | | Man | General perception of weak color perception, eye, and hand harmony |
| | Perception and auditory embodiment | Woman | High auditory perception, hearing a voice without the ability to orient accurately |
| | | Man | Low auditory perception, accurate orientation by using auditory perception |
| | Perception of social spaces | Woman | Focus on several tasks at a time, engage in mutual-understanding conversation, foster sensitive and sympathetic social relations, and use testing and confirmatory words. |
| | | Man | Individualistic and self-oriented social relations, decisive words, reporting conversation, and focus on several tasks at a time |

maintains that human-averting people prioritize buildings with complex internal relations and transparent external realms (Mashayekhi, 2020,47). To Foucault, gender is a strategy to administer, produce, and monitor people and their social relations; however, a space is formed in adjacency with gender. Gender refers to how space is allocated and the behaviors that occur within the spaces used. In other words, the various ranges of a space are appropriate for gender, while the presence and behavior of another gender within these ranges are not acceptable (Bidar et al., 2019). Below, Table 1 details the impacts of gender and gender roles on perception

Meaning of a House

The term "house" involves a large spectrum of human needs and demands. A house requires various spaces, including places for sleeping, cooking, eating, and personal cleanliness, all within a single unit. People use a house and a lifestyle, represented in a house, to introduce themselves. The place an individual selects for living reveals its advantages and limitations. Meanwhile, the size, form, and furniture in a house, as well as the manner of residence in it, can affect the subjective status of people inside that house. The planning of a residential unit should not just focus on key functions and costs of construction, but rather the creation of life quality should be considered. The needs of house residents are major elements of a design. If the plans are designed for a specific person and if future house residents are already recognized, their ideas can be directly focused, and thus a customized house can be constructed (Krebs, 2017). A house is one of the most critical needs in an individual's life, as it forms cultures and opinions that reflect the global worldviews of a nation (Elahizadeh & Sirousi, 2014). It is thus imperative to focus on the fact that people in each society have their specific ideology based on their social and cultural conditions (Atapour, 2015). Meanwhile, this is culturally expressed as technical solutions of a shelter, religious beliefs, and aesthetic values (Vasigh & Pashtounizadeh, 2011). Since an Iranian house represents a Muslim house, it indicates the continuation of cultural norms, religious beliefs, and the protection of privacy in Islam (Abdul Rahim, 2012).

According to research, concerning the subject of housing and residence, there are experiential relations in a house environment, which involve communications between man and the environment, as well as a focus on privacy. Hence, adapting movement between man and the environment in the form of kinetic systems is a key issue in housing

component arrangement, because it helps create privacy between people in their surrounding environment. Experiential relations in a house environment are divided into two types: subjective (subjective) and physical (objective) movements. In this context, communication with nature is categorized as a factor influencing semantic or subjective movements within a house. Meanwhile, movements in physical dimensions can be controlled by visual, auditory, and olfactory tools (Heravi & Hamze-Nejad, 2021). A house serves as the most private individual realm that requires full maintenance of privacy in its physical forms. Table 2 gives the criteria for privacy in this connection.

A study of Iranian society reveals that people's lifestyles and attitudes, rooted in the past and Iranian and Islamic cultures, have been largely introverted. However, Iranian houses have undergone significant transformations due to the adoption of Western culture, with apartment life and new coexistence methods largely changing private and semi-private lives and transforming modern house lifestyles (Mahdavi-Nejad, 2002). On the other hand, open and semi-open spaces produce the least benefits due to the lack of privacy. In houses, too, the lack of space has led to problems with private and public lives (Alaci-Rahmani et al., 2018). Therefore, desirable housing serves as a major constituting element that forms life (Rokenedin Eftekhari & Mirjalali, 2014).

Table 3 explains how four-part privacy within the interior space of the house must be protected:

House designs create sequences of events that are influenced by many factors inside and outside houses. The most important criteria for comparison in this context are the individual's primary needs, the specific environment surrounding their residence, and design principles and methods. Necessary considerations for each residential unit are as follows:

Private and Public Spaces

Spaces can be described based on the public's accessibility. Depending on the type of use, dimensions, and qualities defined for a space, it can enjoy a private and public identity, which can be determined rapidly and thus directly affect an individual's behavior in the space. The boundary between public and private spaces is often murky because public and private uses are mostly blended and changing. A private or public space is characterized by dimensions, the degree of control and permeability, as well as the number of types of openings within a spatial structure. A private space is a type of space that involves people's private lives. A private room and an apartment are conventional private spaces. These

