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Assessing Inconsistent Housing Architecture Components in the Last Four Decades; Emphasizing House Residents' Views in the Middle Texture of Kermanshah City, Iran*

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ABSTRACT

Assessment of the living process after construction is one main issue in the architecture context, which reveals the success rate of an architectural work considering its residents. If this assessment is done in home components as a pattern within different frequent periods, it can shape some homes that are more compatible with their residents in the future. Evaluation of incompatibilities created in building components of a home obtained through atomism studies is done in the real world by comparing the status quo and the desired state of the home in the residents' view. This study is mixed in terms of nature with applied, descriptive-analytical type, and is a library and field study in terms of data collection. The data are collected through a questionnaire. The statistical population comprises 950 families living in the middle texture of Kermanshah City, Iran. According to the Cochrane Formula, 273 people of this population were selected as sample size who lived in this area during summer 2021. Data analysis is done using SPSS software. The results obtained from the one-sample t-test, significance rate of SIG, and average frequency of data in comparison between the status quo and desired state indicate that some incompatibilities exist in homes' components that are different in various decades. Moreover, it is concluded based on the residents' answers that a home may be desired by its residents due to its integrity even if it has some adverse components. Comparison between home components in different decades would lead to 11 incompatibility criteria in homes, which include the creation of spaces without considering residents' behaviors, lack of valuating spaces, removal of interface spaces, being obliged, lack of permanence, lack of connection with the context, control weakness, disappearance of landscape, decrease in spatial diversity, reduction of diversity in homes, and economic issues.

Keywords: House Architecture, House Components, Inconsistency, Residents' Views, Middle Texture of Kermanshah.

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1. INTRODUCTION

It can be stated that "How is the architecture of home" as a place suitable for living and settlement of humans has been always a question asked by architects, researchers, and even residents of the home. This is a question about the home that goes back to human life. Human indeed looks for residence and peace in the world, which today may not have the necessary quality for their lives (Aghalatifi and Hojjat 2019, 42); because existence in the world not only includes being where but also comprises how to live (Norberg-Schultz 2019, 20). Regardless of its physical dimensions, this home becomes meaningful and is shaped under the influence of cultural factors of society, residents, and their views (Khakpour, Ansari, and Taherian 2010, 3). Physical, functional, social, and semantic dimensions have indeed played a vital role in the formation of home over the time (Bakhtiary Manesh and Bemanian 2023, 38). This manner has been surely changed due to various factors over the years of human lies. These changes are inseparable parts of human life (Aghalatifi 2019, 17), and lead to evolution in human lifestyle due to time passage and man's achievements in various aspects of technology, science, industry, and agriculture. These evolutions have certainly changed the architectural body of the home (Alalhesabi and Korrani 2013, 20), which may be compatible or incompatible with residents. In this regard, it can be explained that the architecture of the home has the most complexity due to its continuous connection with the daily life of people (Asefi and Imani 2016, 59). The complexities that result from the interaction between various and wide range of historical, cultural, social, political, economic, end environmental fields, and have a direct effect on the formation of homes and their bodies (Ebrahimi and Eslami 2010, 5). Fast changes and development in the world, regardless of the taken path or the goals we have considered, have had adverse effects on the architecture, especially in the field of home design in terms of quality (Asefi and Imani 2016, 59). The question here is that these evolutions have occurred in which components, how much they created incompatibility, and what relationship exists between these changes and demands or ideals of home's residents. This case can be grasped by referring to residents with all of their characteristics and assessment of the relationship between them and their living places after finishing the construction process of the home. This effort indeed can be effective in forming homes with higher and better compatibility with residents.

Accordingly, the necessity of this research in the first step is to identify the home components referring to the research background. The second step includes assessing these details in the homes with the most frequency, are expressed as pattern homes, and are used by most of the society members since in those studies with such topics, the authors mainly look for those homes that have some properties in common, such as residential complexes, the homes constructed by an architect, the homes constructed for low-income class (minimum housing), Mehr Housing, and homes built within a short-term time. Therefore, the process of evolution within a long-term interval is required, which is closer to real life. The purpose of this study is to understand the incompatible aspects and incompatibility rate of these aspects of a home during the home construction over the recent four decades in the middle texture of Kermanshah City based on the relation between the status quo and the desired situation for residents. Also, the importance of this subject appears when the velocity of changes and evolutions is not matched with people's adaptation speed, and their demands and needs. Therefore, architects must be aware of these changes and ready to deal with them before others.

1.1. Questions

- What are incompatible components for residents regarding the architecture of their homes in four recent decades of home construction?
- What are the aspects and extents of harm and how are the reasons creating these incompatibilities for residents in each category of incompatibilities?

1.2. Hypothesis

- All changes and developments in pattern homes of each decade and its constituent components follow a rule that is added to these incompatibilities and has a descending trend based on the initial observations in each decade.
- A major part of incompatibilities has occurred due to the sudden shift from villas to apartments without paying attention to residents' behaviors and needs in real life. It means that this change has been faster than the people's adaptation process with this change.

2. BACKGROUND

A review of the studies conducted on a topic is a method that helps understand an issue to find its reasons, know the theoretical and practical gaps in that scope, and express research novelty. Accordingly, the research background of this field is examined.

Fazeli (2008) investigated the home changes in his birthplace with an anthropologist and a holistic description of this village. He explains that it is not possible to consider the following characteristics of a rural house: not being an economic product, connection with the village, birthplace, and integrated with myths and coexistence with nature, which indicates the modernity of Iranian villages. Ebrahimi and Eslami (2010) have studied Iran's architectural development during the transmission period and globalization, networking, and industrialization of architecture concerning the society's identity. They finally explain and introduce the properties of Iranian

architecture during three periods, including traditional architecture (dynamic, hour time and living based on the traditional criteria), industrial architecture (static space, concurrency, materialism, and industrial life), and network architecture (space of streams, timelessness, materialization, and living in virtual space). Khakpour et al. (2015) examined the typology of houses' changes in the old texture of Rasht City to register the ancient patterns and finally found four main patterns and sub-patterns. Haeri (2016) pointed to the domination of objects over the spatial arrangement of the home and the minor role of space, replacement instead of renovation, examining the home's details instead of its wholeness considering them as factors changing the contemporary architecture of Iran. Zanjani et al. (2011) studied the social aspects of Mehr Housing in Karaj, including education, income, and economic position as factors affecting the individuals' unaffordability to buy houses. Soltanpanah and Hosseini (2012) evaluated the quality of Mehr Housing in Sanandaj. To do this, they used two strategic and operating approaches. Finally, three factors of designer, executor, and housing organization were evaluated in the construction of the project, and the quality project index (QPI) equaled 0.53. Alalhesabi and Korrani (2013) examined the factors affecting housing evolution from the past to the future. They explained that it is possible to take a step towards the future of Iranian housing by identifying the change and evolution process. In this case, factors affecting housing include culture and identity, economy, technology, social relationships, and policy. Bahmani and Ghaedrahmati (2016) examined 285 samples of Mehr Housing in Zanjan based on the qualitative indicators and analyzed this type of housing for low-income classes considering components of proper housing in terms of social (culture, privacy, security), physical (installations, equipment, compatibility, and accessibility), environmental (green space and pollution), and economic (income, cost, and ownership) dimensions. Asefi and Imani (2016) obtained the desired Iranian-Islamic housing design patterns by evaluating the quality of traditional homes. In this way, five qualitative indicators were determined for housing: human needs, environmental, physical, functional, and structural quality, and each index was evaluated compared to other indicators. Khaqanpor and Khoei (2017) studied the relationship between the past and the present in some contemporary residential architecture in Tehran. For this purpose, four examples were described based on internal criticism. Geometry, orientation, spatial arrangement, and indoor-outdoor connection are some criticisms considered in this study. In this lieu, some indicators such as human needs, environmental quality, physical-spatial quality, functional quality, and structural quality were identified as the main indicators. Shokouhi Bidhendi et al. (2018) studied the pathology of the Mehr Housing Project based on the residence indigenous model in Bandar Khamir. Their results show that Mehr Housing has been ignored in terms of location, urban development process, climate context, economic equilibrium and competitiveness in development, urban identity, and social cohesion, so this case has been criticized. Rastjoo and Bemanian (2020) studied the typology of spatial structure in homes for four decades in Tehran City. This study was conducted to find the spatial connection between home and culture. In this way, indicators validating spatial structure were obtained from six experts, so that privacy and hierarchy were introduced as two underlying elements of this case. Maroufi and Yeganeh (2021) discovered various factors in the spatial behavior of traditional homes in Meybod City. social aspects, selected activities, and social layers play a direct role in this correlation. Bakhtiary Manesh and Bemanian (2023) assessed the semi-open spaces in contemporary houses of Kermanshah and compared them with semi-open spaces in Islamic-Iranian architecture. The change in privacy and view, area and proportions, protection, multifunctionality and flexibility, light control, heat and ventilation, belonging, and attachment are the main developed factors causing a decline in the use of and interest in these spaces.

