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The Components of Preferential Attributes of Residents in the Meaning Structure and Means-End Studies*

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ABSTRACT

The current research aims to identify the housing attributes and the components of each one of these attributes based on the stated preferences of the housing in the meaning structure and means-end methods. Since the attributes are the basis of most of the analytical methods and techniques of the housing preferences, therefore, it will not be possible to achieve the latent meanings and values in the preferences of the residents without recognizing them to provide high-quality housing. To achieve this purpose, first, a list of the studies conducted on the housing preferences, the research method of which had been the meaning structure, and the means-end chain was provided using the systematic review and purposive sampling method. The qualitative information was analyzed using the descriptive method, and then, using the content analysis method, the inferential analysis was explained, providing the purpose-content tables. The presented theoretical approach in the current study provided this opportunity to consider three constituent levels of the conceptual models of the meaning structure (attribute, manifest function- latent function), and means-end chain (attribute-consequence-value) as the attributes of housing in various people. The results showed that the main constituent housing attributes could be divided into seven main groups, including meanings and values, behavior settings system, constituent components and elements of space, physical attributes, function, quality, and affordance. Based on the implemented analysis, the physical characteristics (23.2%), constituent components and elements of space (16.2%), behavior settings system (16.2%), meanings and values (14.1%), quality (12.1%), affordance (10.1%), and function (8.1%), had the maximum and minimum frequencies among the housing attributes, respectively, indicating the relative attraction and importance of most of these attributes for the residents, based on their stated preferences (respondents in the selected studies).

Keywords: Preferences, Attribute, Meaning, Value, Housing.

1. INTRODUCTION

Preferences in housing include fundamental concepts like other discretions of life that can be seen in the various cognitive approaches that seek to discover the qualitative structures hidden in the decision making and selecting process of housing. Various scholars such as Timmermans et al. (1994), Coolen & Hoekstra (2001), Zinas & Jusan (2012), Coolen & Jansen (2012), Coolen (2015, 2011, 2008) stated that the housing preferences had been extensively studied in various and numerous fields as a desired area of a wide range of scientists.

Although there are many ways to extract the housing preferences, these methods are not satisfactory to reach the end purpose of housing, which is recognizing the latent meanings and values in the housing preferences. Most of the produced and presented ways are bias, and their obtained information is too general or inefficient according to the perspectives of planners and designers (Coolen, 2015). However, the meaning structures method is one of the most efficient ways applied using the end-means chain to measure the real and actual dimensions of the preferences of housing users and their attributes and to recognize their latent meanings and values (Jansen, Coolen, & Goetgeluk, 2011). Furthermore, it is noteworthy that these two methods are the basis of many other methods and models used to measure and evaluate the preferences of the users (Zinas & Junsan, 2012).

Since housing is defined by a set of attributes (Jusan & Sulaiman, 2005; Rappaport, 2000); therefore, all the measurement approaches of housing preferences are common in a specific aspect. All of them suppose that housing can be defined, evaluated, and classified by a concept called the attribute. Despite many efforts done in this area of knowledge, there is little knowledge about the nature of the housing attributes (Zinas & Junsan, 2017). The classification process of housing attributes forms a method in which individuals classify their complex environment into meaningful classes (Rosch, 1978). Coolen (2012) believes that individuals divide their environment (such as housing) into smaller units through this classification to deal with them more comfortably. These small units are the indicators of the natural dimensions of the same environment that provide better and effective recognition.

On the other hand, housing is a complex, heterogeneous, and multidimensional process that is associated with many factors of life. Therefore, it is evident that it consists of more phenomena than what is called characteristics through which the residents can discover and understand the meanings of the environment and the involved and effective values (value systems) in the housing. Housing is one of the most significant constituent elements of a residential environment that can be investigated and studied from different aspects. In general, housing, as the main link of an extensive chain (residential unit, neighborhood unit, and neighborhood), has linked the social and private life of the human, thus, one cannot separate these two aspects in housing study. For this reason, many studies emphasize the residential environment than housing (Mahdizadeh, Dashti, & Alishiri, 2016). In this case, a set of phenomena and their interaction can be the desired indicator for housing and its residing process. Therefore, the housing consists of various, different, and heterogeneous attributes, and it is required to study and evaluate its diverse aspects (Jusan & Sulaiman, 2005). Therefore, recognizing the key and influential motivations of the housing users in selecting and preferring a set of housing attributes that lead to these attributes being in the higher preferential priority than other attributes can create a deep insight into the role and significance of housing attributes and their arrangement (Zinas & Jusan, 2012).

Investigating the research background on extracting and identifying the housing attributes in two methods of meaning structures and means-end chain showed that, first, the researchers provide the residents (respondents) with a checklist of housing attributes before starting their research. Then, they obtain a list of the stated preferences of the housing attributes from the residents. After specifying the selected attributes that indicate their relative attraction to other attributes, the next steps of research are implemented. This process can be separated in two ways. The first way includes studies that have not presented a particular classification for the housing attributes and provided the residents with a set of pre-determined physical characteristics (researcher-made). In this case, they do not allow their respondents (residents) to choose the attributes freely. Then, the studies are implemented by the housing attributes that are imposed by the researchers. In this regard, Coolen (2015, 2011) states that the significant aspects of housing attributes might be ignored. The second way includes the studies in which the residents are asked to state their preferential housing attributes. These stated attributes are divided into two general classes of concrete attribute and abstract attribute. The concrete (actual) attributes are defined as the independent and comprehensible physical features and characteristics of a product. The abstract attributes include the relatively intangible (non-physical) features and characteristics such as meanings and values perceived by the housing users. Therefore, a limited set of housing attributes are considered disregarding the housing as a whole unit (Coolen, 2015). That is to say, a wide range of housing attributes might be neglected due to the improper perceptions of residents from many of the conventional concepts of housing and residential environment. It indicates the lack of attention to the qualitative attributes and procedural and functional aspects of housing attributes in extracting the housing preferences.

On the other hand, there are theories that understanding them complicates identifying the housing attributes. Reynolds and Whitlark (1995) paradoxically emphasized that as long as a means can be an end, an

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end can also be a means. In this regard, Coolen et al. (2002) explained that the means are the purposes or products that people select or the activities that they do. Also, the end is the states and valuable qualities of existence, such as values and virtues.

Coolen (2011) believes that what might be a manifest function in the meaning structure for an individual, it might be a latent function for another individual, vice versa. This interactive relationship can be seen in attributes, consequences, and values in the means-end chain method in a way that what an individual considers as consequences or values might be at the level of an attribute for another individual. Also, what an individual knows an attribute might be at the level of consequences and values for another individual.

Thus, it seems that a structured approach is required to identify the housing attributes (as an abstract concept) that includes the concrete and actual attributes at the different levels, including consequences, meanings, and values. In this case, recognizing various factors of housing attributes turns into an approach that considers the functions and different concepts and attributes at three levels (attribute, consequence, values, meanings) from a personal perspective. This new approach is the extensive form of the previous approaches on the recognition of the housing attributes that, in contrast to them, does not focus on a set of limited and physical characteristics of housing. According to this perspective, the housing attributes consist of factors through which the more profound concepts of housing can be explained.

