

# Evaluation of the Sensemaking Principles from Mashrabiya to Contemporary Balconies Indoor and Outdoor Interaction of Houses in Kermanshah

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## ABSTRACT

Change in lifestyle and living in apartments, gradual removal of courtyards, porches, and semi-open spaces, reduced importance of indoor and outdoor interaction, failure to observe visibility and privacy, lack of attention to human needs for open and green space and its desired effects on occupants have led to inconsistencies in living space of the house. The status of indoor and outdoor interaction of the house is considered with emphasis on semantic aspects of life, the influence of intermediate space on this qualification, evaluation of sensemaking qualities affecting the definition of intermediate space and its improvement considering whether the variation in indoor and outdoor ratio affects these meanings or is influenced by them. This a qualitative study in terms of nature and analytical research in terms of objective. The data is gathered through a combination of written library references and field surveys; first, theorists' criteria about the features of Mashrabiya and its role in the quality of life are considered as initial hypotheses of study then these criteria are tested by going to the houses of residents in Kermanshah to obtain new data. Data analysis is based on the Grounded Theory to describe and analyze the opinions of house occupants. Sixteen samples of balconies in contemporary houses of Kermanshah City were analyzed and compared to the Mashrabiya as functional elements in Islamic civilization and based on the main category of research "sensemaking of life in the house" and some concepts were obtained that included six more abstract categories. Therefore, residents preferred the following elements: "privacy and view control," "protection," "multifunctionality and flexibility," "control light, heat, and ventilation," "3:2 ratios and being right-corner," and "sense of belonging and attachment." Ultimately, this study explained the theory of the relationship between components actualizing semantic quality and sensemaking in intermediate spaces.

**Keywords:** Contemporary Balconies, Mashrabiya, Indoor and Outdoor Interaction, Sensemaking, House.

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## 1. STATEMENT OF THE PROBLEM

If the space is defined as what is surrounded by the human and a set of perceived sequential relationships between surrounding points, these factors can affect the quality of life or be affected by it lonely or under the influence of each other. On the other hand, it is required to identify life flow its meaning, and the environment body of it as elements defining the indoor space and the ratio between these elements and outdoor space to achieve this quality. In this lieu, intermediate spaces are substantial factors as the border between inside and outside of the house because of the gradual elimination of courtyards next to semi-open spaces, porches, belvederes, terraces, and increased apartment life without considering the importance of such spaces in addition to the human need for making a relationship with the nature, outside space, and other people, as well as lack of sufficient time for being in collective green spaces such as parks have led to the construction of almost semi-open spaces called contemporary balconies, terraces, etc. in living spaces created to meet the mentioned needs. The reason is that a house is not a place separated from the outside world. However, inattention to human needs and distorted definitions of intermediate spaces have led to such inefficient spaces in the opinion of occupants. These spaces have led to dissatisfaction of people and incidence of psychological issues for them in terms of inner dimension, and have hurt the city's visual appearance due to its undesirable nature in terms of external dimension. Nevertheless, intermediate spaces have played an effective role over the history in vitality and sensemaking of internal spaces, such as Mashrabiya, porches, Shenashir, and so forth that have been shaped in interaction with living flow inside the living space, and satisfied the need for interaction between inside and outside by consideration of qualitative criteria. Hence, paying attention to intermediate spaces is essential to improve psychological conditions and increase the quality of life in contemporary houses. Therefore, the importance and role of intermediate spaces in improving sensemaking of life are considered as the main objective of the study, while recognition of features of Mashrabiya as the edge connecting insides and outside spaces of the house to create contemporary porches and balconies based on the modern architecture need is set as a secondary goal of the study. Moreover, another objective of the study is to find occupants' needs in intermediate spaces and factors affecting this space use based on their expected meanings. Finally, the ultimate goal of this study is to provide a field for further studies. Accordingly, the following questions have been designed:

1. How do house occupants think about the intermediate space, needs, demands, and semantic qualities of this space?

2. How the variation in the indoor and outdoor space of a house can affect the sensemaking of the intermediate space?

3. How Mashrabiya could meet the qualitative need of the house and affect its sensemaking?

## 2. BACKGROUND

Achieving a desired architecture based on the current needs of the time has been one of the main concerns among architects. On the other hand, intermediate spaces have been addressed due to their importance in the life of occupants and their effects on the inside-outside ratio. These spaces have been examined herein.

In his Ph.D. thesis, Badiee (2002) disambiguates the concept of the wall defining it as a factor that creates privacy and connection is a need for current life as it was in the past, and can improve space perception in creating interconnection and communication between structures. Shah Cheraghi (2003) pointed to another dimension of semi-open spaces, which is transparency. This author explains that indoor and outdoor spaces of a house are interconnected without any border between them in the modern era so that person faces a new space that is not inside nor outside but is both inside and outside. Therefore, we deal with a borderless case consisting of spatial connectivity. Mahmoudi (2005) has studied the porch as a semi-open space in terms of form, concept, and performance, and finally presented some recommendations in the frame of 10 devices for house design in the city of Bam: summer use in northern front of the building, logical ratios and divisions of the porch, personhood, at least two closed aspects, green space view, integrated with building mass, the space for sitting and sleeping, having a place for putting shoes in entrance gate, at least 2-m depth, lack of calculation of porch area as a part of building's infrastructure. Zarkesh (2011) studied the concept of semi-open space by determining the connection between semi-open space and outside creating a sense of semi-openness, which is inspired by a whole consisting of two equal, contrast, and united open and closed scopes of that culture of each society determines its desired position in the openness spectrum. Mirshahzadeh et al. (2011) evaluated space sensemaking by using symbology and the role of boundary-connectivity spaces in Iranian architecture. In this case, they emphasized the role of the porch in the intermediate area of natural and quasi-natural focus that changes the spatial system and makes sense in this change and evolution. Rezakhani (2014) investigated the root of the word "joint" what it is and how is designed. It explains that the joint is the place of connection and separation and organization of architectural integrity. The components of the joint must be changed in their place to get a similar size and reach balance, which are results of research. Einifar and Aliniya Motlagh

