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Assessment Level of Cultural Satisfaction of Residents Regarding Environmental Factors in Residential Complexes Via Utilization of POE Principles & Methods

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ABSTRACT

This research is in line with explaining the design problems of residential complexes from the users' point of view by POE evaluation according to its cultural context. Therefore, it seems that this process can be a way to achieve a pattern between designers and users, residents' satisfaction, as well as the correct system to improve the spatial quality of such environments, given the culture and lifestyle of its residents. Recognizing the current situation of users' residential quality, measuring user satisfaction and their type of interaction with designers, feedback to correct design defects and errors identified and results and experiences in the form of systematic strategies and models, according to the cultural context of the city, can Provide a solution and system that can be used in future projects and criteria. Independent variables were evaluated after construction and the dependent variable was the spatial quality of residential complexes influenced by cultural factors of users. 5 residential complexes in Ahvaz were compared and studied. The present research is applied research in terms of purpose, which is based on a case study with a qualitative and descriptive-analytical method. And has been done using common library tools as well as field observation. According to the nature of the subject and the studied indicators, the prevailing approach is survey type and using a questionnaire with residents and interviews with architectural experts in the field of housing. In terms of purpose, it is applied-developmental. SPSS software was used in the analysis of the questionnaire. The statistical sample size is obtained using Cochran's formula and based on the number of households living in each residential complex. The research findings confirm that POE, which as an evaluation method focuses on the needs of users to obtain their satisfaction with the environment and show design problems to designers and express its solution, as well as resource management and environmental sustainability. help. Also, measuring the quality of residential complex spaces depends on general factors such as the level of residential satisfaction of residents, the level of interaction between designers and users (participation), and comprehensive planning and design. To investigate each of these cases, it is necessary to pay attention to the cultural context of Ahvaz.

Keywords: *POE, Spatial Quality, Residential Complex, Culture, Ahvaz*

1. Introduction

Construction of housing and residential complexes are transpiring en masse and in large scale within the country. However, there is no accurate assessment on fixing/revising design deficiencies toward gaining user satisfaction. This problem is still quite prevalent throughout Iran, including in Ahvaz (Khuzestan Province).

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Therefore, it appears that this process can be a way to achieve a resolution between designers and users, the satisfaction of residents, as well as a proper system to improve the spatial quality of such environments, with doe consideration to the culture and lifestyle of its residents. Being aware of and recognizing the prevailing situation from the level of residential quality of users, measuring the level of user satisfaction and the type of their interaction with designers, feedback to remedy design deficiencies and errors, and results and experiences in the form of systematic strategies and models (taking into account the cultural context of the city), can provide a solution and a system able to be utilized in future projects and criteria

In this study, the relationship between the level of satisfaction with the quality of architectural space in residential complexes related to cultural demands and context has been pondered. Therefore, initially, the spatial quality concept and its relationship with culture is examined. The evaluation method is POE that helps, after years of operation, to achieve the success rate of designing and implementing residential complexes. Housing is among the requirements of human life wherein quality improvement is considered significant. Dwellings should provide peace and comfort to its inhabitants, hence, in addition to analyzing concepts related to architecture and housing, it is requisite to assess concepts such as quality and satisfaction as well as cultural factors affecting the quality of housing complexes.

2. Research Literature

2.1. Satisfaction in Residential Complexes

The accelerating population growth trend and rapid rise of urbanization, created the need for ever more spatial development of cities [1]. Hence, due to horizontal development limitations and constraints in the city and the profitability of vertical construction, the development of such structures became feasible. A high share and percentage of this development belonged to the housing sector. Mass housing production has been quite popular as a model with advantages such as technical, economic and temporal justifications.

Meade alludes to factors such as compatible neighbors, a sense of neighborhood and continuity, awareness, and a sense of shared destiny. In addition, he also describes characteristics such as the diversity, avoidance of social separation, social convergence, coexistence, participation in values, lack of social tension, lack of obstacles for development, the affinity of citizens to the neighborhood, the sense of ownership, encouraging cooperation, safety [2].

The point to be observed in the study of the process of creating residential complexes in Iran, is that attention to the principles and criteria of urban planning in the planning and design of most residential complexes has always been curtailed and such housing has distanced itself from creating a "desirable" residential environment [3]. This is while housing is among the fundamental human needs and has profound effects on health, social welfare and economic productivity. Personal and social relationships do not play a role in the composition and structure of life anywhere else, such as they do in residential complexes with specific locations.

In residential complexes with new attitudes towards intermediate spaces and defining spaces of transmission from the outer arena, in addition to creating spatial hierarchies, the continuity of spaces and preventing the interference of territories and turmoil, cultural, physical and social continuity between within with the outer environment Is created [4].

Compliant with the above, the residential complexes under assessment in this research can be defined as follows:

-Concentration of more than 10 apartment blocks or 20 villa units in one urban block, designed and combined in an integrated manner.

-The total area of these residential complexes/urban blocks is at least 3000 square meters.

-The complexes have a common public space utilized by residents, where others are not allowed to use or even enter the premises (because most social and cultural interactions take place in within these premises).