3. THEORETICAL FOUNDATIONS

Many studies have been conducted on the architecture of homes worldwide, and many of them are rooted in a lack of home architecture response to all life aspects during the modern period and inattention to human needs in housing design in the 1960s and 1970 leading to low quality of life and dissatisfaction of individuals (Bitaraf, Habib, and Zabihi 2018, 333) that imply some incompatibilities in the architecture of the home. Martin Heidegger believes that residence is the outcome of thinking and building, so residence is not realized if these two factors are not integrated. He expresses that the center of existence is manifested in the home. Therefore, the modern concept of home is rootless in the viewpoint of Heidegger unless it is linked to its profound concepts and actual roots (Aghalatifi and Hojjat 2019, 42), and means original thinking that is required to reveal the object as a collector to achieve a place (living space) in the architecture (Norberg-Shultz 2016, 66). In the opinion of Relph, Heidegger cites that home has lost its meaning in the modern era (Relph 2018, 53). Firstly, Nylander explains that most residents in some residential areas found some issues in their residential area caused by overconcentration on functional properties of architecture. These were qualities that could be quantified and analyzed statistically but residents were their main source (Nylander 2011, 10). He emphasizes that it is possible now to see the effects of residential areas where quantity has diminished the qualitative properties and unpleasant feelings of

residents living in apartments that one can hardly feel comfort in them (Nylander 2011, 10). David Seamon criticized the status quo in study on architecture of home, and emphasizes the importance of human experiences of residents. He explains why a place becomes important for people and how architecture and design can create such environments (Seamon 2000, 157). From the viewpoint of Christin Norberg-Shultz, the current status of the residence does not provide the required quality in a religious tradition outside of it (Norberg-Shultz 2019, 20), which indicates some issues in the architecture of the home. Accordingly, those studies conducted on home details are reviewed to find the criteria and sub-criteria of home in the opinion of researchers. These criteria are then tested by the residents (Table 1).

Table 1. Understanding the Home Components by referring to Research Background

Home Dimensions	Effective Component	Sub- Criteria	Refrences
Inside Home	Hierarchy of Spatial Organization	Access, View, Light	(Ghafourian, Peysokhan, and Hesari 2017; Golpaygani and Einifar 2007)
		Row, Central and Coreal Layout, Arrangement of Spaces Next to each Other, Engineering Organization Criteria, Abstract Maps (Gamma), how to Connect Spaces and Adjacencies, Circulation, Axes	(Mohajer Milani and Einifar 2020; Hamzehnejad and Radmehr 2017; Bagheri, Dashti, and Hojjat 2015; Fathbaqali, Maghsoudi, and Hedayati 2021)
	Function and Furniture	Personalization, Arrangement, Personal Identity, Flexibility	(Okhovat, Ghasemi, and Beheshtaeini 2018; Mehri Ghahfarokhi 2020; Einifar 2003; Darbandi 2013; Afshari and Pourdeihimi 2015; Darbandi 2016)
	Sense of Belonging	Shelter, Identity, Culture, Familiarity, Interest	(Bemanian, Gholami, and Rahmat Panah 2010; Noghre Kar 2008; Aliabadi 2001)
	Shape, Form, Propertions and Quantities	Single Function Rooms, Remaining Spaces	(Mohajer Milani and Einifar 2020)
		Number and Size of Spaces	(Lee 2003)
	Materials and Details	Smart Materials, New Materials, Sustainability, Technology	(Gorji Mahlabani and Haj Abotalebi 2010; Kardgaran and Khalil Khalili 2016)
Outside Home	Open Spaces- Semi Open Spaces and Green Places	Porches, Balcony, Terrace, Sleeping Spring, Moonlight, Portico	(Mahmoudi 2005)
		Yard, Roof, Trees, Garden, Full and Empty Patterns, Height	(Mazaheri, Dezhdar, and Mousavi 2018; Einifar and Ghazizadeh 2011; Rahmani, Nouraee, and Shekarforush 2011)
	Neighborhoods	Common Spaces, Public Spaces, Communication, Sight, Sound, Access, Knowledge, Trust, Culture	(Bastani 1990; Gharekhani, Dezhdar, and Jalalian 2019; Kashfi, Hosseini, and Norouzian 2013; Mahmoodi and Mansourpour 2017)
Internal and External Communication	Light and Daylight	Intensity, Amount, Direction, Psychological and Spiritual Role, Color, Window, Dimensions, Grid, Shadow, Ratio with the Sky and Open Space, Interference, Control, Depth of Spaces	(Tahbaz, Jalilian, and Mousavi 2012; Arjmandi 2011; Tahbaz, Jalilian, and Mousavi 2016; Shokouhfar 2019; Tahbaz, Jalilian, and Mousavi 2012)
	Protection	Security, Safety, Control, Access	(Arzani, Marashi, and Babaie 2020; Sajjadzadeh, Saeid Izadi, and Haghi 2017; Motalebi 2016; Rezaei Moghadam, Hassan, and Yousefpur 2012)
	Privacy and Confinement	Territory, Seeing and Being Seen, Access, Privacy	(Einifar and Aghalatifi 2011, Dusti 2018; Khan Ahmadi and Zeinal Zadeh 2014; Seifian and Mahmoudi 2007; Babazadeh, Toofan, and Jamali 2020)
	Natural Ventilation	Interface Spaces, Window, Opening, Ceiling, Height, Orientation	(Hedayatian 2015; Khajavi, Farokhzad, and Hosseini 2020; Esmaili 2016)
	Vision	Inside and Outside, Privacy, Nature, Semi, Open Spaces, Window, Sky	(Einifar and Aliniay 2014)

According to Table 1, 12 components affecting the architecture of the home, residents, and their lifestyle have been extracted. These components are obtained based on the measurability done by residents that must be evaluated by them.

4. METHOD

This is a mixed quantitative-qualitative study in terms of nature, and the data collecting method is based on the questionnaire in the field research. Data analysis in the quantitative part is done through SPSS software. The constituent variables of the home were obtained based on the library studies and background studies conducted by other researchers to assess these components in the real world and compare them with other effective components. In this case, the dependent variable is assessed as latent variable title dissatisfaction with various aspects of the home and the incompatibility rate of these aspects with the mental ideals of the residents within various decades based on personal, social, and economic properties. Descriptive statistic methods, including frequency, mean, and standard deviations were used to describe data. In addition to inferential statistics, one-sample t-tests, independent T-groups, linear regression, and variance are used to examine the accuracy of hypotheses, compare mean values of research variables at levels of demographic variables, and answer the research questions. Also, the significance level (SIG) of each component in proportion to its mean value indicates residents' compatibility with their homes. Since more than two independent variables exist in the research, Pearson correlation tests could not be used. Therefore, a one-sample t-test was measured based on the mean value of answers in the first step, and then the relationship between components was examined in the t-test of independent groups. Ultimately, constituent components of the home in different decades will be revealed and incompatible components of them will be indicated (Fig. 1). In the qualitative part, among 273 participants, 36 members were selected randomly to express the reason for which, they selected the considered item. These reasons were gathered until they reached theoretical saturation and were analyzed based on logical reasoning.