(2014) studied contemporary balconies in three residential collections in Tehran. In this research, they introduced the construction speed of apartments as a factor affecting the low attention to intermediate spaces and examine the importance of hierarchy from the entrance gate to the balconies. Finally, secondary and multiple functions in these spaces, the role of the social class of occupants, and communication with adjacent space are factors affecting the quality of intermediate space. Sasani et al. (2016) considered the intermediate space as the factor linking indoor and outdoor areas in the residential complexes of Shiraz. In this case, they achieved some concepts, including privacy, territory, identity, security, and social interaction. The research results indicate that a direct relationship exists between the quality of intermediate spaces and human-environmental qualities. Raheb and Nazari (2017) introduced some factors indicating the higher importance of closed spaces rather than open and semi-open spaces: increased demand for housing, enhanced urbanism, and subsequent higher economic value of the land. The loss of semi-open spaces in contemporary life has jeopardized the mental health of people. Hence, they studied 30 samples of houses in Tehran and introduced lack of privacy and improper space shape as the main factors causing undesired intermediate spaces, and having a view of the surrounding environment was the main factor causing desired intermediate spaces. In a different study, Ranjbar Kermani and Maleki (2017) presented another definition of intermediate space considering it as an ancient pattern for spatial organization in the architecture of the tomb and intermediate booths of the garden. In this study, the intermediate space that shaped the building emphasizing the indoor space was considered as a space in the middle of the building that leads to spatial organization, dynamism, and connectivity in Iranian architecture.

### 3. THEORETICAL FOUNDATIONS

The book "House, culture and Architecture" has pointed to this principle that building construction in Iran architecture has always been shaped based on the combined three patterns of semi-open, open, and closed spaces (Haeri 2009, 117). Therefore, the connection between indoor and outdoor spaces is one of the principles of Iranian architecture (Grutter 2007). Semi-open spaces are indeed inseparable parts of Iranian architecture, which are beyond the promotion, communication between architecture and nature, and various cultural, climate, physical, functional, and psychological aspects (Mahmoudi 2005, 56). Such spaces are not just empty spaces but are essential for the identification of objects and influence the relationship between all elements (Sadynezhad 2016), which are called in some terms, including intermediate space, interface space, middle space, threshold, soft edge, zone, intermediary, border

space, etc. In-between intermediate space creates connection and interaction between indoor and outdoor spaces; this is not a fully private or public space. Yan Gehl resembles living in intermediate spaces to drinking coffee while sitting on the entrance stairs of the house (Gehl 2008). Intermediate spaces are linking and border spaces that can change the natural elements and spatial organization making sense in this evolution (Mirshahzadeh et al. 2011,10). This space can influence both inside and outside of it, so that has an important effect-as a soft edge in communication with outside space- on living in urban spaces where indoor and outdoor lives are interacted (Gehl 2013, 75). These spaces play a role in the general organization of the building in the vicinity of two open and closed spaces serving as independent elements with diverse functions (Mahmoudi 2005, 56). In the opinion of Zarkesh, intermediate spaces are types of architectural places that are defined with a certain size of physical limitations. These limitations are determined by semi-open spaces (Zarkesh 2011, 92). This space has private aspects and borders and is a platform for the life of people to meet their needs and wants (Zarkesh 2011, 92).

#### 3.1. Mashrabiya

The word "Mashrabiya" is derived from "Sharab" which means a place for putting water jugs. On the other hand, it is believed that this word has been introduced by non-Arabs and is the changed form of "Moshrefieh" which means having a view or mastery or a place for watch and see (Mohamed 2015, 3). Many consider this word the synonym of Mashrabiya in Egypt and Saudi Arabia, Roshna in India, and Shanashil or Shanashir in Iraq which have similar functions despite their physical differences (Mohamed 2015, 5). In the opinion of Hasan Fathy, Mashrabiya is the edging space with a brim and latticed opening supported by circular-section columns or fences and mainly has a beautiful and complicated geometrical pattern<sup>1</sup> (Fathy 2018, 69 ). In the book of traditional arts of Mashrabiya, Mohamed defines Mashrabiya as a place for creating private space and protecting people against climate conditions in dry and hot weather. Moreover, Mashrabiya can shade the passage and create a shelter for people walking on the sidewalk (Mohamed 2015, 5).

Mashrabiya has five main functions, and its different patterns require emphasis on one of several of these functions to provide different conditions: (1) control transient light, (2) control airflow, (3) reduce the temperature of the air current, (4) increase the humidity of the air current, and (5) provide privacy. Each Mashrabiya is designed to achieve some or all of these functions (Fathy 2018, 69). Mashrabiya or Shanashir is used as the second shell of the façade that adjusts lights and prevents rapid heat exchange. Moreover, Mashrabiya reduces the temperature of indoor space by shading openings and walls (Hedayat

and Eshrati 2016, 48). In his book "Marsoomeh Al-Emareh Islamiyeh," Yahya Vaziri defines Mashrabiya as a place that creates a space for women to observe street events without being seen. In his book "The Magic of The Mashrabiya," John Feeney points to the shading function and privacy creation of these spaces. He emphasizes that these architectural elements have extracted their function (privacy of family) and appearance (simple geometric motives) from Quran (Feeney 2014).