Therefore, recognizing various housing attributes as the basis and foundation of most of the analytical methods and techniques of housing preferences makes the ambiguous and intricate path to achieve the latent values and meanings in the housing preferences easier, reliable, and more functional. The results of applying them in the high-quality housing planning and design processes are used for the end residents.

The following questions are raised to achieve these purposes:
- What are the housing attributes and their components?
- According to the stated preferences, which housing attributes are preferred more by the residents?

Thus, the current research answers to the abovementioned questions based on the systematic review and using qualitative information and descriptive analysis. First, by studying the research background, the difference between the housing preferences and the house selection, and also, the mentioned preferences and the distinction between the stated preferences are addressed. Then, using the research method, sample size, and the process of research implementation are explained. In the selected studies, the current research seeks the considered classifications by the researchers that obtained the housing attributes from the residents before starting the research process. It requires the coding of the analysis units through which the analysis of data is conducted. In the end, the research findings

and results are presented.

2. RESEARCH THEORETICAL FOUNDATIONS

Although the concepts of preference, choice, feature, and attribute are widely used in housing studies, sometimes, these terms are used interchangeably. It indicates that these concepts have a lot in common in terms of content and structure and could not find their actual place in the housing studies. In the following, while studying the distinctive attributes of these concepts, the theoretical framework of meaning structures and means-end chain methods are explained.

2.1. Distinction between Housing Preference and Housing Choice

Jansen et al. (2011) believe that preferences refer to the relative attraction of a thing or phenomenon while the choice is the actual behavior in the concrete world. The preferences, as the manifestation of attraction and expression of fascination, might direct the choice or meet it in the end. What makes the distinction between preferences and choice complicated is the concept that the hypothetical choices, as they can be done in reality, must be considered as the statement of preferences and not a choice. Therefore, if the hypothetical choice is formed in the interest of housing A instead of housing B, it indicates that the preference for housing A is more than housing B. Therefore, the most significant distinction between the housing preferences and housing choice is that the preferences are the limitless evaluation of attraction and fascination. As Gregory et al. (1993) argue, the formation of preferences is more similar to architecture; building a defensible set of values and discovering the values that currently exist.

The cognition and preference structures of residents on the housing attributes are dynamic, intricate, and heterogeneous processes as their choice behaviors that are related to the many factors of life. Preferences and choices are the usual and tangible phenomena of life. Preference can be called a function of choice (Zinas & Jusan, 2012). There are significant stimuli in every preference and choice that provide the people with this opportunity to choose a particular option from other options. The housing preferences (preference and choice behavior of housing) as every choice behavior, is the value-oriented and goal-directed behavior (Zinas & Jusan, 2012; Coolen & Hoekstra, 2001). Therefore, choosing attributes that are significant for a consumer and become a higher preferential priority are determined by their values. Hence, housing can be classified into various classes based on the attributes that become important and based on the attributes that are ignored.

2.2. Distinction between Housing Feature and Housing Attribute

Encyclopedia and dictionaries define the feature as

follows: "feature is a characteristic or property that is not necessarily useful for human" (www.qurora.com). "Feature is a distinctive and prominent characteristic of goods or services that separates it from the similar types" (www.businessdictionary.com). "A typical quality or an important part of something" (dictionary.cambridge.org).

On the other hand, an attribute can be defined as follows: "an attribute is a useful characteristic that its usefulness has been perceived" (Zieba & Gluszak, 2016). "An attribute is a quality or characteristic of a person, place or a thing" (The American Heritage Dictionary, Webster's New World College Dictionary). "Attributes are commonly reflective of the consumers" perspective and their users that can determine their perceived characteristics by a numerical scale such as Likert Scale between two spectrums of very much to very little" (www.businessdictionary.com). Furthermore, the Webster's New World College Dictionary defines the attributes as follows: "A quality or characteristic inherent in or ascribed to someone or something".

Gluszak & Zieba (2016) define the attributes as the visible features of a product. Valette-Florence and Rapacchi (1991) also consider the attributes as the features or aspects of products or services. Gangler et al. (1999) introduce attributes as the relatively actual meanings that show the physical and comprehensible characteristics of a product. According to Botschen et al. (1999), attributes are the characteristics of products, services, or behavior that are preferred or demanded by consumers.

Therefore, the housing features include the characteristics and properties of housing that have the phenomenological form and are universal and comprehensive. These features form the house as a whole unit through which the dimension and adjectives of housing can be determined, and the housing complexities can be reduced.

When the features are useful for the human, and this usefulness is chosen as the perceived affordances, they turn into an attribute. This choice ensures the useful advantages that will bring the desired results for the residents. Therefore, the housing attributes are the housing features that their usefulness is perceived by the human through the mechanisms that relate the individuals and the environment, and they can be called the perceived features of housing (desirable or undesirable). These attributes introduce the housing and the residing process that provide the affordances to meet their residents' needs at various levels of physiological, perceptual, cognitive, semantic, qualitative, evaluations, prioritizations, choices, behaviors, and so on. Also, they introduce the purposes and values of their residents that selected them among the various features of housing.

Therefore, the housing features remain feature when they are investigated by the researchers and are not at the level of attribute yet. These features are provided for the residents in the form of checklists, and they are determined as housing attributes through different methods (such as soft laddering interview, repertory, or Kelly Grid (Kelly, 1955), and so on). Coolen points out that some significant aspects of housing attributes might be neglected or ignored by the researchers and residents in the process of turning from housing features into housing attributes. Hence, the starting point of determining the preferences of each one of the prominent features of housing is the preferential or non-preferential level of those features entitled an attribute. Thus, the attributes are the preferential or non-preferential features of housing.

2.3. Explaining the Theoretical Framework of Meaning Structures and Means-End Methods

In this regard, various researchers discussed the significance of meanings and the values of residents in housing (Moghimi, Jusan, & Mahdinejad., 2017; Hentschke, Formoso, Rocha, & Echeveste, 2014; Jansen, 2014; Kowaltowski & Granja, 2011; Meesters, 2005; Coolen & Hoekstra, 2001). In recent years, there has been a significant increase in the interpretation and application of meanings and values of residents in housing design (Jensen & Maslesa, 2015; Van de Poel, 2013; Edman, 2010; Kujala & Vaananen-Vainio-Mattila, 2009; Flanagan, Howe, & Nissenbaum, 2008; Van den Hoven, 2007; Boztepe, 2007). It is because the recognition of value is a significant factor in a high-quality design for the end residents (Moghimi, Jusan, & Izadpanahi, 2016a).

Accordingly, Cockton (2004) believes that the quality in application and adaptability with the environmental context is not sufficient, and the design must be developed until including the concept of values as the final purpose. The distance between the housing quality and the residents' values must be eliminated to enhance the quality. The elimination of this gap means the interpretation of the quality aspects through the value chain (Schauerte, 2013). It is a chain that begins from the level of housing attributes and continues until reaching the level of latent values and meanings in them. Accordingly, many reasons have been stated in the literature review of 2012 that why the measurement of housing attributes preferences to achieve the values and meanings can be significantly considered by the researchers (Coolen & Jansen, 2012).