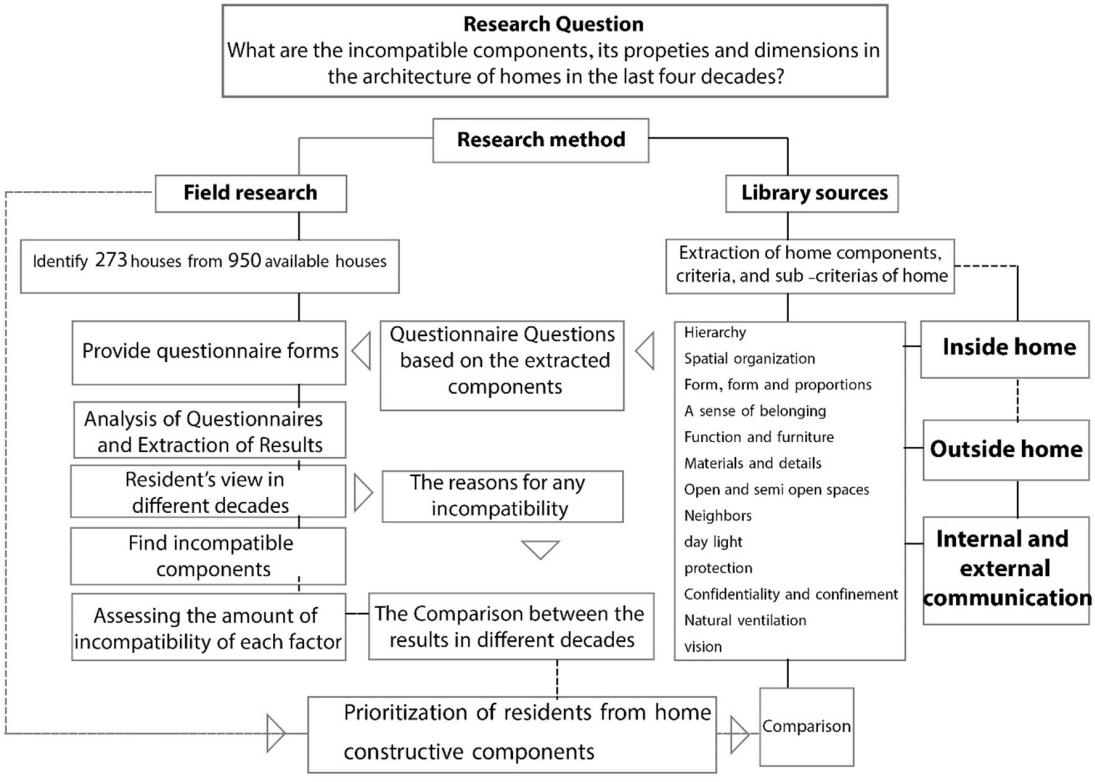


Fig. 1. Research Process

5. CONDUCTING FIELD STUDIES, INTRODUCING THE CASE STUDY

The statistical society in the middle texture of Kermanshah comprised 950 families of which, 273 members (one member per family) were chosen as the sample size based on the Cochrane formula, and the questions were asked from them. the questions were classified into three general scopes, including personal characteristics, properties of the home where they live, and properties of residents'

desired home. In the case of home properties, the questions were categorized into 11 subsets. Finally, two main questions were asked from residents to assess the importance of home. These questions will be expressed in the following parts. To discover maximum incompatibilities, all age ranges and various homes were used. Therefore, residents older than 20 were asked in six groups with 10-year and 4-year intervals of homes from 1981 to 2021.

The questionnaire included 72 questions, and items were scored based on a five-point Likert scale. These questions were defined within some groups and subgroups based on the research background of home components. This process has been done in the first step to review the view of theorists, while has been done in the second step to find the value and relationship between each aspect and home concept in the mind of residents by comparing the place where they live and their desired homes. Ultimately, the evaluation of the status quo of the home is expressed in different generations and homes during various decades. The validity of the questionnaire is confirmed by the statistical experts. Moreover, Cronbach's alpha coefficient[1] was measured to examine the reliability of questionnaires, which equaled 0.8911 indicating the reliability and validity of questions. First, frequency tables and diagrams of each respondent group were designed based on the personal characteristics and initial properties of the homes (Fig. 2). Of these 273 members, 146 members (53.5%) were women and 127 members (46.5%) were men. Moreover, 82 members (30%) were single and 191 members (70%) were married (Fig. 2).

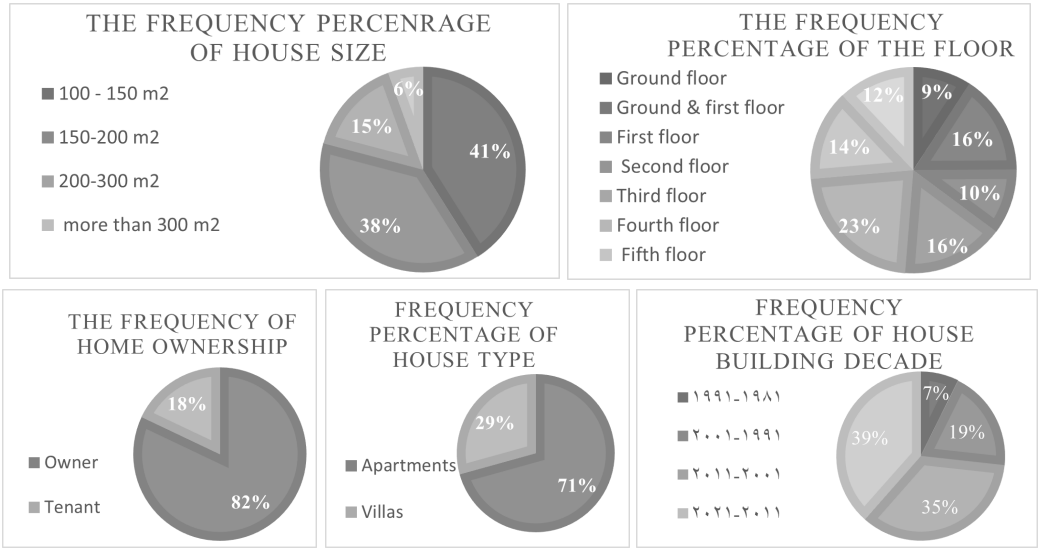
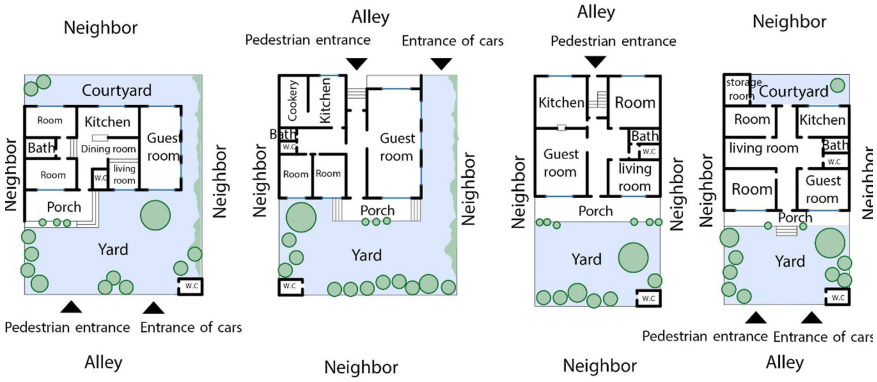
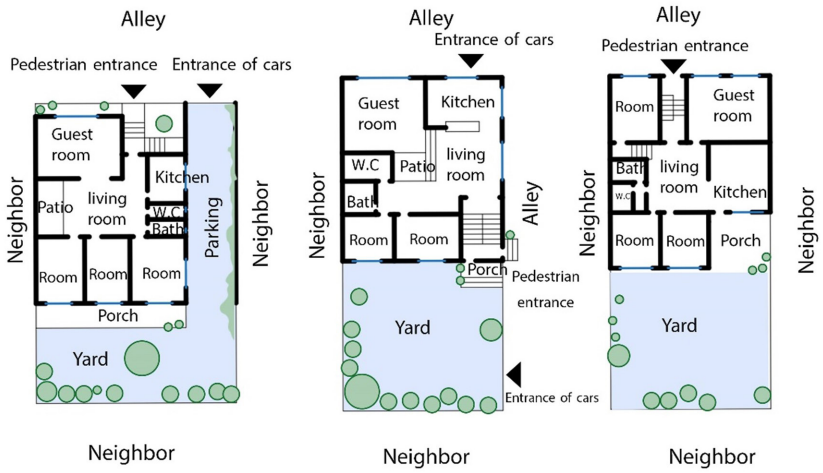