### 3.2. Contemporary Balconies

In this case, contemporary balconies are considered intermediate spaces of apartments that create visual and functional connections between outdoor spaces, surrounding streets, and indoor space (Einifar and Aliniay Motlagh 2014, 60), and some other functions can be named: storage space for equipment, a place for putting some installations, such as cooler, package, etc. drying clothes, sitting and breathing fresh air, observing landscapes and what happens outside, street commutations, and so forth. In the French encyclopedia, balcony means fence (Parsayar 2009). In the Dekhoda dictionary, the balcony is defined as corbeling of the rooms' front on the second floor. This space is narrow and used as a shade for the lower floor (Dekhoda 1998). In Mehrazi Encyclopedia, the balcony is defined as a porch with a small width. Moreover, the balcony can be defined as a porch on the upper floors of the building (Falahfar and Dehghani 2010). The balcony is a semi-open space that has been unfortunately removed in contemporary houses due to many reasons, such as the high cost of construction, requirements, standards, or limitations of living space.

### 3.3. Inside-Outside Interaction

The term "inside" is the antonym of outside and means indoor space in Dekhoda Dictionary (Dekhoda 1998), while means the middle or inside of a place in Amid and Moeen dictionaries. Indoor space is a private space that is protected against the exit or by its elements (Einifar and Aliniay Motlagh 2014). Therefore, indoor space means being separated from anything that exists outside it (Sadynezhad 2016). In the extant study, indoor space means the core and essence of private living space, what makes the private living space, living is linked to outside and public space through the intermediate space. The term "outside" is the antonym of the inside and means out of something or apparent aspect of it (Dekhoda 1998). Outside space does not include the uncontrolled open space that has a public aspect. This space is considered a source for receiving light, ventilation, view, and landscape in indoor space that is linked to it through the intermediate spaces. In general, balconies or semi-open spaces have shaped through the ratio between two outside (open) and inside (closed) spaces and within the hierarchies between these two

extremes; these ratios can be adjacency, connection, joint, link, and communication<sup>2</sup>.

### 3.4. Sensemaking of the House's Intermediate Space and Its Indicators

In summary, the word sense means the Persian script of meaning in Moeen Dictionary pointing to the concept, purpose truth, and inner meaning. This word is the antonym of term and example. The term "meaning or sense" is defined as the property, result, or quality caused by a source such as behavior or thought in Oxford Dictionary (Oxford 2007, 951). Meaning is mainly the content aspect a phenomenon that completes its formal and apparent aspect. According to this definition, the meaning or sense factor of the environment will be an inseparable part of its life, and the vitality of the life-forming bases in living spaces include social, economic, cultural, and semantic dimensions.

This concept provides some differences and similarities between Islamic and Western civilizations based on the worldview of these two civilizations, which is not considered in the research scope of this paper. However, it is important to express the importance of meaning and its creation in the life of humans; this is the term that Rapoport defines as the contrast between human and non-human spaces (Rapoport 1977). In his opinion, behaviors, interviews, questionnaires, etc. pursue some disciplines and patterns that indicate how people observe and evaluate their surrounding spaces, what they like about them, and what informed behaviors (Rapoport 1969). The descriptive and evaluative elements that are meaningful for people emphasize the effective aspects that evoke the space (Rapoport 2013, 17). However, most designers consider it based on the perceptual words that indicate the distinction between meanings understood by designers and users. The meaning from the viewpoint of the user has been indeed neglected in the studies on the relationship between humans and the environment (Rapoport 2013, 39). Christian Norberg-Schulz assumes that we have reached a point that cannot eliminate the inclusive sense of chaos and turmoil caused by unclear meanings. Loss of place is one of the properties in current conditions (Norberg-Schulz 2012, 35). As Rapoport explains, a clear contrast exists between house and context in the third world and the contemporary era (Rapoport 2013, 136). Therefore, the meaning and sensemaking of living space (house) is a highly substantial issue in the contemporary era. Accordingly, it can be stated that various factors affect the sensemaking of the house with emphasis on the intermediate spaces:

- Physical and environmental factors: visual or physical organization, equality, interaction in open and closed spaces, and physical border structure can be mentioned in this case (Einifar and Aghalatif 2011). Moreover, form, wall, floor and ceiling, materials, opening-to-enclosed space in walls, geometry,

protection of climate factors, and accessibility are considered in this field.

- Social, historical, and cultural factors: the norms available in the society, traditions and rituals, religion, historical background, culture, privacy, ownership, relationships, etc. are the social factors defining and affecting the sensemaking of intermediate space.
- Functional factors: organization of functional territories defines a hierarchy of access, spatial organization, space use, practical communication between adjacent spaces, and connection between inside and outside spaces (Behrouz 2016; Einifar and Aliniay Motlagh 2014, 58; Esmaeili 2020). Moreover,

the multifunctionality of space can also affect its quality (Toloo del and Sadat 2017, 49).

- Perceptual, semantic, perceptual, and cognitive factors: these factors are related to the human perception of living space, land, and sky, visual interactions, proportions, sense of belonging, human scale or separation from it, view and landscape, and spatial identities. These factors are subjective topics (Einifar and Aliniay Motlagh 2014,58; Behrouz 2016; Esmaeili 2020).
- After the viewpoints and comments of theorists were reviewed, some concepts were extracted and reported in Table 1.

**Table 1. Concepts Affecting the Sensemaking of Life in Intermediate Spaces of the House**

Theorist	Sensemaking Factors	Theorist	Sensemaking Factors
Altman (2003)	Social unity	Burke Man (1995)	Borders indicate the relationship between occupants and the outside environment
Alexander (2009)	Territorialism	Levin (1963)	Flexibility and permeability of border limit
Bolnov (1963) (Einifar and Aliniay Motlagh 2014)	The duality between inside and outside space: basis for space perception	Norberg-schulz (2013)	Inside-outside interaction, understanding the meaning of residence
Newman (1972)	Sense of territory	Werner (1985)	Identity and sociability
Donald (2005) (Mac Donald et al. 2005)	Security and care	Jacobs (2017)	Physical diversity, legibility, interactions
Pakzad (2007)	Meeting communicational needs of residents, social interactions, active presence	Golkar (2007)	Flexibility, legibility, permeability, safety and security, livability
Lynch (2015)	Security, compatibility, legibility	Benz (1970)	Defining the relationship between occupants
Lang (2005)	Reducing crime, neighborhood relationships	Gehl (2013)	Security, sense of territory, social relationships
Tavassoli (1997)	Care for residents, social life	Derrida	Both of them, ambiguous
Landry (2000)	Safety and security, physical identity	Posner (1976)	Neither separation nor relationship
Bahreini (1999)	Vitality	Dadpoor (2010)	Security