By reviewing the literature on this subject, it was indicated that Turner and Fichter (1972) started the discussion on the value of housing. They argued that the contrast and contradictions between the socio-economic and cultural conditions of the individuals from one hand, and the built houses, on the other hand, have led to the emergence of issues in the housing area. Ignoring these values and social aspects have undesirable effects on the housing design, and consequently, the residents (Abbaszadeh, Ibrahim, Baharuddin, & Salim, 2009). After Turner and Fichter, Rokeach (1973) presented his value system (Wong &

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Jusan, 2017). According to Rokeach, the values are divided into two groups of Instrumental values and Terminal values (Rokeach, 1973). Based on the studies of Rokeach (1973) and Yankelovich (1981), Gutman (1982) was the first one who introduced the concept of value by focusing on the deep qualitative understanding of customers' motivations. Accordingly, Raynolds and Gutman (1988) developed the Means-End Chain model (MEC) based on Rokeach's model. This chain consists of three levels: "attributes, consequences, values" (Wong & Jusan, 2017).
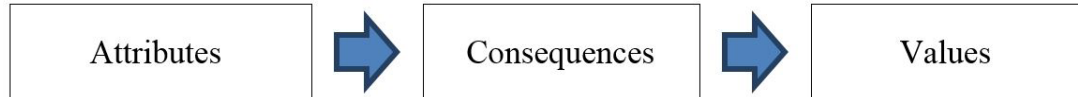

Fig. 1. Variables of Main Structures of MEC
(Gutman, 1982)

Coolen and Hoekstra (2001) developed Gutman's means-end chain and introduced the meaning structure method in housing studies. Then, this method was expanded and developed comprehensively by Coolen (2006, 2008) to measure the meaning of housing preferences and its latent values. The meaning structure method consists of three levels of attributes, manifest functions, and latent functions (Jansen, Coolen, & Goetgeluk, 2011). Finally, Coolen (2015) criticized his meaning structures model and presented a new approach based on affordance.
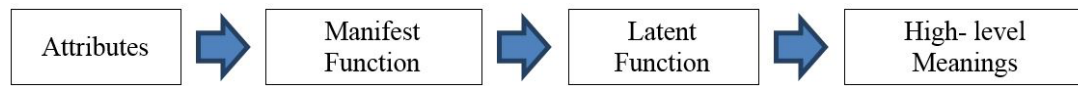

Fig. 2. Variables or Main Structures of the Meaning Structures Model
(Coolen, 2011)

The meaning structures approach is founded based on the means-end chain method. The purpose of the meaning structures method is to determine and identify the housing preferences of people and why they have these preferences. Therefore, this approach reveals the stated housing preferences of individuals and the motivations of these preferences well. The stimuli of the housing preferences of the individuals are used in the interrelated communication networks of purchasing and selling the housing and in achieving the excellence purposes of design and development of residential environments by real estate agencies, designers, builders, and developers (Reynolds & Olson, 2001). Hence, the meaning structures method can be known as a method to measure the stated preferences of housing. This method is non-mathematical and is mainly related to the housing attributes that begins by recognizing a set of preferred attributes of housing. The meaning structures method focuses on the relationship between people and their environments that is a more comprehensive relationship than the relationship between the consumers and goods and emphasizes the significance of meaning in the built environment. The meaning is one of the principal mechanisms in linking the environments and people through the most rational ways in which the environments are built and applied. However, the means-end chain (MEC) provides a way to link the product preference to its share from that product in realizing the purposes and values. The main idea of the means-end model is that the consumers choose some measures that expect them leading to the desired results and minimizing the undesirable consequences. Therefore, values (Values systems) provide the results of the application and use of that product with a negative or positive evaluation.

Hence, the link between values and consequences is of significant importance in the means-end chain model. The second necessary link is between the results and the attributes of products in this model. In other words, people organize and create their values because they are in a position that has the opportunity to choose the purposes and replace the other options, and also can solve the conflicts and incompatibilities of the potential choice. Such a configuration of the values is called a value system (Rokeach, 1973). Therefore, the goods are practical to achieve the results and values in the means-end approach, and the environmental objects are practical in terms of meaning in the meaning structure approach.

The method used to measure and evaluate the latent values and meanings in the stated housing preferences of the residents (according to the studied literature) is relatively the same in both models of meaning structure and means-end chain, and are done in five steps as follows:

1. Extracting the prominent housing attributes (preferential attributes); 2. extracting the preferential levels of prominent housing attributes (prioritization of the preferential attributes and choosing a number of them); 3. implementing the soft laddering interviews; 4. Determining and coding the meaning structure chains using the means-end method; and 5- analyzing data (Hierarchal value maps and conceptual matrix).

The first stage is one of the most principal and fundamental phases of this process. Most of the concerns of experts and specialists are due to the ambiguities in this stage, which have been mentioned in detail. In this phase, the people are required to state their ideal housing attributes limitless (the most significant characteristics and attributes) or choose a

number of them from a pre-determined list of attributes (researcher-made). Therefore, the range of these trans-spatial preferences (they are not related to any specific place of the type of housing) is widespread, the evidence of which can be seen in the selected studies. The purpose of this study is to organize this phase. Therefore, the current study intends to arrange this widespread range and place similar cases in the more macro classes. Presenting this classification provides the researchers with a comprehensive perspective of the housing attributes and their constituent components through which the possibility of ignoring the significant aspects of housing attributes is reduced. It means that in the next phases of both methods, the results obtained from the data analysis are of the higher validity to achieve the value systems or the latent meanings in the attributes and have more efficiency in the decision making processes and residential environments design. Therefore, an appropriate context is provided, in which the adaptability between the mentioned and stated housing preferences increases. Also, in this context, the relocation, main changes in the spaces, and compromising of residents in their housing after residence (tolerating the conditions) will not be seen due to their higher understanding of the satisfaction. The tendency to relocate less over a period and encourage residents to live longer in the same housing is one of the significant goals of community planners and decision-makers that seems to be a more isolated approach to create, design, and build housing requirements due to the recent economic crisis and investment in the world. Thus, in these selected studies, a list of prominent housing attributes preferred by the residents in the first phase (the process of research in these studies) is of significance. Also, following the various alternatives of these preferential attributes in these resources, this classification can be presented based on reliable documents. It is noteworthy that choosing the prominent housing attributes (preferential attributes) in

the first phase is done directly by residents and without applying the researchers' opinions.