Table 2: Privacy criteria (Adopted by Mohtashem & Hamzeh-Nejad, 2015).

| Main Criterion | Sub-criterion | Significance |
|----------------|-------------------|--|
| Privacy | Visual privacy | Getting permission to enter another space to avoid the non-mahram's view |
| | Auditory privacy | Avoiding inconvenience for other members of the house and avoiding overhearing |
| | Olfactory privacy | Avoiding resentment between people and neighbors to associate with each other, avoiding the harassment of passersby, and using smells created inside |
| | Kinetic privacy | Focus on the manner of entering a space using specific customs. |
| | Mental privacy | Focus on people's morale. |

Table 3: Observing four types of privacy in the interior spaces of a house (Taken from [Mohtashem & Hamzeh-Nejad, 2015](#)).

| | Kinetic privacy | Olfactory privacy | Auditory privacy | Visual privacy |
|------------------|---|--|--|---|
| Kitchen | Accessibility to reduce the path to transfer raw materials, and access to hall spaces | the odor of cooking | Sound of dishes and stages of cooking | Women's convenience in cooking and keeping the mess of the kitchen out of the view of guests |
| Parental room | Fully private space requiring permission for entry | Smell of a hygienic space in the parental room | Observing the auditory privacy for the specific parental relations | Private spaces for couples' relations, the convenience of people's clothing in sleeping rooms |
| Child room | Full private space | Smell of a possible hygienic space in the room | Sound of children's games, telephone contacts | The convenience of clothing and the behavior of people in the sleeping room |
| Entrance | Lacking unhindered accessibility to the interior space | With olfactory contamination from contact with the outside | With noise pollution due to contact with the outside | Avoiding house interior spaces from being seen |
| Living room | Semi-private spaces | The smell of consumed candies in a family | Sound of members of the family speaking together | Semi-private spaces due to people's use |
| Halls | Public spaces and reduced observance of kinetic privacy | Smell of food in integration with the dining space | Creation of collective sounds | Public spaces and reduced observance of visual privacy |
| Bathroom and WCs | Fully private for each individual | Unpleasant smells | Water and washing sounds | Fully private spaces for each individual by focusing on relevant uses |

structures are designed based on human scales and defined by activities and objects not shared by the public. These spaces include openings, which, when closed or opened, can help residents control the presence and communication of various people with each other ([Eksener & Detrich, 2016](#)).

Orientation

Natural light is a major qualitative criterion in a house. Small and large openings exhibit marked differences in their ability to transfer light inside. It is also critical to understand sunlight directions, i.e., north, south, east, and west. Planning for energy consumption and waste in a building is also influenced by the relative position of the sun. Depending on the season and climate zone, solar energy shines into rooms through windows with varying intensities or is blocked by solar skylights to prevent excessive heat and glare.

Meanwhile, planting trees and vegetables, installing canopies, balconies, and protruding ceilings can be used to prevent extreme sunlight. However, small windows or a lack of them can be regarded as reasonable solutions, under certain conditions. This situation also applies to cold climates, where a large part of the heat energy is wasted through northern windows of buildings ([Krebs, 2017](#)).

Local Characteristics

Local characteristics, including surrounding buildings, roads, and open spaces, as well as topographic features and trees, influence the design of residential units and define space orientations for various land uses in a plan. For example, during the design phase, noise from busy roads or neighboring buildings can be prevented by using secondary and side rooms or by appropriately reducing the facade openings. On the

other hand, appropriate views of the surroundings, as well as secluded and enclosed outdoor spaces, provide the possibility of thoughtfully opening up the facades so that the outdoor space may penetrate the interior design of the space, and an interaction emerges between them.

Boundaries

Boundaries primarily serve to define an area where others are not entitled to approach. Using various tools to exhibit a boundary can remind others of the extent to which it is protected. For example, using stone and thick boundaries can convey a sense of protection to the viewer, while symbolic boundaries, such as flowers and narrow strips, may help the viewer perceive this symbolic boundary, thus forbidding others to transgress the privacy. In-house space without boundaries, women have less presence and are less engaged ([Vahidi-Motlagh, 2010](#)).