#### 4. METHOD

This is a qualitative study due to the multidimensional aspect of the considered subject and the effect of various factors on it. This is applied research in terms of objective and is a descriptive-analytical study in terms of the implementation process. The present study was conducted using written sources and theorists' comments on this context, as well as the field survey technique to achieve precious information given by house occupants. Moreover, data analysis was done based on the Grounded Theory because this study aims at describing, interpreting, and analyzing residents' experiences of living in intermediate spaces. This study tries to collect data

based on library studies, field observation, and in-depth interviews with occupants distributing semi-structured questionnaires among them, being present in the space, and find the principles for sensemaking of intermediate space with an emphasis on Mashrabiya to achieve information about theoretical foundations of study. In the first step, library studies were used to extract the following variables: indicators about the intermediate spaces, contemporary balconies, Mashrabiya, and architectural status of these spaces in their sensemaking and its influence on the life of house occupants, parameters affecting this issue from the view of theorists and studies conducted in this case. The quantitative and qualitative indicators collected

through the presence in spaces and interviews with occupants were tested and prioritized in the next step then the new indicators were determined. It is worth noting that the content validity of questions and sub-criteria were obtained through interviews with professors and experts before architecture experts (5 professors of architecture Ph.D. degree) asked occupants questions. The collected data were qualitative and detailed to achieve the main factors of the research questions. The initial data were obtained to identify the main themes through open sampling, which indicated the general properties of the themes and concepts. After that, relational and typological sampling was done to find the extent and dimensions of properties (discover the variability range) that led to the axial coding phase. Finally, sensemaking-oriented theoretical sampling called differential sampling was done to fill the gap in obtained theory, purifying and integrating it, and doing selective coding. This phase

was done to analyze and understand the meaning and nature of the relationship between variables. Moreover, some criteria were added based on the applications, needs, and wants of occupants in intermediate space regarding the contemporary life in the house. The extracted themes are divided into more abstract categories as a class of concepts, which contribute to reaching the theory and finding the relationship between research details.

## 5. FACTORS THAT MAKE SENSE OF LIFE IN MASHRABIYAS

Some concepts and categories were collected through analyzing research background about Mashrabiya, such as the space linking inside and outside spaces, from the viewpoint of architecture experts. Table 2 reports these concepts and categories.

**Table 2. Concepts and Categories about Factors Making Mashrabiya Qualified**

Theme	Main Categories	Sub-Categories	Concepts Pointing to Mashrabiya's Properties	Quality Degree
Architectural	Aesthetics	Form Shape Color	Diversifying living spaces based on the user's needs/observing human scale and ratios by lowering the ceiling and raising the floor in Mashrabiya/enriching the architecture/giving identity to living space/making flexible balance between open and closed spaces/creating details in decorations/using geometrical ornaments/presence of details while constructing a united whole	4.2
	Climate	Light Ventilation Heat	Adjusting the natural light intensity and rate/natural ventilation of environment/preventing rapid heat exchange/reducing energy consumption/directing wind towards inside	4.2
	Materials	Vernacular Materials Consistent with Climate Natural Materials	Changeability and replaceability/available materials/reducing construction costs/being suitable for climate, ecology, and surrounding nature	4
	Security	Being Safe Physical Security	Lower theft possibility/invisibility of house inside/impossibility of passing if it is closed	3.8
	Inside and Outside	Form Function	Flexibility/under the control/components' interconnection/beyond a simple connection, link-like connection	4
Functional	Flexibility	Function Form change	Multiple functions/ability to connect with indoor space/increase the visual area of indoor space/opening the indoor space to outdoor/ability to change from open to semi-open and closed mode	4
	Hierarchy	Access Spatial Functional	Located next to indoor space/passing through open, semi-open, and closed spaces from inside to outside/observing spatial order of functions based on the privacy, presence of a host, routes for commutation of individuals, and respecting the privacy of private space for family/protecting the dignity of private and public spaces	4.2

Theme	Main Categories	Sub-Categories	Concepts Pointing to Mashrabiya's Properties	Quality Degree
Social and Semantic	Privacy	View from	Being joint/observing the outside space outdoors and inside	5
	Social Interactions	Inside to Outside	space indoors/controlling the inside-outside ratio/protecting social relationships between neighbors if required/providing visual communication suitable for user/consistency with religious specifications of society/decorations that narrows the overlooking the inside	
	Religion	View from Outside to Inside		
	Pleasure	Physical-Psychological Comfort- Peace	Control light, airflow, and temperature by the user/creating a platform to sit on it and observe/ability to control inside-outside ratio/creating a space with human scale for interaction/consistent with beliefs of the society	4.2
	Sense of Belonging	Distinction Semantic or Meaning Values	Tendency to return to space/feel missing/doing affairs maximumly/increasing presence and use interconnected with living flow	3.6
Urban	Security	Urban Protection	Providing view from indoor space to urban space/eyes observing the environment	4
	Legibility	Being Prominent Diversity	Better addressing and legibility of streets/finding the location in the city/giving identity/sense of belonging to the urban collection and living space/making building prominent in the surrounding fabric	3.4
	Urban Façade	Materials Color Building Volume/Form	Preventing monotony in the city/creating visual diversity	3.8

According to Table 2, architecture experts believe that Mashrabiya's sensemaking qualities based on the residents and their living type with emphasis on their social aspects are before other main categories. It is worth noting that these data indicate the importance of the urban aspect of intermediate space because most field studies have addressed the role of this space in connection with inside space. The values assigned to all indicators are greater than the average quality indicating a similar response on Mashrabiya's elements to all needs at the right time.