Fig 2. Frequency Diagrams of Initial Properties of Homes based on the Respondents

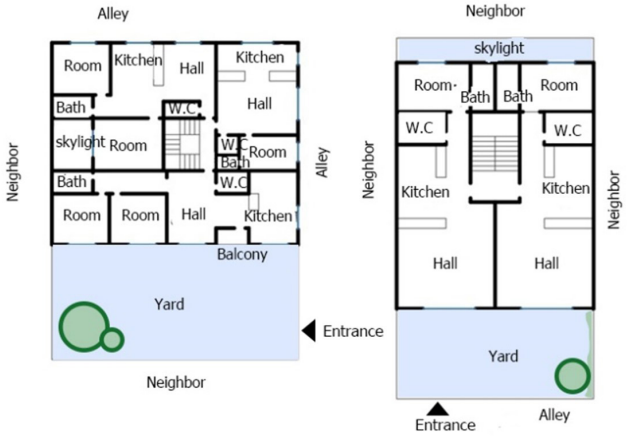
Each component is then examined and separated concerning its constituent variables, and then its effect and interaction with other components are addressed regarding the residents' views. It is worth noting that these elements are investigated based on the home preferences of residents in the spaces of bedroom, sitting room, kitchen, and open or semi-open space if exist. Also, the plan typology of pattern homes has been adopted based on the highest frequency in each decade of home construction by the authors, as depicted in Figure 3.



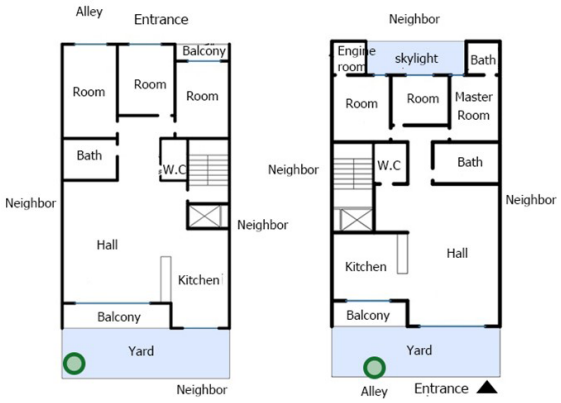
A) Four types of home patterns with the highest frequency among 19 homes built during 1981-1991. Villas



B) Three types of home patterns with the highest frequency among 52 homes built during 1991-2001. Villas



C) Two types of home patterns with the highest frequency among 95 homes built during 2001-2011. Apartments



D) Two types of home patterns with the highest frequency among 105 homes built during 2011-2021. Apartments

Fig. 3. The Pattern of Homes among the 273 Studies Homes during four Decades from 1981 to 2021

6. REVIEW OF RESIDENTS' VIEW ON THE MIDDLE TEXTURE OF KERMANSHAH

Each component was measured in this part based on the comparison between the status quo and desired situation regarding the one-sample t-test and finding the ratio of significance rate (Sig) of each variable to test value, which helps to reveal incompatibility aspects of home and possible harms. It should be noted that the incompatibility rate is measured based on the Likert scale and comparison between the status quo and desired status. Moreover, the obtained values in the 0-1 range mean a very low rate of that parameter, 1-2 indicates a low rate, 2-3 indicates moderates, while 3-4 and 4-5 show high and very high rates, respectively. The variables have been expressed based on the significant relation between them (Sig value must be greater than 0.05).

6.1. Inside the House

The indoor space of the house is where residents can control its access. This space has been addressed in terms of the following aspects: hierarchy and spatial arrangement, function and furniture, shape, form and proportions, materials, details and technology, area, dimensions and quantity, and finally sense of belonging to the house.

6.1.1. Hierarchy and Spatial Arrangement[2]

The access rate of different spaces to each other in the house equals 3.321. This access is higher than the direct connection between two spaces for residents, they consider the view of various spaces in the field of access. In this case, the separation between public and private spaces equals 2.356, and various spatial values equal 2.389 based on the use rate or lack of availability of the whole or area of the room and the importance of available devices in the spaces, which is more than 86% of this factor is seen in homes constructed in the 1980s and 1990s. This means that only 14% of homes related to the 2000s and 2010s have different spatial values. Finally, the acoustic or visual pollution rate equals 2.421. In this case, the interface spaces have been removed and space interference has had the highest incompatibility in homes constructed in the 2000s due to their small sizes. According to research findings, sitting room and kitchen spaces have been separated from bedrooms in many houses, while residents think that private and public hierarchy has not been observed in these houses because of view, sound, private spaces, presence of guests, access to different spaces and location depth are not seen in these houses. Moreover, the diversity of spaces, passing from a space to reach the destination space, closeness or openness of each space for a certain number of members, movement in the house, and routes for seeing individuals are considered in this category.

6.1.2. Function and Furniture

Personal taste-based furniture rate equaled 4.121 followed by the interest in multiple uses of a space (2.963), which means residents are not interested in multiple uses of a place. However, the point in this answer is that when a space is used by one person such as a bedroom, residents are interested in multiple uses of it such as resting and studying. However, these spaces must be separated. The presence of some spaces with multiple uses in homes equals 2.520, and such spaces are more seen in 56% of homes constructed in the 1980s and 1990s. Also, functional change of a space or disappearance of some functions[3] during home-construction developments and the creation of new functions[4] are considered in this category. Home residents consider furniture as a factor for privatizing spaces (making it your own), personal tastes, and a sense of belonging. Residents are interested in multiple uses of a place, while most homes do not provide this opportunity for them, so they indeed are not interested in multiple uses in the current situation (not defining separate spaces or integration of them in a single space). Hence, they consider the broken and multisectoral forms proper for some spaces, such as a bedroom, kitchen, and a little sitting room. The low income and small size of homes are indeed the main issues in dealing with furniture and living place privatization.

6.1.3. Shape, Form, and Proportions

The mean value of the shape and form of the sitting room equals 3.495, shape and form of the kitchen equals 3.432. the openness of the kitchen equals 3.286, the proportions and dimensions of the kitchen equal 3.023, the shape and form of the bedrooms equal 2.860, the proportions and dimensions of the sitting room equal 3.102, and finally, the proportions and size of the bedroom equal 2.765. Accordingly, 74% of open kitchens belonged to apartments and renovated villas, and 26% were closed. In Figure 4, the shapes used for various spaces of home were illustrated and residents were asked to select the current and desired shapes for each space. Therefore, shape 2 and then shape 1 depict the current situation of the kitchen, which residents do not like this form due to its monotony and open view. They then expressed shapes 4 and 3 as desired forms. Unusual forms with many fractures such as U, E, and hexagons were not included in their choices. Hence, residents like a shape pattern that allows doing some activities such as eating and cooking adjacently without interfering with each other and separates or hides the messy parts of the kitchen from the guests' view. This can be achieved with a minimum fracture in the L-shaped forms. However, residents' satisfaction with the size of main spaces in their homes[5] indicates that significant differences exist between individuals' satisfaction with the shape and size of home spaces. Moreover, shape 2 was illustrated as the status quo that is the

best shape in the opinion of most of the respondents based on the obtained values of shape and form of the sitting room. The shape 5 and then the shape 7 were considered by residents. Accordingly[6], a multi-section form of sitting room concerning relevant spaces is more desirable for residents to achieve various functions and semi-private spaces. None of the residents was indeed completely satisfied with the shape of their sitting rooms[7]. In the case of the shape of home rooms. Shape 2 followed by shape 1 in the next rank was considered as status quo. According to residents' opinions, shape 2 which was familiar selected as the most optimal shape, and then shapes 4 and 5 were at the next rank of residents' interest. This implies that residents are interested in rooms with separate parts that are connected properly to do some activities, such as study and rest in a single space. Residents' satisfaction with the size and dimensions of bedroom[8] was moderate (Fig. 4).