2.4. Conceptual Structure of the Revealed Preferences and Stated Preferences

On the other hand, the extensive methodological studies of Timmermans et al. (1994) presented two modeled approach to recognize the origin of preferences and their measurement that include the stated housing preference and choice models and revealed housing choice models. The stated models are based on the observed data from the actual choices of the households in the real markets (Coolen & Hoekstra, 2001; Orzechowski, 2004). The purpose of studying the preferences and choices of housing using the stated models is to recognize the nature and power of the relationships that show the possibilities to select the real choice of a particular type of housing in the actual markets through which, understanding the actual behaviors in the housing market significantly increases. According to the conducted studies, these studies are mainly descriptive and address the current status of the residents' housing.

The revealed models are based on the fundamental proven hypotheses that study the choices that will reflect the effect of desires, ideals, expectations, demands, and tendencies of the residents from the housing usefulness and conditions (Orzechowski, 2004; Timmermans, Eric, & van Lily, 1994). In other words, the revealed preferences are definitions of the evaluations of residents from the housing; when a choice is being formed, it might be related to a hypothetical or actual housing. Therefore, the residents might be surprised when they realized that their choices are reflective of their concrete preferences (Coolen, 2015). Thus, the revealed models are used to select the considered (ideal) housing or hypothetical housing (Zinas & Jusan, 2012; Coolen & Hoekstra, 2001).

Table 1. The Main Content of the Revealed and Stated Preferences

The Origin of Preferences	Data Analysis Method	Final Achievement (Final Purpose)	Common Attribute
Preferring various attributes of housing	Values	Based on the research and studies	Revealed preferences
	Worth and price	Based on the concrete choice behaviors in the concrete markets	Stated preferences

As can be seen in Table 1, different data analysis methods in the revealed models can be used to find out the latent meanings and values in the housing preferences.

3. RESEARCH METHOD

In this qualitative research, after determining the main research question, the texts were selected using a purposive sampling method and through the systematic review study. Out of the 1238 research paper, 33 research paper titles were descriptively analyzed in a screening process. In this phase, the content

analysis research method. It is an inferential analysis in an interpretative- critical method. The clarification and meanings of the preferred housing attributes of residents were addressed using this method. Also, by determining the mentioned content as the attribute in every study, they were classified and coded regularly in the content-purpose tables. The coding of the data was done by the authors of the research separately. Then, after the critical analysis, the disputed cases were reformed. The best method for the precise understanding of the considered attributes in the selected studies and releasing from the paradoxical perceptions is implementing the semi-structured

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soft laddering interview with the respondents. Unfortunately, this method was not possible for the authors. Therefore, in some cases, the operational definitions of attributed were referred to, or the test-error method was used. Eventually, the coded data were described quantitatively. It is noteworthy that a wide range of researchers believe that the content analysis is the core analytical method in the means-end studies and its sub-sets (Zinas & Jusan, 2012; Mahmud, 2007; Veludo-de-Oliveira, Ikeda, & Campomar, 2006; Costa, Dekker, & Jongen, 2004; Coolen & Hoekstra, 2001; Gengler & Reynolds, 1995; Reynolds & Gutman, 1988).

Content analysis is a flexible method for analyzing data that is used for the classification of the concepts and meanings in the texts (Ghaedi & Goshani, 2016). Content analysis is a research method that is applied for the regular, quantitative, and object description of the manifest contents of the messages in a text of a set of texts (Zeighami, Bagheri Nesami, Oskoui, & Yadavar Nikavesh, 2008). Text or content refers to all the structures through which a relationship is established (Lombard, Snyder, Duch, & Bracken, 2002). These texts are related to either past or present (irrelevant to the time and place) are analyzed precisely, more regular, and at a higher degree of reliability (Ghaedi & Golshani, 2016).

Therefore, the current study intends to identify the considered classifications in the previous studies of the attributes and their components. The researchers obtained the stated preferences of housing attributes from their respondents (residents) at the beginning of their research process (as it was mentioned, these preferences lack any limitations and indicate the ideals, desires, and relative attraction for the residents). Since the documents of these classifications are in the previous studies, the preferential attributes of housing were identified and organized by searching these studies.

3.1. Systematic Searching Approach

Since there are already the data in the content analysis studies, selecting studies plays a fundamental role in the validity of these studies. As it was mentioned, the particular characteristic of all the investigated studies in this research is the applied methods in them to recognize and measure the residents' preferences, that is meaning structures method or means-end chain method.

The comprehensive and systematic search of the texts was done from March 2017 until July 2018 using keywords related to the research subject and appropriate to the research objectives, including preference, preferences, housing preferences, choice, housing choice processes, the revealed preferences, the stated preferences, the preferences of users, the preferences of residents, the preferences of the final users, expectations, the theories of expectation, housing characteristics, housing attributes, value, value system, the means-end method in housing preferences, and meaning structure method in housing preferences. All the papers and texts (domestic and international) in this study were collected to gain knowledge of the recent information about the research subject through electronic datasets such as Google Scholar and Scientific Information Database. It is noteworthy that the related papers and the papers referred to in every obtained paper were also searched. Furthermore, by using the list of contents and references of these papers, it was tried to add to the range of the subject literature.

3.2. Sample Size and the Method of Selecting Research (Texts Screening Process)

After the electronic search, the number of the obtained papers was 1238 in total (154 domestic articles and 1084 foreign articles) related to the research subject. The sections of the research abstract, theoretical framework, research method, and data analysis and papers' results were studied to remove irrelevant articles. By using a two-stage systematic process presented in Table 2, the following measures were conducted as follows, and eventually, 32+1 papers were analyzed. The added research is related to the new approach of Coolen (2015) about the measurement and evaluation of the housing preferences based on the affordances, which has a more profound perspective on the housing attributes. The main findings appropriate to the research purposes were extracted after this stage.

Table 2. Research Selection Process (Screening Texts) and Sample Size in Each Phase

Stage	Elimination or Selection Criteria of Studies	Removed Studies	Selected Studies
Identification	Specialized research based on keywords, related papers, and references and using the list of contents and references of these papers about the research subject	-	1238
Screening	Lack of access to the English or Persian full text Experimental nature of research The research problem and research in line with the recognition and measurement of the revealed preferences Having a specific conceptual framework	34	1204
Competency for the final choice	About the architecture or housing studies	31	89
	Using meaning structure method and the means-end method	57	32
The selected studies to analyze the research process		1+32	

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4. DISCUSSION AND ANALYSIS

The extracted data from these studies can be classified into two parts:

The first part is a brief introduction (descriptive analysis) of the 33 studied research in this study that their general characteristics based on the publication year, place, and the country where the study was conducted, and the applied research method are presented in Table 3. The second part is coding the analysis units, considering the research objectives and their operational definition. Also, this part includes preparing a list of the considered attributes in the processes of each one of these studies so that by their purposive classification, one could explain and identify the various components of the housing attributes.