## 6. INVESTIGATION OF INTERMEDIATE SPACES' STATUS

This part of the study introduces the case studies and research field, as well as the four main categories of contemporary balconies in this first step. Each balcony is then evaluated based on the obtained criteria. These criteria have been classified based on the conversations with houses' occupants. Ultimately, eight main properties in each type of balcony are graded based on the qualities of the occupants.

### 6.1. Introduction to Field Research

For field research, Kermanshah and its new fabric were selected as a sample of contemporary architecture and construction processes. The reason is that this city is the living space of the researcher proving a better

identification of the lifestyle of people and making suitable relationships with them; on the other hand, it is essential to do qualitative studies in this area. Among three main areas of life (old, middle, and new fabrics), the new fabric represents the modern construction trend and the main source of inconsistencies concerning the intermediate space. In this lieu and to reach the real results, 16 families (60 members) were selected as representatives of 16 balconies in the frame of 4 main studied categories. The effective aspect considered in the selection of these families was diversity in the contemporary balconies of their houses to achieve the maximum diversity in the inside-outside connection, as well as homogenous education level and average-income social class. It can be stated that 59% were women, 30% were men, and 11% of children live in houses that belonged to selected balconies. All of these respondents were interviewed through the semi-structured questionnaire. The education level of 28 adults was as follows: 3% had diploma and below diploma degrees, 75% had BA degrees, and 22% had MA and higher degrees. It is worth noting that all occupants were chosen from the average-income social class (employees) to reduce the unexpected effects of this intervening factor (economic factor) on the research results. All families had 3-5 members. Moreover, the author spent some hours for non-direct observation through balconies. Accordingly, around 87% of balconies' intermediate space users were

women from the age range of 30-50, which indicates the important role of their needs in defining this space. The considered balconies were selected from 4-8-stories residential complexes (middle) to achieve diversity in the connection between indoor and outdoor spaces within four main categories:

The first group includes open balconies that protrude from its adjacent building connecting to indoor space from one side and outdoor space from three sides. These balconies are connected to sleep space and are towards the north of the building. 1.30m×1.70m.

The second group includes semi-open balconies located in the building and connected to outdoor and indoor spaces from two directions. These balconies are connected to the sitting room and kitchen in the north direction. 1.50m×4m.

The third group includes semi-closed balconies located in the building and connected to the indoor and outdoor spaces from two directions. It is worth noting that one of protruding fronts is semi-enclosed with a lattice. This intermediate space is linked to the dining and sitting rooms in the south direction. 1.40m×2.70m.

The fourth group includes closed balconies located in the building and connected to indoor space from

three directions and outdoor space from one direction. These balconies are located towards the south front and linked to the sitting room. 1.60m×1.40m.

It can be claimed that the indicators identified for Mashrabiya based on the experts' comments, balconies of the second, third, and fourth categories are more similar to Mashrabiya based on their connection pattern with the inside and outside spaces. Moreover, open balconies were selected to find their differences from other balconies, which the distinction is presented herein after investigating the criteria of occupants.

## 6.2. Data Collecting and Analysis

Balconies available in the study were selected based on two main parameters: first, maximum diversity in the inside-outside ratio regarding the available cases; next, the maximum range of sensemaking dimensions and its criteria from the viewpoint of occupants; finally, the common points between them and Mashrabiya in different categories. The authors then asked occupants semi-structured questions. Table 3 reports the descriptive codes presented by them in their ideas in this context.

**Table 3. Codes Obtained from Analyzed Questionnaires Collected from House Occupants**

Factors Affecting the Quality of Life	Descriptive Codes of House's Occupant/Concepts Making Sense of Balcony
Physical Factors	Sufficient area, suitable ratios of different functions, human-centered height, having a ceiling, having shelter without pores or with small pores, preserving climatic factors (wind, rain, snow, snow, pollution, radiation), non-slippery floor, washable materials, the suitable slope for water exit, good access to the balcony, proper connection with indoor space, being adjacent to the kitchen, being adjacent to the sitting room.
Functional Factors	Making barbecue, spreading clothes, washing home appliances, flower work and changing pots, washing vegetables, drying foodstuff, smoking, putting extra devices in the home, putting the cooler, cooking food for religious ceremonies in larger balconies, checking the weather, seeing balcony, finding what occurs in the street, interaction with events, putting a chair and enjoying the open spaces, watching the city, lack of extra devices.
Social Factors	Religion, not being saw from the street, not being saw from front houses, culture, no view of devices and clothes.
Semantic and Meaning Factors	Privacy, the border between private and public spaces, enjoying the space, being connected to indoor space, the possibility to sit next to family members, a sense of belonging, good memories, visiting friends, a layer that is not inside nor outside.

According to reported descriptive codes in Table 3, five main categories can be mentioned about giving meaning to balconies. However, the priorities and descriptions of occupants indicate that their current and expected meanings of the spaces are before other criteria, so it cannot be stated that each described code in categories has contributed to the research objective separately. These categories have been defined herein:

### 6.2.1. Protection

**Security:** the sense of security is a subjective issue depending on a range of personality traits of

individuals to objective properties of the environment (Gehl 2015, 106). Security means reducing the context for offense and crime (Jacobs 2017, 34), and what Jacobs defines as the observer's eyes in the urban space (Jacobs 2017, 34). Need for ensuring the lack of crime in living space is essential, and its initial level means minimizing communication with outside space.

**Safety:** safety looks for protecting the body of individuals against incidences (Gehl 2013, 91). It means being safe against what occurs outside that is risky for humans. The body of the environment can

create a sense of protection by providing safety and security for individuals.