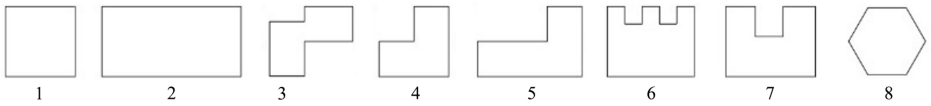


Fig. 4. Shapes reviewed in Different Home Spaces

6.1.4. Materials, Details, and Technology

The interest rate in changing home materials equaled 3.696, the importance of details and elegance in the home components equaled 3.333, the rate of connection between the home façade and its indoor space equaled 2.901, and finally, the quality of materials in studied homes equaled 2.531, which indicate the mean value of residents' dissatisfaction with this component. This issue is at the highest incompatible level in both homes constructed in the 1980s due to worn-out and old materials and in homes built in the 2000s due to low-quality materials. The issue of materials, however, has been improved in homes built in the 2010s. It can be explained that the insufficient income of residents is the main factor in how they deal with materials in the home. Residents consider a direct relationship between the quality of materials and the cost of price of the home purchase. On the other hand, time passage and worn-out materials lead to such incompatibility. Also, interest in using technology at home equaled 4.025, and the rate of its presence equals 1.220 following residents' view. Although the comparison between these two values indicates a high incompatibility in the technology field, this is the nuisance factor for residents' definition of this concept. They consider technology as new electrical facilities that make the tasks easier[9]. Example of such technology includes movable opening and closing windows, frosted glasses, smart lighting, and ventilation systems that can be controlled by a smartphone, automatic home temperature regulator, and so forth that do not exist in the available homes.

6.1.5. Area, Dimensions, and Quantity

In this case, the size and dimension of rooms (bedrooms) varied between 9-15m^2 in 86% of cases and its mean value equaled 3.256. Residents introduced the size of 16m^2 as the best dimension (without considering closets and other spaces), which indicates their need for larger rooms in the home. In the case of rooms' height, 3m has been chosen as the desired value. Also, this rate equals 3.620 for the main sitting spaces, while an average area of 50m^2 has been expressed for the sitting room. The best area for a sitting room is 60m^2 with 4-5m in height. This rate equaled 2.865 for the kitchen. One of the main incompatibilities in this case is indeed seen in the need for larger kitchens with larger and more specified space for putting and arranging the items. Moreover, residents have mentioned 3-4m as the suitable height for the kitchen. This value equals 1.365 for semi-open spaces, which shows the very high incompatibility of the size of such space in the home. Also, the maximum incompatibility has been observed in the apartments built in the 2000s.

6.1.6. Sense of Belonging to Home

The rate of interest in the familiar and associative elements in the new home rather than the experiences in the home equals 3.799, an opportunity for expressing real self in home equals 3.025, consistency between home and family concept equals 3.223, receiving pleasure and happiness from home equals 2.896, home' beauty in mind of residents equals 3.154, home-culture and context consistency equals 2.260, sense of having different home rather than other homes equals 2.762, and finally the match between home where they live and what they imagine equals 1.856. An obvious difference exists between the sense of belonging and its components in the home status quo and the desired condition of the home in the mind of residents, so they mainly have evaluated this aspect at a low or very low level. Ownership type of home has had a considerable effect on the sense of belonging or satisfaction with it. The younger age groups have a lower sense of belonging to home compared to older individuals because they are single children of the family with an unclear living situation (education and job). Those individuals who have uncertain futures have less sense of belonging (at both economic and social levels). Moreover, those who

have lived in a place longer than 7.5 years feel they belong to neighbors, sidewalks, and neighborhood in addition to the homes. In this case, it is seen that those who lived more than 12 years in a place have used to live there forever (Fig. 5).

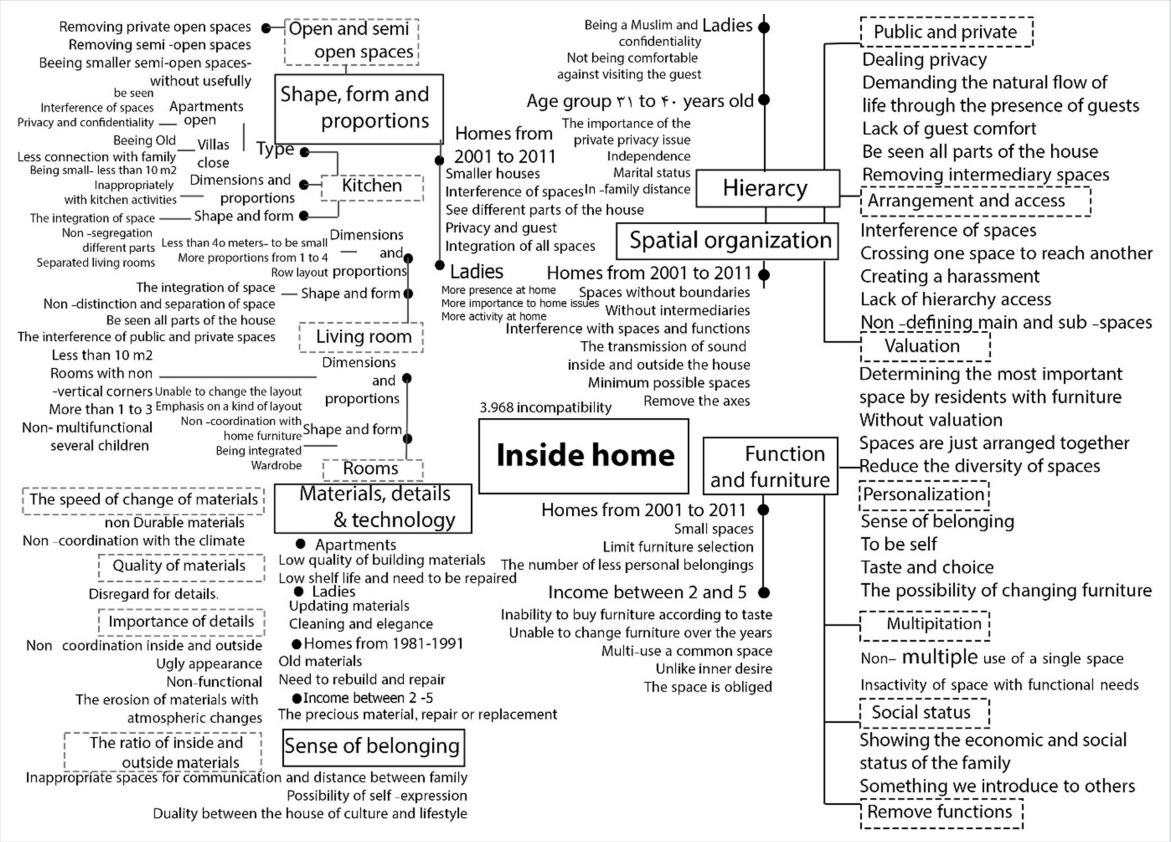


Fig. 5. Incompatibility Factors Regarding Indoor Space of the Home, Individual Components, and their Reasons

In this lieu, residents proposed some strategies to overcome these incompatibilities: putting partitions in front of entrance doors, separating the integrated spaces of sitting rooms using furniture, and carpet, changing the color or materials of walls, separating the dining room for guests from the kitchen or furniture arrangement back to the kitchen space. The incompatibilities have finally led to some harms, such as interference of various functions, interference of the axes and borders of spaces or removal of them, the disappearance of the introduction or a pause when entering a space, acoustic and visual pollutions, increased rate of cases in which family members face each other, passing through space to reach another one. There are also other harms: lower sense of belonging to space, being obliged, following the day mode, comparison with other families, fewer number and diversity of home spaces due to increased interference and stress between family members, shorter residence duration in a home, apparently being a cost-effective home but having high costs of repair and maintenance, erosion, seeing home as a commodity with financial value, downsizing the criteria to the financial profit, larger construction area to achieve higher profit without considering the living space.

6.2. Outside the Home

The space outside the home comprises anything beyond the internal property of the home and is shared with others. This space has been investigated in the following cases: open, semi-open, green, passage, and neighborhood spaces.

6.2.1. Open, Semi-Open, and Green Spaces

In terms of semi-open space, residents define this space as a part of space linking inside and outside with emphasis on the direct connection and access to the indoor space. Also, the rate of access to open space such as a courtyard or roof equals 1.365, while the rate of interest in access to such space without being watched by others equals 4.560. These spaces have mainly remained unused even in villa homes with accessibility to open space due to being watched by neighbors, which indicates very high incompatibility in this field. In addition, the rate of residents' interest in their relationship with green space equals 3.980, while the rate of this connection in reality equals 2.050.