4.1. Brief Introduction of the Selected Studies

The general characteristics of 33 selected research are presented in Table 3 based on the publication year, place, and country where the study was conducted. Based on the analysis of the content of this table, it was determined that; 2.21% of articles were published from 2015 onwards (until the beginning of 2018), 4.36% between 2015 and 2010, 2.21% between 2010 and 2005, and 2.21% before 2005, which indicates a significant and increasing growth in this field of housing research in recent years. Also, 12.1% of articles were published in the United States, 42.4% in Europe, 27.3% in Asia (excluding Iran), 6.1% in Africa, 12.1% in Iran, and zero% in Australia (Oceania). Out of 32 investigated articles, 22 papers (66.7%) used the means-end method, nine articles (27.3%) used the meaning structure with the improved method of the means-end. Also, two papers (6%) used the mixed method of meaning structure or the means-end method in their research. In these studies, a significant share is allocated to the means-end method.

Table 3. Content Analysis of the Selected Studies

Research-criteria	A	1	2	3	4	B	1	2	3	4	5	6	C	1	2	3
(Zinas & Jusan, 2017)	X									X				X		
(Moghimi, Jusan, & Mahdinejad, 2017)	X											X		X		
(Wong & Jusan, 2017)	X									X				X		
(Moghimi, Jusan, & Izadpanahi, 2016a)	X											X		X		
(Moghimi, Jusan, Izadpanahi, & Mahdinejad, 2016b)	X											X		X		
(Coolen, 2015)	X							X								X
(Alaraji& Jusan, 2015)	X													X		
(Afshari Hematalikeikha, Coolen,& Pourdeihimi, 2014)	X									X		X		X		
(Hentschke, Formoso, Rocha, & Echeveste, 2014)		X					X							X		
(Schauerte, 2013)		X												X		
(Jansen, 2013)		X						X								X
(Bako & Jusan, 2012a)		X						X			X			X		
(Bako & Jusan, 2012b)		X									X			X		
(Zinas & Jusan, 2012)		X								X				X		
(Asad Poor Zavei & Jusan, 2012)		X								X				X		
(Zachariah & Jusan, 2011)		X								X				X		
(Zinas & Jusan, 2011)		X								X				X		
(Coolen, 2011)		X						X							X	
(Zinas & Jusan, 2010)		X								X				X		
(Meesters, 2009)		X						X							X	
(Coolen, 2008)			X					X							X	
(Coolen, 2007) *			X					X							X	
(Coolen, 2006) *			X					X							X	
(Zwarts & Coolen, 2006)			X					X							X	
(Meesters, 2005)			X					X							X	
(Jusan & Sulaiman, 2005)			X					X						X		

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Research-criteria	A	1	2	3	4	B	1	2	3	4	5	6	C	1	2	3
(Coolen & Ozaki, 2004)				X						X				X		
(Zwarts & Coolen, 2003)					X			X							X	
(Coolen, Boelhouwer, & Van Driel, 2002) *					X			X							X	
(Coolen & Hoekstra, 2001)					X			X						X		
(Reynolds & Olson, 2001)					X		X							X		
(Reynolds & Gutman, 1988)					X		X							X		
(Reynolds & Gutman, 1984)					X		X							X		
Total		7	12	7	7		4	14	0	9	2	4		22	9	2

(A): publishing year; (1) 2015 ≤ year ≤2018; (2) 2010 ≤year ≤ 2015; (3) 2005≤year ≤2010; (4) year ≤2005; (B) Publication Country;
(1) the US; (2) Europe; (3) Australia; (4) Asia Excluding Iran; (5) Africa; (6) Iran; (C) Research Method; (1) means-end method; (2);
meaning structure method or the improved means-end method; (3); mixed method including means-end or meaning structure

4.2. Coding the Analysis Units to Determine the Components and their Operational Definition

The first step to implement coding is to select the analysis unit that can be a simple world or a whole message. The analysis unit is selected according to the title or the type of connection that we want to analyze. In the current study, the analysis units include the terms or words that indicate the preferred housing attributes of the residents in the selected research that are mentioned in the text of the papers. The current study intends to find the housing preference applied in the process of research. Therefore, in analyzing the content of resources, due to their breadth and value and the concern of possible deletion and ignoring of some data, first, a list of housing attributes considered in selected research was prepared. To code these attributes, first, their contents must be explained by particular codes to be measurable and classified in the next phases. In the content analysis, the ideal state is that two or some coders code similar messages separately and independently. In this research, the authors of the paper conducted the coding in two stages on the data of selected studies.

The first phase is the extraction of the housing attributes, and the second phase is the extraction of the components of each one of these attributes. In the coding phase, after critical analysis, the paradoxical cases were investigated and reformed; also, the selection of the final attributes was through the classification of the distinctions and similarities between the criteria, and it was tried the attributes be inclusive and exclusive. Inclusion means that the attributes include all the analysis units. Exclusion implies that each attribute must have the units that distinguish them from other attributes.

Table 4. Considered Housing Attributes in the Selected Studies

Study	Housing Attributes	Component Frequency	Frequency Percentage
(Zinas & Jusan, 2011, 2012, 2017; Wong & Jusan, 2017; Schauerte, 2013; Jansen, 2013; Meesters, 2005, 2009; Coolen, 2006, 2007, 2008; Jusan & Sulaiman, 2005; Coolen & Ozaki, 2004; Zwarts & Coolen, 2003)	Values and Meanings	14	14.1%
(Moghimi, Jusan, & Mahdinejad, 2017; Wong & Jusan, 2017; Alaraji & Jusan, 2015; Hentschke, Formoso, Rocha, & Echeveste, 2014; Asad Poor Zavei & Jusan, 2012; Meesters, 2009; Coolen, 2006, 2007, 2008; Zwarts & Coolen, 2006; Meesters, 2005; Jusan & Sulaiman, 2005; Coolen & Ozaki, 2004; Zwarts & Coolen, 2003; Coolen, Boelhouwer, & Van Driel, 2002; Coolen & Hoekstra, 2001)	Behavior Settings System	16	16.2%
(Moghimi, Jusan, & Mahdinejad, 2017; Wong & Jusan, 2017; Moghimi, Jusan, & Izadpanahi, 2016a; Moghimi, Jusan, Izadpanahi,& Mahdinejad, 2016b; Afshari Hematalikeikha, Coolen, & Pourdeihimi, 2014; Hentschke, Formoso, Rocha, & Echeveste, 2014; Bako & Jusan, 2012a; Asad Poor Zavei & Jusan, 2012; Meesters, 2009; Coolen, 2006, 2007, 2008; Meesters, 2005; Coolen & Ozaki, 2004; Zwarts & Coolen, 2003; Coolen, Boelhouwer, & Van Driel, 2002)	Constituent Components and Elements of Space	16	16.2%