### 6.2.2. Privacy and Transparency

Christopher Alexander explains that around two-thirds of house, occupants are not interested in using balconies that do not provide private life or privacy (Alexander 2009). This privacy is a complicated concept that depends on the culture and its context indicating what data individuals share with others under what conditions (Amini and Nouroozianpour 2014, 101). It means giving the body the space that has privacy within two aspects of meaning and body, so that person can relax in it (Seifian and Mahmoudi 2005, 6).

### 6.2.3. Social Interactions and Life

Social mutual relationship is made to meet human needs for a sense of place and create such conditions to achieve this purpose. Moreover, public activities can improve the personal progress of humans (Lang 2005, 187). Social relationship with individuals is effective in liberalizing people from the psychological pressures of modern life (Toloo del and Sadat 2017, 53). According to Durkheim, a society that has a firm social correlation then its members will follow norms and values more seriously (Durkheim 2008, 62).

### 6.2.4. Pleasure

Pleasant data the environment provides for various senses (Gehl 2013, 187), make all human senses engaged positively, so that experience of the elements

that reflect the life flow, such as scents, sounds, etc. have an effective role in making the environment enjoyable (Jacobs 2017, 37) and (Gehl 2013, 139).

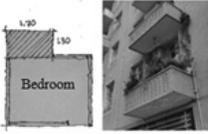
**Comfort:** physical comfort provided for individuals in a space encourages them to stay in that space (Gehl 2013, 15). One of the most important factors affecting the body's comfort is being in a temperature and humidity condition that is tolerable for the human body (Ghiabaklou 2012, 114).

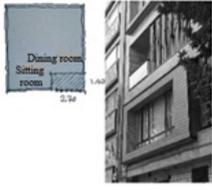
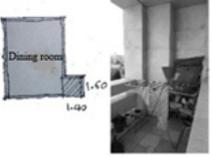
**Peace:** this variable is related to mental conditions and peace of mind. Reaching comfort, and being away from chaos and crowd are factors affecting peace (Oskui and Zadeh Mehdi 2018, 51). Understandability and legibility of space, being related to the natural environment and open space, a physical reflection of people's beliefs and space smoothing would increase the peace of mind of individuals in the space (Nikbakht et al. 2016, 79; Mehdi Zaeh Seraj and Niku Goftar 2011, 41).

### 6.2.5. Sense of Belonging and Identity

A sense of belonging will be created between people and their living spaces if they have deep knowledge about it and can distinguish it from other environments (Ghotbi 2008, 81). Place identity occurs due to the similarities and differences between a place and other places. As the previous information about space, the mental schemas of humans affect the space quality giving it semantic value and converting it from space to place. Accordingly, Table 4 expresses the rank of main categories in the opinion of occupants.

**Table 4. Qualitative Degree of Different Balconies based on the Analysis of Occupants' Questionnaires Considering Main Categories**

Type of Balcony	Balcony's Plan	Main Categories	Qualitative Degree in the Opinion of Occupants					Mean
			Very Low	Low	Average	High	Very High	
Open, protruded balcony with three open directions (4 families, 15 members) Average: 2.36	 (1.70*1.30)	Protection	3	7	4	1	0	1.86
		Overlooking and privacy	9	4	2	0	0	1.53
		Life and social interactions	1	3	4	6	1	3.20
		Pleasure	2	4	8	1	0	2.53
		Sense of belonging	4	10	1	0	0	1.80
		ratios	0	2	4	8	1	3.53
		Access	1	1	6	7	0	3.26
Semi-open balcony Inside the building Two open directions (4 families, 15 members) Average: 2.61	 (1.70*1.50)	Solving climate issues	5	10	0	0	0	1.66
		Protection	2	2	7	3	1	2.93
		Overlooking and privacy	1	3	8	3	0	2.86
		Life and social interactions	1	3	5	5	1	3.13
		Pleasure	2	3	7	2	1	2.80
		Sense of belonging	0	2	9	3	1	3.2
		ratios	2	8	5	0	0	2.20
Access	2	5	6	2	0	2.53		
Solving climate issues	4	8	2	0	0	1.73		

Type of Balcony	Balcony's Plan	Main Categories	Qualitative Degree in the Opinion of Occupants					Mean
			Very Low	Low	Average	High	Very High	
Semi-open balcony Inside the building One open direction One latticed direction (4 families, 15 members) Average: 3.47	 <p>(2.70*1.40)</p>	Protection	0	0	3	9	3	4
		Overlooking and privacy	0	1	2	8	4	4
		Life and social interactions	1	4	7	2	1	2.86
		Pleasure	0	0	1	11	3	4.13
		Sense of belonging	0	1	3	9	2	3.8
		ratios	0	3	4	7	2	3.26
		Access	0	1	9	3	1	3.06
		Solving climate issues	1	4	3	5	2	3.20
		Protection	0	0	0	12	3	4.2
		Overlooking and privacy	0	1	3	9	2	3.8
Closed balcony Inside the building One open direction (4 families, 15 members) Average: 2.93	 <p>(1.40*1.60)</p>	Life and social interactions	2	4	6	2	1	2.73
		Pleasure	1	8	5	1	0	2.40
		Sense of belonging	3	4	6	2	0	2.46
		ratios	7	6	2	0	0	1.46
		Access	1	6	8	0	0	2.46
		Solving climate issues	0	4	5	6	0	3.13

According to Table 4, 16 balconies were investigated within 4 main categories including 60 members. The results indicated that concepts of semantic qualities in intermediate space included paying attention to religion in the first step and control over affairs and functional flexibility. Moreover, semi-closed spaces with a mean value of 3.47 had the highest vitality, use, and utility among occupants.