6.2.2. Passage and Neighborhoods

In this case, the possibility of making a relationship with neighbors equals 4.236, while the rate of interest in making a relationship with neighbors equals 1.890. This difference indicates residents' dissatisfaction with and lack of interest in making (visual, acoustic, etc.) relationships with neighbors. The factor of sense of interfering with life privacy is indeed the main factor causing a lack of interest in this relationship, which is an incompatibility factor in apartments with more than one unit on each floor (common walls), and also in apartment units on floors (common staircases, elevators, and parking lots) because individuals do not have any control over this relationship. In the villa homes, however, residents are more interested in this relationship because they own such control (making relationships with neighbors if they want to). Individuals from higher age groups make more relationships with neighbors and show more compatibility because they know neighbors, are less busy, and are interested in interactions and relationships. Duration of stay in a home and familiarity with neighbors play an underlying role in this component; hence, renters have shown higher incompatibility rates. On the other hand, this incompatibility is more seen in younger individuals (less interest in interaction) and older people (lack of interest in interaction). Higher education and occupancy of residents lead to a lack of interest in making relationships with others. Socioeconomic conditions indeed have a direct effect on some components and the remained factors depend on the individual conditions (e.g., body, psych, mind, and memories) of residents. Moreover, the rate of access to passage and status quo equal 1.235 and 1.026, respectively which expresses compatibility between these factors. Residents indeed are not interested in direct connection with and access to passage but are interested in having a passage view and knowing what is going around.

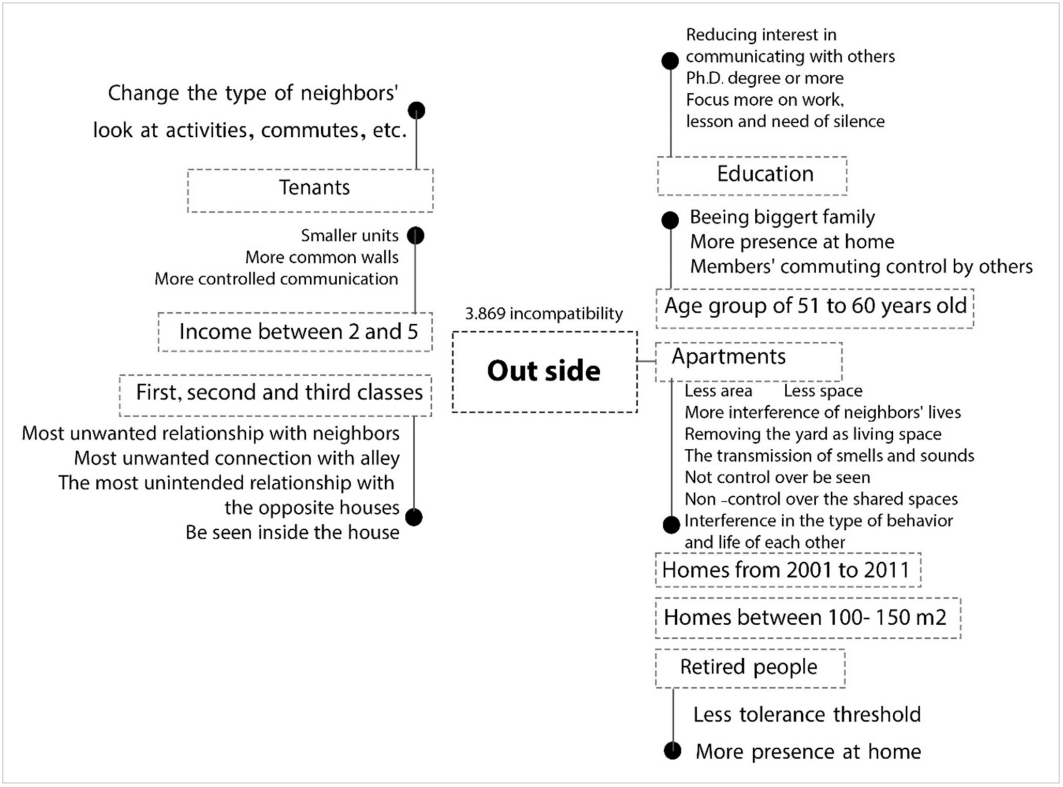


Fig. 6. Incompatibility Factors Concerning Home' Outside, Personal Factors, and their Reasons

In this case, residents have taken some measures to solve their problems: cultivating plants and flowers inside the home, creating various protective layers from passage to home inside, and controlling residents' commutation not to interact with them when going out of the home. Some harms have occurred in this case: loss of privacy, less interest in social interactions, low sense of security, and helping neighbors.

6.3. Indoor-Outdoor Connection

This connection includes all spaces and elements that link inside and outside of the home. This connection may be visual, acoustic, security-based, etc. This issue was investigated in the following cases: light and daylight, view and landscape and semi-open spaces, natural ventilation, privacy and enclosure, and protection.

6.3.1. Light and Daylight

According to a one-sample t-test for this parameter and finding a significant rate of each variable based on the test statistic, the rate of residents' interest in receiving light equals 4.040, while this rate of receiving daylight in homes equals 2.625. Moreover, nuisance caused by daylight equals 3.223, which mainly occurs when objects of the home are destroyed or sunset light glare occurs, and the home temperature rises that can be controlled using a curtain or similar elements. This rate of control average equals 3.425 indicating high daylight control, while not showing change in this control. This control is approximately permanent and does not change at different times. Moreover, the maximum compatibilities are observed in homes that have in-between and interface spaces related to private space, windows covering more than 34% of wall area, and without OKB.

6.3.2. View, Landscape, and Semi-Open Spaces

The rate of interest in semi-open space regarding indoor spaces of homes equals 4.220 but this rate equals 2.368 for semi-open spaces used by residents, and this space exists in villa homes in more than 83% of answers rather than apartments. However, the incompatibility trend has been improved in the apartments built in the 2000s. Also, the rate of interest in the connection between the indoor space of the home and green spaces equals 3.580, which equals 2.820 for the status quo. According to the separation between home spaces, the worse view and landscape equals 1.589 for bedrooms especially in north-facing apartments due to closed skylights, while sitting room space is at next rank with the rate of 2.685. Although the sitting room has the best location in the home with the largest windows, the issues of privacy and closed curtains, as decorative objects, are underlying factors causing a reduction in its view and landscape. Finally, the kitchens with semi-open spaces have the best view and landscape with a mean value of 3.563. It is worth noting that the main issue in the field of view and landscape is seen in the apartments with other apartments built in their fronts, narrowing the view of windows due to low-width passages (8-10m). The best view and landscape in this process are seen in the spaces that are connected to the private open spaces, such as the courtyard because privacy and planation issues have been solved in this case. The rate of this issue is at the maximum level of 4.236 in the homes constructed during the 1980s. Ultimately, the rate of connection with the sky equals 1.365, which is almost lost in all present homes even in the villas that have sky connection due to being watched and controlled by neighboring apartments indicating architectural weakness in this field.

6.3.3. Natural Ventilation

The rate of interest in having fresh air equals 4.105, while the rate of access to fresh air equals 3.755. Also, the rate of controlling air entering the home equals and the rate of temperature control equals 1.569. In more than 78% of studied homes, residents cannot control home temperature in winter or in summer, and being warmer or colder is the single available criterion. Heating and cooling systems in all homes include a radiator and water cooler or gas cooler in some cases, except for some homes built during the 2010s in which, ventilation systems with temperature control, such as Duct Split and Mini Chiller. The main reason for residents' dissatisfaction with the lack of home temperature control in an integrated case is the costs caused by electricity, water, and gas consumption. Change in desired temperature has been seen in higher age groups, while lower heat or cold resilience and tolerance have been observed in this age category. Moreover, those individuals who spend more time at home have more sensitivity to temperature and fresh air. The oldness of the home, heating and cooling systems, and the ratio of window sizes and their types to the home dimension play an effective role in residents' satisfaction. Opening windows to have natural ventilation has created some incompatibilities even in villas, which include entry of insects, being watched and controlled by opposite apartments, windows used in skylight, food's smell, acoustic pollution (noise) of passage, and skylight.