Study	Housing Attributes	Component Frequency	Frequency Percentage
(Zinas & Jusan, 2017; Moghimi, Jusan, & Mahdinejad, 2017; Moghimi, Jusan, & Izadpanahi, 2016a; Moghimi, Jusan, Izadpanahi, & Mahdinejad, 2016b; Afshari Hematalikeikha, Coolen, & Pourdeihimi, 2014; Hentschke, Formoso, Rocha, & Echeveste, 2014; Schauerte, 2013; Jansen, 2013; Bako & Jusan, 2012b; Zinas & Jusan,2011, 2012; Meesters, 2009; Coolen, 2006, 2007, 2008, 2011; Zwarts & Coolen, 2003, 2006; Meesters, 2005; Jusan & Sulaiman, 2005; Coolen& Hoekstra, 2001; Reynolds & Gutman,1984, 1988)	Physical Characteristics	23	23.2%
(Moghimi, Jusan, & Mahdinejad, 2017; Wong & Jusan, 2017; Moghimi, Jusan, & Izadpanahi, 2016a; Moghimi, Jusan, Izadpanahi, & Mahdinejad, 2016b; Coolen, 2006; Zwarts & Coolen, 2006; Jusan& Sulaiman, 2005; Coolen & Ozaki, 2004)	Function	8	8.1%
(Zinas & Jusan, 2012; 2017; Moghimi, Jusan, & Mahdinejad, 2017; Wong & Jusan, 2017; Moghimi, Jusan, & Izadpanahi, 2016a; Moghimi, Jusan, Izadpanahi, & Mahdinejad, 2016b; Schauerte, 2013; Jansen, 2013; Meesters, 2005; Jusan & Sulaiman, 2005; Coolen & Hoekstra, 2001; Reynolds & Gutman, 1988)	Quality	12	12.1%
(Moghimi, Jusan, & Izadpanahi, 2016a; Moghimi, Jusan, Izadpanahi, & Mahdinejad, 2016b; Coolen, 2006; 2008; 2015; Alaraji & Jusan, 2015; Hentschke, Formoso, Rocha, & Echeveste, 2014; Bako & Jusan, 2012a; Zwarts & Coolen, 2006; Coolen & Ozaki, 2004)	Affordance	10	10.1%
Total number of frequency of coded components		99	100%

In this phase, the total number of the coded attributes was 99 and is classified into seven classes. After determining these attributes (the order of attributes in the content-purpose table (4) is without any presumption and random), to create a more clarified attitude to the nature of the attributes and their visible features, the operational definition and explaining each one of these attributes are presented briefly.

4.2.1. Explaining the Meaning and Values Attribute

According to Norberg Schulz (2007), the meaning is the fundamental need of human. Every person is born in a meaning system and understands the meaning system through the symbolic manifestations. The human reveals the meanings by constructing in this system. Every produced product by the human can be considered as a symbol or tool that tries to order particular relations between human and the environment. Human does this through meaning and through which, excels his individual position, and obtains the social and purposive life due to that.

The meaning of the built environment has a fundamental discussion in the aesthetic theories, and there are many levels of meaning and various theoretical approaches to that. According to Chemero (2003) and Coolen (2006), the meaning of housing is the relationship between activities and environment features. According to

Rappaport (2006), the meaning is a mechanism of the relationship between individuals and the environment. Therefore, the meaning of housing is the meaning of activities. Also, it includes the meanings obtained from the interaction between environment features and activities in addition to the meanings of the features. Therefore, housing, as a set of meanings that include three levels of high-level meanings, is considered as the global perspectives and value systems of Zwarts: "middle-level meanings are the values, and low-level meanings are the manifest functions" (Coolen, 2011; Zwarts & Coolen, 2003).

4.2.2. Explaining the Behavior Settings System Attribute

A behavior setting consists of an environment in which a regular and predictable behavior or activity is done. These settings direct the behavior and activities of individuals (Rapaport, 2005). Therefore, the behavior settings system can be considered a system of activities (or behaviors) in an environment (body) that time can play a determining role in its organization. For instance, various behavior settings can occur in a specific space, and different times or various behavior settings can occur simultaneously in a particular space. Furthermore, sometimes the quantitative (numerical) of the similar behavior settings system (such as the number of rooms) can be applied in measurement

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and evaluation of the preferences that are the main emphasis on the interactions between the similar behavior settings in a more macro settlement system.

4.2.3. Explaining the Attribute of the Constituent Elements and Components of Space (Fixed, Semi-Fixed- and Non-Fixed Components)

The simplest and most tangible conceptualization of the environment is to consider that a combination of fixed, semi-fixed, and non-fixed components (Rapaport, 2000). It consists of the components of the physical structure of the built environment. The fixed components include infrastructures, structures, walls, floor, ceilings, columns, openings, and what that is hardly changed. The semi-fixed components include furniture, decorations, and decorative elements, plants, curtains, lighting systems, and acoustic requirements, and alike. The non-fixed elements are humans and animals, activities, and behaviors.

4.2.4. Explaining the Attribute of Physical Characteristics

One of the significant aspects of the housing and residential environment that includes a wide range of concepts is physical characteristics. Physical characteristics are the indicator of other aspects of the constituent elements and components and space and their different and unique characters. Physical characteristics are the physical manifestation of the housing, the most objective and materialistic subject in the evaluations, analysis, and housing planning (Sartippour, 2010). The physical characteristics are a set of systems, regulations, and natural features of each one of the physical constituent elements of the spaces. A united whole is created by the companionship and interaction between these components. This united whole can only have one component or can be made of a non-countable mass of components. It indicates two ranges of upper and lower end of the components that can contribute to understanding the united whole (Grutter, 2014). In this case, the type of components, their organizing system, their natural features, and the adjacency and relationship between them and many other cases will have a significant impact.

Also, space is recognizable through its limiting components and elements, and its character is subject to the ruling order between these components. Therefore, the concepts of limits, boundaries, edges define the areas. They emerge in different scales (micro, medium, and macro), and can (for example) evaluate the placement and spatial location of the residential unit in its context and determine the open spaces, closed spaces, semi-open spaces, internal, external, empty, and so on. On the other hand, the concepts of space perception such as spatial distances, spatial dimensions, space depth, spatial extent, the density of elements in space, spatial openings, spatial obstruction, spatial porosity, and spatial permeability, and so on

are mentioned in addition to the spatial elements, their organization, and combination (layout). Also, besides these cases, the types of spatial organizations include linear, centralized, radial, grid, clustered, the type and housing typology, various types of standards, regulations and their requirements, and neighborhood unit features (Von-Meiss, 2004). In this regard, a particular number of spaces that can be considered as standards in space definition that are a component of the physical characteristics.

4.2.5. Explaining the Function Attribute

The concept of function or functional benefit is one of the principles of architecture, and it means usefulness and benefits in architecture that can be explained in the relationship between the human and its activities that occur in the architectural space (Gharibpour, 2007). The words related to the function can be summarized in four general perceptions of function as follows: Applied interpretation: Use or usefulness means application. It is the application that has the effect of architecture as a functional object on human beings and refers to the ratio between an object and a work that is done for something, someone, or purpose. Mechanical interpretation: being functional means considering the architectural body and its construction process in contrast to its artistic aspect. Systemic interpretation: adaptation with purpose means adapting to what has been considered. Its application in architecture has been considered the proportion of the architectural body with its purpose. Also, the necessity that refers to the adaptation with what must be and have benefits. Its application in architecture is in the proportion of the body with musts, necessities, and what is mandatory for something. Aesthetic interpretation: function means an act of something on something else, and its application in architecture refers to the action of architectural components like a living being (Gharibpour, 2013). Also, most people look for housing that can have many functions (being multifunctional) that can be associated with different meanings for them. The multifunctionality of the spaces provides this opportunity to increase the activities and behaviors that occur in space. Hence, the method and type of design (internal and external) is of significance. The most significant housing functions are as follows: shelter, privacy, safety, control and prevention, social status, and so on.