Religion and Denomination

The rise of Islam and Shiism in Iran brought about some changes to Iranian thinking and viewpoints. This resulted in the lifestyles of Iranians and their living spaces taking special forms based on this thinking process. The separation of women's and men's spaces, consistent with Islamic rules, aimed to make women's living spaces healthy and secure, leading to the formation of an architectural space fabric. In residential architecture, which is the prelude to the privacy and comfort of Iranian women, the interior space was separated from the exterior space, with non-mahram people unable to see through the private space of life. Although the factors of religion and denomination cannot be regarded as the sole effective influences in this type of architecture, religious thinking processes and religious perfection are

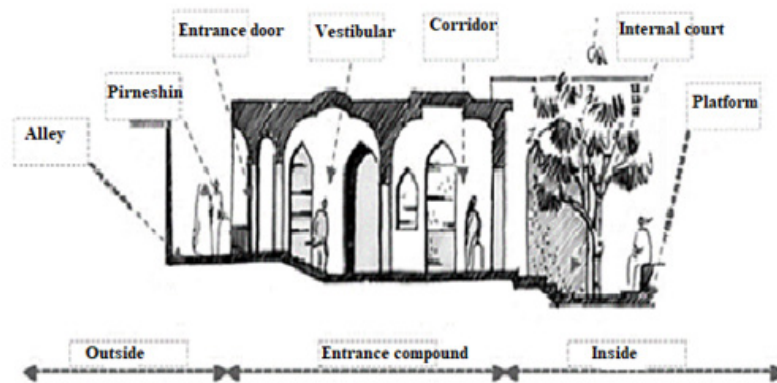


Fig 1. Hierarchy of entrance compound in traditional Iranian houses (Source: [Nayeri-Fallah, 2013](#))

the most important reasons for the formation of architecture, resulting in respect and privacy among Iranians ([Jalili, 2010](#)).

Figure 1 shows how the hierarchies of traditional Iranian houses are considered.

Indicators Representing Privacy and Hijab in Traditional Residential Architecture

Traditional Iranian houses are places where women wear hijabs. These houses are characterized by tall walls, special corridors, the lack of windows and openings toward outside, ridges higher than human height on rooftops, thick walls, voluminous spaces and the combination of spaces, and house depression inside the ground, which make the houses away from visual (non-mahram's direct views) and auditory violations (overhearing and exchange of voices between residents in residential units). Inside the houses, the combination of spaces and the volume of the ground floor, the basement, and even the rooftops help distribute and continue privacy hierarchies inside houses based on the type of combination of people in the family ([Ahmadi-Nejad, 2010](#)).

Location

Locating is a perceptual process ([Schultz, 2010, 34](#)). Various places produce different perceptions and understandings for people ([Tibbalds, 2006, 63](#)). Appropriate locating is key to protecting privacy and establishing good communication between interior spaces in a house and its components ([Alaei Rahmani et al., 2018](#)). Hence, not all auditory and visual access between guest spaces and private rooms is allowed, as the house should be so designed to protect the privacy between private and public areas fully. It is essential for a house entrance to be located in a manner that protects privacy, with no transgression allowed. On the other hand, windows should be positioned to avoid overlooking others, even if natural light and air ventilation are necessary ([Ukhovat et al., 2010, 159](#)).

Hierarchy

A hierarchy defines the relationship between various house areas, including private and public areas ([Tabibian et al., 2011](#)). In housing, observing the principle of hierarchy will lead to the formation of spatial territories characterized by different functions and spatial private

zoning, because passage from one area to another will be mentally and physically undesirable without creating an ante-space. Thus, failure to observe privacy and interference in areas could reduce the qualitative desirability of spaces ([Seifian & Mahmoudi, 2007](#)).

Introversion

Many Islamic values are embedded within introversion. Introversion is characterized by a greater focus on the inside than the outside, attention to chastity and modesty, the absence of luxury and show-off, and physical unity ([Pirnia, 2002](#)). In contemporary housing, unlike traditional housing, social and economic representations are revealed by the external views of houses. In the internal spaces of traditional houses, spaces are so combined to align the association of private, semi-private, and public spaces with other social, ideological, and cultural systems of the public. In the meantime, in contemporary houses, the boundary between public and private spaces is largely blurred, with the former in the new spatial system turning into a semi-public space, an example of which is the formation of kitchens ([Noghre-Kar & Raeisi, 2013](#)).