6.3.4. Privacy and Enclosure

The rate of interest in private privacy of individuals equals 4.589, while the rate of met need equals 2.368 expressing a considerable difference between status quo and desired status. Moreover, privatization of home equals 4.122, interest in private spaces equals 3.859, the territoriality of available homes equals 3.758, a home as a shelter equals 3.189, interest in complexity in home spaces equals 3.265, enclosure space of studied homes equals 3.025, and finally privacy of these homes equals 2.226. A considerable point is seen in the definition of enclosure for residents because they mainly consider this concept a negative notion meaning being confined or forced presence in a space, while enclosure means some fences and borders under the control of residents to separate their private life from the public life. Therefore, it seems that home can be a territory under the ownership of the individuals not just their shelter. In addition, construction of apartments in alleys, full view and control over the courtyard of villas that have private open spaces, apartments built in 2000s due to more uncontrolled communication with neighbors, homes with 100-150m area due to deployment of two units in one floor, common walls and noise, homes with more alley-connection, narrow-width alley, being watched by opposite units due to lack of attention to window's location, and disappearance of in-between spaces as inside-outside separating filters are the main factors causing incompatibility.

6.3.5. Protection

This component is measured concerning the ratio of home safety and security as status quo and rate of interest in being protected. In this case, the rate of interest in being protected equals 4.516, security of status quo equals 2.346, and safety equals 3.080. It means that residents have pointed to high and very high codes, which indicate the importance of this component in the formation of the home concept in their minds thinking that "a home is a place that protects you against what exists outside". According to the review of home-construction development in the case of protection, most issues are related to individuals whose jobs make them leave their homes while worrying about their family members (being alone, being sick), children, and theft, or for elderly who live alone. In addition, villa homes, older homes, residents' mindsets formed by less familiarity and relationship with neighbors, new materials, and lower materials' resistance against natural and artificial factors are the main reasons for dissatisfaction with protection, which leads to substantial harm (Fig. 7).

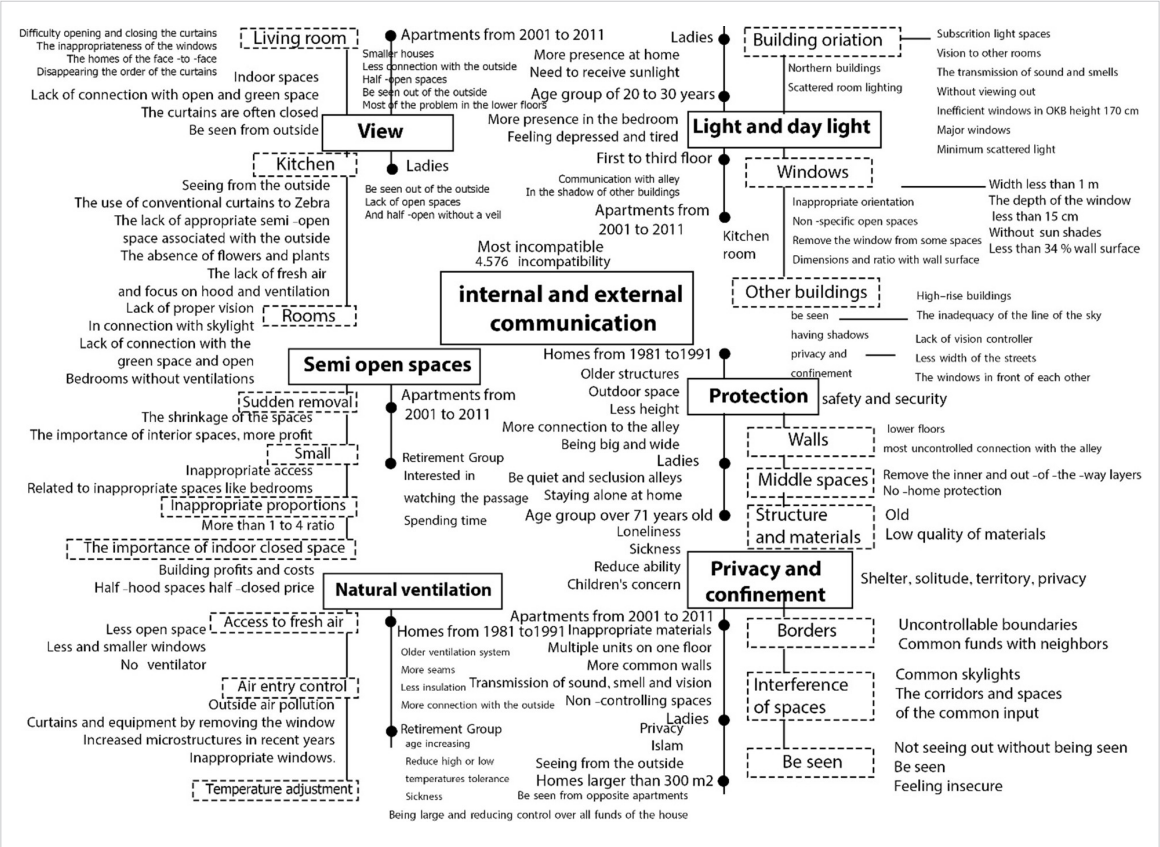


Fig. 7. Incompatibility Factors related to the Home's Indoor-Outdoor Connection, Individual Components, and their Reasons

In this case, residents have proposed some solutions to improve or remove these incompatibilities: installing guards and fences for windows, installing alarms, and CCTV cameras, and increasing entering light and open spaces during the night to provide home protection. Also, residents provide other solutions, such as closing windows to prevent dust and provide security, closing semi-open spaces due to their inappropriateness and adding them to indoor spaces to prevent being watched from outside, closing curtains permanently using them as decorations in the home, using plants inside the house, and limiting home to the indoor space. However, the most critical harm occurred due to the diminished connection between indoor and outdoor space that led to the narrowed indoor space of the home. Other harms include reduction or removal of windows, boring spaces, shorter time of stay in space, emphasis on artificial lights, day and light monotony, watch eyes, reducing passage's security, low importance of what occurs outside the home such as neighbors, neighborhood's cleanness, neighborhood's worn-out, less important of trees and green space, cutting trees when constructing homes, removal of places for mitigating tensions, reducing fresh air, increase energy consumption, loss of water, electricity and gas sources, higher consumption and repair costs, mistrust in what occurs outside the home, and jeopardizing fundamental concepts creating home, such as privacy, private space, and control.

The incompatibility and utility rate of each home

have been measured based on the construction decade regarding the examined variables and shown in Figure 8. This figure indicates the development process of homes over four decades based on the view of 273 residents living in the middle texture of Kermanshah.

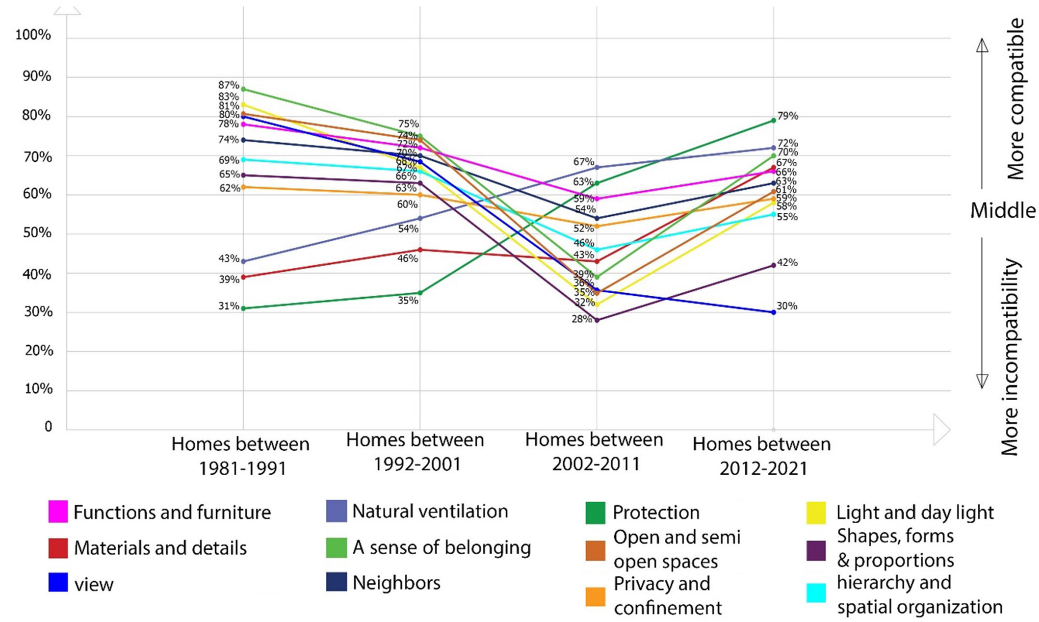


Fig. 8. Compatibility and Incompatibility Rates of Home Architecture Components over four Decades

7. DISCUSSION AND DATA ANALYSIS

The constituent components were obtained according to the questions asked by residents, which are rooted in the studies conducted by researchers. Also, each component had some subgroups that were elaborated in detail.