4.2.6. Explaining Quality Attribute

One of the other significant housing attributes that must be considered in the studies of the housing attributes is the quality, and its associates. "residing with its qualitative concepts are the primary conditions of being a human "Norberg-Schulz, 2002). Residing is equivalent to housing. Therefore, it is required to interpret the features that include the residence and place of residence. It is why understanding the qualitative and

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non-material features of housing becomes necessary in addition to considering the physical characteristics of the residence place (Khakpour, Ansari, & Tavoosi, 2015).

Concepts such as territory, privacy, safety, comfort, and welfare are the qualitative concepts that we expect to be realized in a house. "Home is related to the known values that give us safety" (Norberg-Schulz). The sense of comfort, safety, and welfare the secondary needs of the human. Although they are not apparently equivalent to the primary needs, their absence will bring the many challenges to continue living (Khakpour, Ansari, & Tavoosi, 2015).

The quality of the environment is an aspect of life quality that includes the people's satisfaction with the symbolic, environmental, socioeconomic, spatial-physical aspects of their living environment. In other words, the quality of the environment does not only consider the realization of the materialistic human needs but also pays attention to provide and improve the social capacities and development of the societies that are effective in their social behavior patterns (Rezaei-Moaeid & Tabimasroor, 2015). This quality is a concept with subjective values from the environments' objectivity. Therefore, it can be said that the general value of the residential environment is equivalent to the total evaluations conducted on the spatial-physical, economic, and social features of the residential environment, indicating the satisfaction or dissatisfaction of the citizens with their housing (Bahrampour & Modiri, 2015).

4.2.7. Explaining the Affordance Attribute

By analyzing the methods and different techniques of measuring the housing attributes, Coolen (2015) points out that these various methods are only focused on what people want, while the reason why they want these attributes is neglected. Therefore, Coolen (2015) developed and presented Affordance Based Housing Preferences that main focus on which is on the purposes and activities that people want to perceive through their housing. The housing features have many potentials and affordances potentially. These affordances lead to many activities or might include psychological functions or even values (Coolen, 2008). Jon Lang introduces the environment's affordance as the potential or the quality of an environment to do a particular action or activity (Lang, 2002). These environments have a set of behavior affordances that is called a potential environment for human behavior. The affordance (Gibson, 1986; 1979) is based on the relationships between the human and the environment and highlights the cohesion between the structural features of the environment and the desires and purposes of individuals. The housing features have

many potential affordances. These affordances lead to many activities or might include psychological functions or even values (Coolen, 2008).

Coolen (2007) believes that physical characteristics and non-physical characteristics provide the potential affordances for housing, while people only use a limited number of potential functions of the housing. Also, he states that affordances are the inherent characteristics of housing. On the other hand, there is another type of environmental affordance that is based on the audience's recognition and understanding. When a function is allocated to a characteristic, a relationship will be established between the function and characteristic that is called affordance (Chemero, 2003; Coolen, 2008). In this concept, the affordances might include basic concepts (Chemero, 2003). In this case, the affordances change a space into a place (Cresswell, 2004).

This relationship originates from the individual who has allocated the function, and the understanding and recognition of the affordance are only related to that individual. That is to say, understanding a relationship between the feature and function might be not possible for some people while it might be possible for others. In this case, these environments that have a set of perceived affordances are called an effective behavior environment. Therefore, the affordances can be divided into two parts: the environmental affordances that the environment contains them and individuals recognize and understand them based on their competencies. Another type is the perceived environmental affordances through which, the individuals can turn the potential environment into an effective environment behavior.

One of the significant areas in the discussion of capability is "flexibility", and its various types include diversity, adaptability, and variability. In general, flexibility is the affordance of change in things and objects, and in architecture, it means the spatial flexibility and organization of the human-made space and changing it to achieve the conditions, needs, and new applications (Einifar, 2003).

4.3. Determining The Housing Attributes

In this stage, the coding process was done as in the previous stage by authors to extract the components of each one of the housing attributes considered in the selected studies. In this phase of coding, the paradoxical cases were also investigated and reformed after critical analysis, and the results were presented in a content-purpose table (Table 5). The total number of conducted coding was 215, classified into 26 components, and the frequency and frequency percentage of each component were also calculated.

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Table 5. Components of Housing Attributes Considered in the Selected Studies

Housing Attributes	Components of Housing Attributes	Total Frequency of the Coded Components Per Attribute	Frequency of Component	Frequency Percentage of the Component
Meanings and Values	The perceived concrete meanings of the physical characteristics of the environment	17	8	47%
	Design and architecture style (including modern, traditional, empirical, creative, aesthetic, and so on)		4	23.5%
	The perceived concrete meanings of the non-physical characteristics of the environment (conceptual aspects)		5	29.5%
Behavior Settings System	The number of simultaneous activities done in every space, such as the number of rooms	36	4	11.1%
	The type of activities done in every space, such as a kitchen, dining room, garden, parking, the porch or balcony, small library, bedroom, parents room, bathroom		20	55.5%
	Separating similar activities such as recreational spaces or open private spaces, services spaces (laundry room, butler's pantry), private and group working spaces, study room, sleeping space, exclusive parking path		12	33.4%
Constituent Components and Elements of Space	Fixed elements, including infrastructures, structures, walls, floors, ceilings, columns, openings	36	10	27.7%
	Semi-fixed elements, including furniture, decorations, decorative elements, plants, curtains, lighting, and acoustic systems		19	52.7%
	Non-fixed elements, including humans and animals, activities and their behavior		7	19.6%
Physical Characteristics	Spatial sizes and dimensions	60	14	23.3%
	Consumed materials		12	20%
	Physical and inherent characteristics and features such as the particular number of rooms, texture, color, and density		13	21.6%
	Type of housing		9	15%
	Form and shape (spatial proportions)		3	5%
	Characteristics of neighborhood unit (placement and housing position and accesses)		7	11.6%
	Standards and regulations		2	3.5%
Function	Desired environmental qualities, such as warm and pleasant space, the health of the internal spaces, maintaining private territory, expensive materials, vitality, security, adjacent landscapes	21	11	52.3%
	Appropriate spatial dimensions		4	19.1%
	New technologies (Information and communication technology)		3	14.3%
	Environmental protection, construction with permitted materials		3	14.3%
Affordance	Variability (the affordance of spatial improvement, enhancement, and development	32	15	46.8%
	The affordance of adaptability, i.e., compatibility with space or new conditions		10	31.2%
	Diversity affordance (multifunctionality of spaces)		7	22%
-	The total frequency of the coded components	215		-

5. RESEARCH FINDINGS

The results obtained from the data content analysis on each one of the housing attributes and their constituent elements are as follows:

5.1. The Results Obtained From Analyzing the Meaning and Values Attribute and Its Components

Out of 33 selected studies, 14 studies (42.4%) considered meanings and values as one of the housing attributes in their research process share of which of the total coded attributes (99 codes) is 14.1% Also, out of the total number of coded components of this attribute (17 codes), the maximum and minimum frequency among the components of this attributes are as follows, respectively: the perceived concrete meanings of the physical characteristics of the environment 47% (8 codes), the perceived concrete meanings of the non-physical characteristics of the environment (conceptual aspects) 29.5% (5 codes), and the architecture and design style 23.5% (4 codes).