### 7. DISCUSSION AND DATA COMPILATION

Some points mentioned by occupants belonged to quality properties of intermediate space sensemaking, which differed based on the individuals' needs, living level, family culture, job, social class, number of family members, and their approach to the concept of house and family. Accordingly, the factors affecting this quality in intermediate space of contemporary balconies are identified and ranked (Fig. 1).

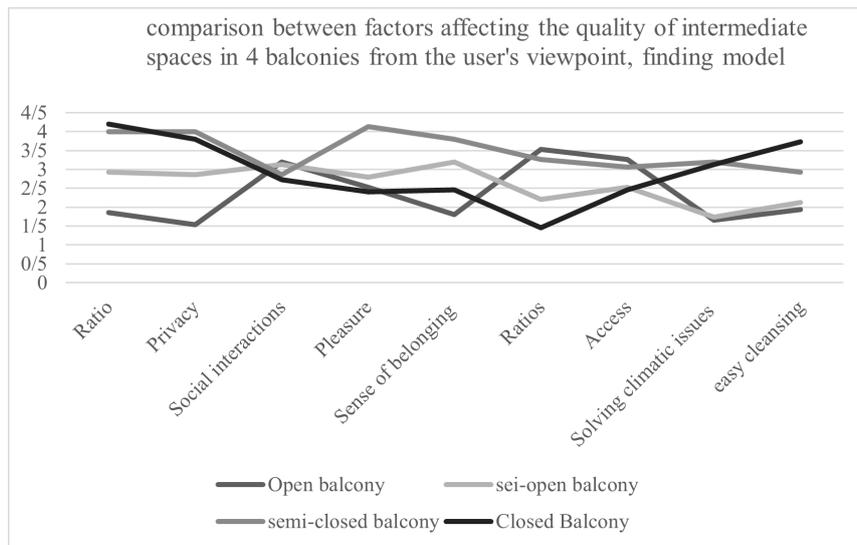


Fig. 1. Comparison between Factors Affecting the Quality of Intermediate Spaces in Studied Samples from the User's Viewpoint

According to the analyzed data and comparison between Mashrabiya and contemporary balconies, occupants assume that the most important factors that give meaning to balconies include the location of balconies inside or outside (open or closed), their tendency towards being semi-closed, and their ability to control this ration and flexible wall that encourages individuals to stay in the balcony. The mentioned cases are highly seen in Mashrabiya. On the other hand, Figure 1 depicts that semi-closed balconies have a greater sensemaking average, while the criteria of semi-open balconies are closer to each other and create a more homogenous space, and open balconies have lower qualities. Moreover, 3:2 ratios can lead to more use diversity and application of spaces, which is closer to the flexibility of Mashrabiya. These ratios indeed have higher utility because they can respond to more functions rather than a rectangular shape with a ratio higher than 1:2.5. This case solves the climatic issues, including control over light, wind, heat, and cold using moving or fixed elements in the aspects related to outside of balcony, but also approaches to the meaning that occupants expect to achieve in such space like Mashrabiya. These two contexts indeed provide the field for achieving security, privacy, overlooking, and social interaction, which lead to the long-term presence of individuals from different age ranges and make memories for them. On the other hand, this case provides security for urban sidewalks due to the observing eyes in the long-term presence of individuals. Furthermore, social interactions and connection with outdoor space are contrary to the privacy and protection needs, while this issue has been a little solved in the balconies that have flexible and semi-open walls because they can control themselves and others in such space. On the other hand, the pleasure rate is directly related to the interest in the space and sense of belonging. Plants and green space, and furniture on the balcony are considered in the next ranks. Therefore, the balcony is considered an outdoor or indoor space based on the spatial body of the balcony, its ratios, and dimensions, as well as its connection with inside or outside and occupants' sense of belonging to it.

## 8. CONCLUSION

On the one hand, change in lifestyle and the necessity of creating intermediate spaces to provide suitable relationships between inside and outside provided the field for this study. On the other hand, this study was conducted due to improper current intermediate space, dissatisfaction with its various aspects, lack of richness in contemporary balconies, and conversion of them to unusable spaces. The extant study was done to achieve the theory of communication between sensemaking factors in the house with an emphasis on contemporary balconies to improve the connection between indoor and outdoor spaces. This theory is

consistent with the needs of occupants in 16 samples of balconies in Kermanshah and its relation with Mashrabiya in a past life or maybe in other climates, cultures, and locations.

According to the results of this study, Mashrabiya is an architectural element with aspects that are related to the house, its occupants, and the city as its surrounding space. These aspects include physical, functional, social, and semantic properties that can separately or collectively affect the sensemaking of intermediate spaces and improve their qualities. In this case, the main index of semantic properties comprises protection, overlooking, privacy and transparency, social interaction and life, sense of belonging, and pleasure, so that integrity between responses to all wants of these aspects made this space valuable leading to cohabitation and growth of its constructive elements. According to the comparison between Mashrabiya and studied balconies and the opinion of experts and occupants, a direct and effective relationship exists between the sensemaking quality of intermediate space and outside-inside interaction with its use and utility rate in this space, which shows the high importance of this space and its effective role in the life of occupants. Therefore, the more interconnected the outdoor and indoor spaces through intermediate space, the higher the utility and use of this space and its effect on the life of individuals. On the other hand, the importance of this sensemaking depends on the space's flexibility and occupants' ability to control its elements.

Finally, it can be stated that semantic factors cannot affect the sensemaking of living space alone regarding the main category of research which is "sensemaking of living in the house;" therefore, these factors have shaped the constructive field for meanings when combined with other factors. It means that physical and functional factors of architecture are conditions required to achieve factors giving meaning to life and all semantic factors are sufficient conditions to get close to the space utility. The prior cases in the design of intermediate space include attention to religion, which comprises "privacy," "certain ratio of private and public spaces," and "ability to control social interactions." "Protecting individuals against what occurs outside" is at the next rank. If the mentioned two cases are achieved, the field will be provided for "pleasure," "using details in decorations," and "human ratios with emphasis on 3:2 ratio" and finally the creation of a "sense of belonging and attachment to space." It should be noted that the "need for social interactions" in most cases is just limited to the view over the outside and individuals are not interested in making this relationship mutually. Ultimately, "flexible" and "multifunctional" spaces with the "ability to control view, light, and ventilation" and "hierarchy of access to intermediate space" are more desired spaces for improving the quality of giving meaning to the life of individuals (Fig. 2). Using

vernacular Iranian architecture based on the current needs and its recognition by identifying the needs of contemporary occupants, change in balcony design

patterns, and improvement of current space is a further objective of this study that requires more research.