-More than 5 years have transpired since their commissioning (in order to be able to properly assess their post-construction operation).

-Be accessible to the researcher.

In a 2004 report by the “RIBA I CABE Institute” about the future of "Housing Construction in Culture, Flexibility & Choice" these topics were identified as key themes for the next 20 years [5]. Residential Satisfaction as a feeling/emotion of satisfaction obtained regrading achieving one 's aspirations, and needs as far as their place of dwelling.

Flexible spaces appear to be the answer to user satisfaction. As mentioned, flexibility is closely connected with the other fundamental concepts (privacy, personal space & territory) as well as behavioral and lifestyle patterns [6], A number of the issues raised vis a vis environmental/surrounding factors apply to

residential complexes and excludes villas & small apartment buildings. (Please see Table 1 below).

Table 1: Final Components for Reviewing & Evaluating the Level of Housing Satisfaction in Residential Complexes, Source: Author.

Factors	Components & Items
Personal Factors	Age, Gender & Socioeconomic Status, Education
Environmental Factors	-Physical-Spatial Factors -Ancillary Facilities Such as Children's Play Area -Size, Such as The Number of Bedrooms, Etc. -Number Of Apartments, Amount of Open Space, Number of Trees & Characteristics of Urban Space -Physical Features: Design Type, Attention to Privacy & Quality Aspects -Access -Lighting & Sound Comfort
Social Factors	-Extended Stay: Interacting with Neighbors -Neighborhood relationships, Partnerships & Shared Values -According to Carney, from the residents' point of view, social factors are the most important satisfaction criterion [7]
Cultural Factors	In Hip's 2010 study, cultural factors such as customs, culture and family structure and attitudes vis a vis the privacy of residents play an important role in their satisfaction and the similarity of cultural factors increase the satisfaction of the complex.
Services Factors	Public Services, Leisure Services, Business Services & Transportation Services
Aesthetic, Experimental, Perceptual Components	-Physical-Spatial Environment -Emotional Perceptual Environment (Such as Human Scale & Proportions -Mental Environment
Environmental Component	Climatic Comfort, Harmonization with Nature

2.2. Cultural Factors Affecting Satisfaction of Spatial Quality in Residential Complexes

Functional and physical quality primarily depends on the efficiency of the building, its practical usability, applicability, functionality and its financial feasibility [8]. Flexibility is among of the most important practical concepts with regard to measuring the functional and physical quality of residential spaces [8]. Habraken states that flexibility in housing is a chain, which includes the physical as well as social with emphasis on compatibility. The concept of flexibility is the ability of a structure to be physically modified and adapt consistent with changing conditions [9]. stipulate that adaptability to the environment in line with applied changes is dependent on both the user's behavior as well as the structure. Flexibility creates residential spaces adaptable to the demands of users with multiple lifestyles [10]. A closer look/analysis reveals that the above factors can be divided into two categories (1-Important factors affecting quality, objective & physical types; 2-Elements impacting quality that are mental/cognitive and are influenced by society and culture. In Table 2 below these factors can be observed (described separately/individually & also comprehensively):

Table 2: Quality Factors on Spaces Objectively & Subjectively Distinguished, Source: Author Using Niaraki & Saneian 1394)

Objective quality (architecture)		Mental quality (community and culture)	
Case	**Quality Interpretation**	**Case**	**Quality Interpretation**
More Free Shaping & Devising of The Plan	Modification, Adaptation, Flexibility & Comfort	Green Area/Space	Outdoor Space with Ability for Social Interaction, Sense of Belonging, Environment, Identity
Acoustic Materials	Technology, Comfort	Acoustic Materials	Culture
Creating A Service Core Within the Plan	Supplier's Private Space, Comfort	Creating A Service Core Within the Plan	Privacy, Lifestyle, Family Interaction
Suitable Facade Textures & Materials	Identity, Sense of Belonging, Comfort	Attention To Privacy	Comfort, Being in Line with Culture & Way of Life