MATERIALS AND METHODS

This study employed a qualitative method and fell under descriptive-analytical research to provide an overall framework of user needs and demands concerning favorable housing. For this purpose, it specified the criteria that determine how the quality of the housing environment could be improved by considering the role of gender in influencing the interior environment of the house.

The study also took two stages to receive and process data. In the first stage, expert views and library studies were examined to elicit the study components. The second stage provided a general understanding of popular views through oral interviews and audio questionnaires with a limited statistical population, which significantly contributed to identifying a subjective and perceptual framework and explaining the intended indexes of the study. The changes identified in the spatial structure of the house involved spatial hierarchies, gender territories, and privacy, each with subsets of public and private space separation, the first and second kitchens, open and closed kitchens, a non-view of a space, space characterization, proximity of bathroom and WCs to

bedrooms, using flowers and plants, and transparent and illuminated spaces. These factors are aimed at investigating the relationship between space and gender and masculine and feminine structural differences, which resulted in creating various tastes in designs. The literature review has utilized the library method and reviewed research contexts. For this purpose, relevant literature was extracted from credible sources.

Additionally, a field survey was conducted to collect questionnaire data, providing favorable housing indexes based on gender and the extent to which this factor affects housing. Hence, to better investigate the available factors in space designs, a questionnaire and a survey were used. According to the study's subject, the statistical population consisted of 20 individuals (an equal number of men and women), selected through a random sampling procedure that included groups of varying ages and educational backgrounds. Hence, this subject has become significant in designing the interior spaces of the house and needs to be focused on by designers so that it brings about mental comfort for the residents.

RESULTS AND DISCUSSIONS

According to scholars, gender, as a concept, falls under social and cultural categories and affects people's perceptual differences. To them, if the space is not designed with gender in mind, it will be met with dissatisfaction. In designing various house spaces, gender serves as an organizing element, thus resulting in user satisfaction. The first component of this study focused on the separation of public and private spaces, specifically examining how men and women perceive and interact with the architectural boundaries that define these areas. The separation of private and public spaces involves the subsets of public spaces, semi-public spaces, semi-private spaces, and private spaces.

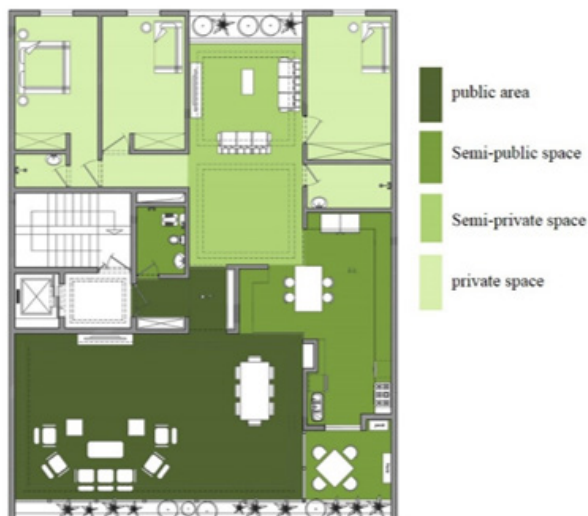


Fig 2. Separation of private and public spaces

The findings showed that 45% of women and 20% of men attached significant importance to this factor. This is indicative of the fact that the separation of public and private spaces is crucial and characterizes the spaces. The second component, which pertained to both the first and second aspects, as well as the open and closed kitchens, drew the attention of 65% of women and 50% of men. This suggests that the kitchen and its details are more important for women.

On the other hand, some women referred to the first and second kitchens, arguing that this specific style of kitchens could contribute to creating more mental security and comfortable working environments in the space while underscoring the gender of people in the space, which is also culture-specific. The third component pertains to the space character, with 40% of women and 35% of men paying special attention to it. The space character is a critical element because it plays a major role in human conduct and influences their character. It is widely understood that each individual requires a certain space, whether it is a bedroom or a working room with a desk in it. More importantly, applying specific design principles could help the space take on a distinct character or identity and better suit people's needs. The fourth component was using flowers and plants, as 14 people of the statistical population and 70% of men and women (35% of men and 35% of women) were found to show a willingness to use natural elements such as flowers and plants. Thus, a space is required to be considered to meet this need.