5.2. The Results Obtained From Analyzing tThe Behavior Settings System Attribute and Its Components

Out of 33 selected studies, 16 studies considered the behavior settings system as one of the housing attributes in their research process share of which of the total coded attributes (99 codes) is 16.2% Also, out of the total number of the coded components (36 codes), the maximum and minimum frequency among the components of this attribute are as follows, respectively: the type of activities done in every space 55.5% (20 codes), separating the similar activities 33.4% (12 codes), and the number of activities conducted simultaneously 11.1% (4 codes).

5.3. The Results Obtained From Analyzing the Constituent Components and Elements of Space Attribute and Its Components

Out of 33 selected studies, 16 studies (48.5%) considered the constituent elements and components of spaces as one of the housing attributes in their studies, the share of which out of the total number of the coded attributes (99 codes) is 16.2% Also, out of the total coded components (36 codes), the maximum and minimum frequency among the components of this attribute are as follows, respectively: the components of the semi-fixed elements 52.7% (19 codes), the components of fixed elements 27.7% (10 codes), and the components of non-fixed elements 19.6% (7 codes).

5.4. The Results Obtained From Analyzing the Attribute of the Physical Characteristics and Its Components

Out of 33 selected studies, 23 studies (69.7%) considered the physical characteristics as one of the housing attributes in their research process, the share of which out of the total number of the coded attributes (99 codes) is 23.2%. Also, out of the total number of the coded components of this attribute (60 codes), the maximum and minimum frequency among the components of this attribute are as follows, respective: spatial dimensions and size 23.3% (14 codes), the physical and inherent characteristics 21.6% (13 codes), the consumed materials 20% (12 codes, the type of housing 15% (9 codes), the neighborhood unit characteristics 11.6% (7 codes), the form and shape (spatial proportions) 5% (3 codes), and standards and regulations 3.5% (2 codes).

5.5. The Results Obtained From Analyzing the Function Attribute and Its Components

Out of 33 selected studies, 8 studies (24.3%) considered function as one of the housing attributes in their research process, the share of which out of the total number of coded attributes (99 codes) is 8.1%. Also, out of the total number of the coded components of this attribute (13 codes), the maximum and minimum frequency among the components of this attribute are as follows respectively: significant functions of housing (such as shelter, privacy, safety, control, prevention, and social status) 53.8% (7codes), privacy (separating the public and private spaces) and introversion and extroversion subjects 30.7% (4 codes), and style of design to meet the residents' needs 15.5% (2codes).

5.6. The Results Obtained From Analyzing the Quality Attribute and Its Components

Out of 33 selected studies, 12 studies (36.3%) considered quality as one of the housing attributes in their research process, the share of which out of the total number of the coded attributes (99 codes) is 12.1%). Also, out of the total number of the coded components of this attribute, the maximum and minimum frequency among the components of this attribute are as follows, respectively: the desired environmental quality (such as warm and pleasant space, the health of the internal spaces, maintaining the private territory, expensive materials, vitality, security, and adjacent landscapes) 52.3% (11 codes), appropriate spatial dimensions 19.1% (4codes), environmental protection 14.3% (3 codes), and new technologies 14.3% (3 codes).

5.7. The Results Obtained From Analyzing the Affordance Attribute and Its Components

Out of 33 selected studies, 10 studies (30.3%) considered affordance as one of the housing attributes in their research process, the share of which out of the total number of the coded attributes (99 codes) is 10.1%. Also, out of the total number of the coded components of this attribute, the maximum and minimum frequency among the components of this attribute are as follows,

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respectively: variability affordance (the affordance of spatial development, enhancement, and improvement) 46.8% (15 codes), adaptability affordance 31.2% (10codes), and diversity affordance (multifunctionality of spaces) 22% (7 codes).

6. DISCUSSION AND CONCLUSION

A systematic review of the revealed housing preferences showed a particular lack of structured studies in identifying and classifying the housing attributes and their components. According to the opinions of many scholars, this issue caused many ambiguities in this research area. Despite this deficit, the current study tried to explain a particular classification of the housing attributes systematically while introducing 33 reliable studies. The result of these studies led to identifying seven classes of housing attributes that were applied in the selected studies, including meanings and values, behavior settings system, constituent components and elements of space, physical characteristics, function, quality, and affordance. Also, 26 components were identified for the seven classes of housing attributes.

The findings showed that the housing attributes do not merely include the physical characteristics of housing but also, they can be some levels of consequences such as activities, behaviors, or values. It is because what an individual considers as a consequence or value, it might be considered an attribute for someone else (and vice versa). Therefore, the housing attributes can be considered based on three constituent levels of conceptual models of meaning structure methods (attribute, manifest function, latent function) and the means-end chain (attribute-consequence- value). It is noteworthy that separating these seven classes of housing attribute conceptual, semantically, and structural is difficult and requires a profound interpretation and rooting. Also, there might be some cases that cannot be considered in this classification (such as paradoxical cases that the authors faced for classifying these components in the coding phase).

Thus, it is suggested to study all the possible situations, and the closest attribute is selected for these cases.

Furthermore, according to the conducted analysis in this research, the following attributes have the maximum and minimum frequency among the preferred housing attributes of the residents, respectively, including physical characteristics (23.2%), constituent components and elements of space (16.2%), behavior settings system (16.2%), meanings and values (14.1%), quality (12.1%), affordance (10.1%), and function (8.1%), indicating more relative attraction and significance of these attributes for the residents based on their stated preferences.

However, the stated preferences of housing on the housing attributes that are not dependent on a particular type of housing or place show a relatively limitless evaluation of the attraction and fascination of an attribute to other attributes. It might have directed a choice and end it. Thus, the preferential attributes categorized in this study reflect the value-oriented and goal-directed choice behaviors that are the result of the shared influence of residents' ideal, desires, expectations, demands, and expectations of housing and their preferred traits. Eventually, they lead to determining the usefulness of that attribute by residents. Recognition of this usefulness is also influenced by factors that can be considered as filters affecting the evaluation and measurement of features. These factors directly or indirectly affect the preference of housing attributes and direct, control, or change their choice behavior.

Therefore, considering the meaning and concepts of the preferential attributes, there is an urgent need for further research in future studies on all three dimensions affecting the preference of these attributes. Besides, accurate recognition of these dimensions can provide access to the concrete meanings and values hidden in the preferences of residents, and the results obtained from applying them in the planning process and housing design for the residents can be utilized.

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