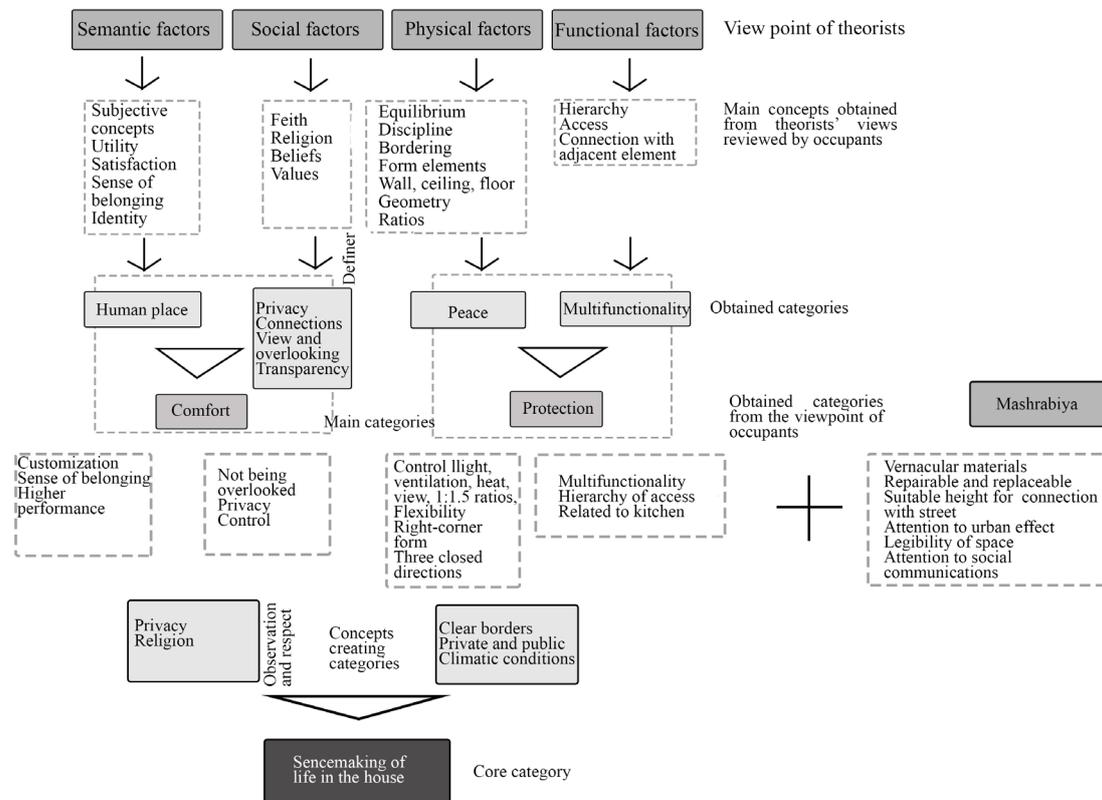


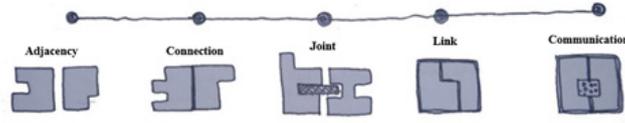
Fig. 2. Theory of Relationship between Components of the Quality of Sensemaking in Intermediate Spaces

## ENDNOTE

1. Seyyed Jafar Hamidi defines Mashrabiya as a low-width wooden balcony installed on upper floors overlooking the passage creating a cool atmosphere far from sunlight and a distance between indoor and outside space (Hamidi 2010, 65). Al-Haidary assumes the wooden balconies on the upper floors of the building overlooking the passage that its height must be tall enough that one camel with its rider could pass under it easily, which a minimum height of its equaled 35m (Al-Haidary 2008, 118).
2. Different types of ratios between inside and outside spaces (Fig. 3)
  - Adjacency: adjacency means two spaces that are in the vicinity of each other. In this case, two spaces are next to each other without any ratio. Such spaces have clear and linear borders and can affect each other; moreover, they do not form any intermediate or interface space.
  - Connection: connection means a co-relationship without any intermediary or a minor one in the world of mathematics (Rezakhani 2014, 107). Two connected spaces have linear intermediate space that plays a minor effect on the quality of these two spaces.
  - Joint: it is a relationship that can link or separate two objects (Rezakhani 2014, 107). A joint or connection point is beyond an ordinary connection that can make sense and organize a whole that exists in it (Rezakhani 2014, 103; Behrouz 2016).
  - Link/continuity: link means the interconnection between two spaces. Such spaces have qualified intermediate

spaces that can affect their adjacent spaces or be influenced by them. Many units appear in the link.

- Communication: the more important point is the status of connectors or intermediate elements. Intermediaries create change to shape communication, so can effectively strengthen or weaken the communication (Rezakhani 2013, 221; Sadynezhad 2016).



**Fig. 3. Grading Intermediate Space from Weak to Strong**

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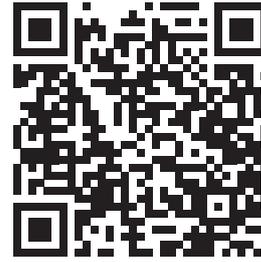
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