The fifth component of this study involved a space characterized by a lack of view and a maintained hierarchy. Findings showed that 45% of women and 30% of men paid attention to this and were quite sensitive to it. It was found that people needed more secluded spaces far from view to enjoy mental security and to feel more comfortable. This was indicative of the significance of the category of gender. The sixth component was the distance of the WCs and bathrooms from the



Fig. 3. First and second or open and closed kitchens



Fig 4. Space characters

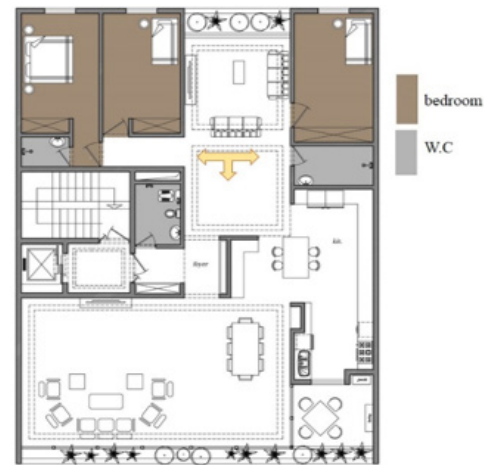


Fig 5. WCs' distance from sleeping rooms



Fig 6. Illuminated and bright spaces



Fig 7. Non-view of space and hierarchies

bedrooms.

Since each space is prioritized for a specific gender, the majority of women were inclined to see the bathroom and the WC to be located near the bedroom. Furthermore, speaking of gender, some people were found to refer to the so-called audio privacy, with 35% of women and 30% of men focusing on this issue. The last component in the study concerned the transparent and illuminated spaces, as men and women were equally found to pay attention to it, considering it a critical element in the house. Meanwhile, 90% of women and 95% of men had also called for this element to be considered. Figures 2 to 7 exhibit the illustrative representation of the indices discussed above.

According to Table 4, interview analyses showed that some of the factors under study were equally important for both genders; hence,

no significant difference can be found between the two genders. The key point, however, was that women were more focused on details and the kitchen, while men paid more attention to the living and dining rooms. It is notable to suggest that people are more conscious of their daily architectural styles and needs than in the past; thus, findings from the statistical population of this study and the interviews with people suggest that they have gained more knowledge in this connection. Hence, interviews with people before design can help identify their needs and provide an environment that best meets their needs and tastes; this will certainly result in more mental security and comfort. As found, people's genders are key in designing spaces and their needs, as spaces reveal different priorities for different genders. Thus, gender, like other factors such as age, taste, and needs, should be considered in designs.

Table 2: Comparison of geometric and numerical cognitions in the design of structural aspects

| | Gen-der | Separation of private and public spaces | First and second kitchens | Open kitchens | Closed kitchens | Non-view of space | Space characters | Proximity of WCs and bathrooms to the rooms | Use of flowers and plants | Illuminat-ed spaces | Bright spaces |
|-------|---------|---|---------------------------|---------------|-----------------|-------------------|------------------|---|---------------------------|---------------------|---------------|
| 1 | Woman | * | * | - | * | * | * | * | * | * | * |
| 2 | Woman | * | * | - | * | * | * | * | - | * | * |
| 3 | Woman | * | - | * | - | * | * | - | - | * | * |
| 4 | Woman | * | * | - | - | * | * | * | * | * | * |
| 5 | Woman | * | - | * | - | * | * | * | * | * | * |
| 6 | Woman | * | - | - | - | * | - | - | - | - | * |
| 7 | Woman | - | * | - | - | - | - | - | * | - | * |
| 8 | Woman | * | * | - | * | * | * | * | * | * | * |
| 9 | Woman | * | * | - | * | * | * | * | * | * | * |
| 10 | Woman | * | - | * | - | * | * | * | * | * | * |
| 11 | Man | - | - | * | - | - | * | - | * | * | * |
| 12 | Man | * | * | * | - | - | * | * | * | * | * |
| 13 | Man | - | - | - | - | - | * | - | * | * | * |
| 14 | Man | - | - | * | - | * | * | * | * | * | - |
| 15 | Man | * | * | * | - | * | * | - | * | * | * |
| 16 | Man | - | - | - | * | * | - | * | * | * | * |
| 17 | Man | * | - | * | - | * | * | - | - | * | * |
| 18 | Man | - | - | - | * | * | * | * | - | * | * |
| 19 | Man | - | - | - | - | - | - | * | * | * | * |
| 20 | Man | * | - | * | - | * | - | * | - | * | * |
| Total | 20 | 13 | 8 | 9 | 6 | 15 | 15 | 13 | 14 | 18 | 19 |