According to the Friedman ranking test on 273 samples, the Chi-squared statistic equals 1053.223 with a corresponding Sig value less than 0.05 (0.000), which shows the variables' ranking and importance for residents that is as follows:

Daylight value, the value of courtyard and open space, being personal, view and landscape, fresh air, balcony and semi-open space, green space, territory, privacy, pleasure, details, beauty, being different, materials, separation of spaces and geometry, and shape that is in the last rank of this category. In the next step, residents' prioritization of the home's constituent variables from the viewpoint of researchers was measured based on the Friedman Ranking Test its results are expressed herein:

Women	**men**	**Single**	**married**	**Apartments**	**villas**		
Privacy&protection	desirable view	Yard&openspace	personalization	Yard	privady&protection		
20-30	**31-40**	**41-50**	**51-60**	**61-70**	**more than 70**	**Tenant**	**owner**
Privacy	view	personalization	controling	protection	yard	Personalization	daylight
High school	**Diploma**	**Bachelor**	**Master**	**Ph.D. or more**			
Yard- open space	yard- open space	yard- open space	semi open and green	Personalization			
Non income	**less than 2**	**2-5**	**5-10**	**10-15**	**15-20**	**more than 20**	
Personalization	yard-open	yard	yard	daylight	daylight	view	
Employed	**retired**	**self employed**	**unemployed**	**studying**			
Day light	view	yard- open space- green	personalization	controling			
1981-1991	**1991-2001**	**2001-2011**	**2011-2021**	**100-150**	**150-200**	**200-300**	**more than 300**
Protection	personalization	yard- open space	daylight	Daylight	view	view	protection
Ground floor	**ground & first floor**	**first**	**second**	**third**	**fourth**	**fifth**	
Day light- protection	confidentitality	light- view	view	semi open space	semi open space	control	

Family/ being together
protection
Privacy in public spaces
Personalize/be your own privacy
Being true to yourself
Expression of the Emotions
peace of mind
Ratio control
flexibility
diversity
Daylight and fresh air
Good view and scenery
Economic conditions
Social situation

Fig. 9. Residents' Prioritization of Constituent Components of Home

Figure 9 indicates that although among available parameters, residents had some preferences based on their sociological aspects but presented another prioritization in which, economic factors (income, current and living costs), social factors (rituals, social dignity, and what we must show others), and get used to living place played a vital role. The components expressed by residents are indeed associated with holistic studies.

Finally, two key questions were asked of respondents, so that a comparison between their answers and other questions led to considerable results. The first question asked about their desirability and interest in their homes despite the incompatibility in their components of 273 members, 33 residents answered very low (12.5%), 57 members (20%) answered low, 82 members (30%) selected the moderate option, 71 members (26%) answered high, and 30 members (11.5%) selected very low option. Also, the second question asked to what extent they see or describe their homes in the expressed components and details. Of 273 residents, 67 members (24.5%) selected the very low option. 74 members (27%) selected the low option, 96 members (35%) selected the moderate option, 29 members (11%) selected the high option, and 7 members (2.5%) selected the very high.

8. CONCLUSION

The first hypothesis explained that changes and evolutions in the pattern homes of each decade and their constituent components follow a rule indicating based on the initial observations in each decade that these incompatibilities are added with a descending trend. However, the research results in Figure 8 indicate that the first rank of all incompatible aspects does not have a descending trend, while this trend has changed in the 2010s in the second rank so that an attempt has been made to solve the problems that occurred in the peak of incompatibilities that is 2000s. The second hypothesis assumes that a major part of incompatibilities have occurred due to sudden changes from villa homes to apartments without considering the behavior and needs of residents in real life. It means that the velocity of this evolution exceeds the people's adaptation to it. This case is confirmed in the gap that occurred in the homes between the 1990s and 2000s, which is an underlying evolution from living on the horizontal axis to living on the vertical axis.

It also seems that a significant difference exists between the concept of home in the mind of individuals as the desired space and the space where they live as a home. The incompatibility conditions in different components of the home depend on the personal experiences of residents and their socioeconomic conditions, and some similarities and differences exist between these incompatibility factors as some harm from home to residents in different groups.

Moreover, the rule seen in the studied 273 homes indicated the following incompatibility components:

- Creating an integrated and large space without defining life events, and residents' behaviors, and separating them;
- Removing in-between and interface spaces as the introduction and filter for the next space;
- Lack of different valuation of spaces based on importance and access;
- Obligation of spaces in arrangement and lack of furniture change to create diversity and freedom in the home;
- Lack of durability and resistance of materials, and certain times of home construction or being old or going out-of-fashion;
- Being a tenant, lack of residence longer than 7.5 years in a home, lack of relationship with neighbors and neighborhood;
- Lack of control over neighborhood relationships or being watched or heard, light entering rate, fresh air and its temperature, dust, and diseases;
- Lack of desired elements, such as trees, sky, and green space to see outside the home without being watched;
- Reducing diversity in homes and frequency formation instead of having similar patterns;
- Reduction, removal, or inefficiency of semi-open spaces related to private open spaces;
- Being worried about social and economic issues of society causes a greater number of strangers, theft in the neighborhood, and low interest in making relationships with outdoor space.

Home is indeed a single complex because residents assessed some components undesired in some analyzed cases but were not willing to change them since they considered the whole home desired. It can be finally explained that all home-construction evolutions have not been undesired in the middle texture of Kermanshah, and the issues intensified over a decade have been somehow solved in the next decade, while a separate view on each issue has led to another problem in a new aspect. This finding requires scrutinizing and deepening the lives of residents and their demands that provide the field for further studies.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

MORAL APPROVAL

The authors commit to observe all the ethical principles of the publication of the scientific work based on the ethical principles of COPE. In case of any violation of the ethical principles, even after the publication of the article, they give the journal the right to delete the article and follow up on the matter.

PARTICIPATION PERCENTAGE

The authors state that they have directly participated in the stages of conducting research and writing the article.

ENDNOTE

1. Cronbach's alpha coefficient varying between 0.70 and 1 indicates the questions' reliability.
2. Constituent components of each parameter have been obtained based on the theoretical foundations and research background and measured in the sample size.
3. The space of separate sitting rooms, balconies, courtyards, porches, closed kitchens, ceiling skylights, etc.
4. Open kitchens, master rooms with separate restrooms, elevators, etc.
5. 2 percent of residents were strongly dissatisfied with the size of kitchen space, 14 percent were almost dissatisfied, 49 percent had a moderate view on these dimensions, 27 percent were satisfied, and 7 percent were strongly dissatisfied with these dimensions.
6. Without considering the space where residents live and knowing its shape pattern.
7. 5 percent of residents had low satisfaction, 45.5 percent had moderate satisfaction with the shape of their sitting rooms, 44.5 percent of residents were satisfied with the current shape, and the remaining 5 percent were strongly dissatisfied with this shape. In terms of desirability, satisfaction, and or incompatibility factor in sitting room space' dimensions, 4 percent of residents were strongly dissatisfied with these dimensions, 20 percent had low satisfaction, 44 percent had moderate satisfaction, 26 percent were satisfied, and the remaining 6 percent were strongly satisfied.
8. 13 percent of residents were strongly dissatisfied with the size of their bedrooms, 26 percent had less satisfaction, 39 percent had moderate satisfaction, 17 percent were satisfied, and 5 percent were strongly satisfied with the dimensions.
9. The affairs of technology presence that usually exist in life are not indeed considered by residents.

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