CONCLUSION

The user would gain a better understanding of their needs if they better comprehend the various aspects of architectural work. This, combined with appropriate implementation, would result in a design that incorporates favorable spatial features, thereby creating user satisfaction. The study findings revealed a significant relationship between gender and the separation of areas in an architectural space. To provide a favorable housing space that meets the needs of both genders, some factors were examined. The findings also revealed that designers design spaces based on gender, which may sometimes be rational, especially in societies where men and women are separated based on governing cultures. In sum, places may be specified by gender features due to people's gender or activities. The establishment of a desirable space for both genders in residential houses requires separating public and private spaces and avoiding views of private sections to the extent possible, so that the security and comfort of the residents are increased. Also, the proximity of WCs and bathrooms to sleeping rooms was found to create convenience for people, especially women. Lighting in houses should also be focused to create lively and dynamic spaces. According to studies on giving gender to house spaces, spaces that are mostly used by a specific gender should be designed to meet the needs of that gender. For example, the kitchen, which tends to be spatial, should provide no view of women from the entrance door,

while maintaining its visual privacy and enjoying adequate light and ventilation.

Meanwhile, a working room can be considered for men so that they can easily do their work. This room should be well-lit and ideally placed in a quieter, more private part of the house. In sum, architectural principles should be investigated in houses based on people's gender needs; for this, the following can be proposed:

Gendered territory:

- Meeting the principle of hierarchy in designs
- Utilizing doorstep sections and spatial location for a pause
- Designing separate WC services for guest use
- Providing a design tailored to modern user needs and Iranian culture
- Visual impermeability and the proper location of the entrance through a filter
- Locating the dining section in a separate area with a view restricted to the private area due to high social interactions

Spatial hierarchies :

- In contemporary housing, pausing spaces for waiting can be designed for the entry of strangers by using the idea of a vestibule in traditional architecture
- Separating private spaces from each other based on the level of privacy, and
- Using natural and artificial ventilation in spaces such as kitchens and

WCs by creating curtains or olfactory curtains

Privacy:

- Designing guest-specific sleeping rooms in sections separated from the family's private sections
- Using balconies with lattice walls
- Using single or double-glazed walls, along with insulators, to prevent sound diffusion and protect the auditory privacy of private spaces
- Using secondary corridors to make spaces more private and communicative between the private and public sections
- The strategic placement and design of pause spaces throughout the house can help reduce the unit's centrality and improve focus in multiple areas.
- Locating the kitchen and the dining room close to each other, but with obstructed visual separation or a split level to preserve privacy
- Locating the dining room close to an open space
- Introversion and maintaining security and privacy
- Visual security and lack of overlooking

According to user findings and views, meeting the needs of users is increasingly critical due to their gender preferences for architectural spaces. Gendered designs can enable designers to create conditions that lead to user satisfaction. For this, space designs should meet user needs and create efficiency and favorability for them.

Forming part of social and cultural factors, gendered relations influence the way housing is shaped. To Rapaport, culture involving religious beliefs, social communications, and lifestyles plays a key role in housing spatial divisions.

This study investigated the factors of promoting residential environmental quality based on gender and space configuration, as seen in modern housing, distinguishing three factors of gendered territory, spatial hierarchy, and privacy. However, it is beyond the scope of this study to determine whether or not these factors would help meet the favorable properties of a space that best suits both genders. Concerning gendered territories, the key subject in the relationship between gender and space is the formation of gendered areas represented by the degree of enclosure of the space or the connectedness of the areas. Concerning the spatial hierarchy, it is not possible to pass through a public space directly. Hence, a space like a joint should help to detach a public space from the interior space. As is known, privacy also serves as a basic interest in all cultures, and creates boundaries and detachment, thus affecting life and social relations in architecture.

It should be borne in mind that much research needs to be done in this regard. For this, future research is recommended to:

- Explore behavioral and activity models in traditional Iranian houses and regenerate them to examine their various aspects, and
- Engage residents in the course of the research and use their views

AUTHOR CONTRIBUTIONS

S. M. Tbaeian supervised the research stages, reviewed and controlled the results, and finalized the article. E. Abedpour conducted data collection, review, and revision of the article, and preparation of the initial text. A. Sadr Ameli drafted the article.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of

this work. In addition, the authors have witnessed several ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancy.

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