Design Of Complex Entrance, Number of Entrances	Common Space Area in The Middle That Shapes Everything, Safety/Security	Design Of Complex Entrance, Number of Entrances	Sense Of belonging & Identity
Suitable/Sufficient Unit Area	Multipurpose/Multifunctional Private Space	Suitable/Sufficient Unit Area	Appropriate Space for Interaction & Living A Lifestyle
Adequate Number of Windows	Health/Hygiene in Spaces/Environment, Comfort	Reasonable/Logical Density of Buildings	Existence Of Adequate Outdoor Space for Interaction
Provision Of Basic Infrastructure	Housing Health/Hygiene, Comfort	Indoor & Outdoor Plants	Sense Of Belonging, Ability to Shape/Modify Open Spaces
Security, Space/Area for Guards	Security & Safety, Comfort	Security, Space/Area for Guards	Comfort, Social & Cultural Norms
Possibility Of Decorating/Arranging Interior in Various Manners	Privacy Space, Sense of Belonging	Suitable Aesthetics of The Complex	Identity, Sense of Belonging Ability to Shape/Modify Open/Public Spaces
Possibility Of Establishing Health/Hygienic Facilities & Services, Social Spaces, Private Areas	Possibility Of Conducting Family Activities	Good/Suitable View of Units & All Rooms to The Outside	Suitable Space That Can Be Shaped, Privacy,
Complex Meeting Room	Comfort	Complex Meeting Room	Ability For Social Interaction in Common Space, Comfort
Minimal Interior Partition Walls	Multifunctional Space, Changeable & Adaptable, flexibility	Appropriate Number of Rooms	Possibility Of Privacy, Necessary Cultural Boundaries Between Family Members (Privacy Area), Flexibility Appropriate to Lifestyle
Common/Central CCTV	Security	Common/Central CCTV	Preventing Social Harms/Abnormalities to Infiltrate Complex
Suitable Interior Texture & Materials	Comfort	Lobby Should Have Pausing Capabilities	Common Area Should Have Ability for Social Interaction, Sense of Belonging
Entrance Being Suitable & Convenient for Changing Shoes	Suitable Transfer Space, Comfort in Transferring	Access To Neighborhood Facilities & Services	Social Interaction, Convenient Access
Connection Between Kitchen & Balcony	Natural Ventilation, Provision of Lighting & Hygiene	Connection Between Kitchen & Balcony	Focus On Family Lifestyle
Suitable Dimensions & Shape of Living Spaces	Multifunctional Spaces	Suitable Dimensions & Shape of Living Spaces	Focus On Family Life, Possibility for Residents to Interact
Adequate & Natural Light in Living Spaces	Health, comfort	Adequate & Natural Light in Living Spaces	Focus On Family Lifestyle
Central Entrance of Unit	Private Access, Comfort, Private Space Shaping	Central Entrance of Unit	Focus On Family Lifestyle
Catering/Hosting/Party Area	Comfort	Catering/Hosting/Party Area	Focus On Levels/Degrees of Privacy

Considering that people of different ethnicities and customs live in every part of our country, they also have disparate economic, cultural and social conditions. "The quality of space has two meanings; One relates to phenomena such as weather, heat radiation, pollution, noise, etc.; Second relates to the cultural qualities of the environment". As delineated hereinabove regrading mental/cognitive quality, it can be stated that cultural and social factors are part of the mental/cognitive quality category.

Rapaport reckons culture to be an idea, thought, concept and theoretical structure. In the definitions provided regarding culture, various researchers

have highlight the influence of culture on three primary issues: 1-lifestyle; 2-mental aspects & human habits 3-adapting to various environments. When the function of architecture is taken into account in architectural design, the truth is that all aspects of architecture vis a vis human being in cultural, social, historical and geographical contexts should be pondered/considered [11]. Perceptual and semantic quality is an architectural concept that observes the functional qualities of human beings in the environment and is moreover part of human perceptual qualities of space. Since consumer satisfaction is paramount, housing should be commensurate with their traditional values, environmental, religious, cultural and social characteristics [12].

"Architecture cannot be abstract and unrelated to society. This architecture must inevitably be inspired by the foundational context of its culture" [13]. Architecture assists us to place ourselves in the continuity of a culture. Our home and abode are intertwined with our identity and our culture becomes part of our body, being and soul [14]. An outcome of focusing on culture is "qualification" of residences [15]. Many folks prefer to live in houses that are in line and reflect their past culture since such residences, designed in accordance with the people's culture, complement the behavioral patterns of that culture [16]. In combining various aspects of culture with each other, we can observe that the main emphasis is on the way of life/social life of people. Elsewhere, state that the most basic functions, such as eating and sleeping, are methods that occur differently and have different characteristics depending on the diversity of various cultures and environmental conditions.

Religious conservative concepts also create certain limitations/constraints within Iranian culture. These limitations/constraints pertain to the proximity of complexes and units as well as how residential units are divided/separated internally in a building [6]. It can be concluded that some of the most important aspects of lifestyle and culture that affect the shape of a building is how people view/ponder (mental dimension) what "quality housing" is how it leads to "cultural satisfaction".

The following table stipulates the most significant cultural factors and its variables:

Table 3: Cultural Factors & Its Variables, Source: (Author Utilizing the Above-Noted Sources)

	Variables	Description
cultural factors	religious beliefs	It has created special spaces in accordance with the religious culture in housing
	Identity	Identity deals with the qualitative category between man and the environment. A quality whose lack or absence causes human lack of connection with the environment and creates an environment that is illegible and meaningless
	life style	Shared values, daily life and behaviors in a particular social context (Fatehi Peikani, 2010). Valuing the level of brightness of living environments, the amount of sound, the ambient temperature in them, the dimensions, type and shape of stairs are examples of topics that are different in many places

Objective and subjective dimensions of housing satisfaction quality impact residential complexes. In general, the hereinafter factors can be alluded to on the quality and satisfaction of residential complexes based on culture:

-Focusing on the physical environment of housing to fulfill material/aesthetic requirements.

-Utilizing durable materials as well local & indigenous patterns.

-Utilizing latest technologies in constructing the complex.

-Amenities & facilities inside complexes & neighboring units.

-Public & service uses in the complex to adhere to the requirements of residents.

-Various types of plans/designs in the blocks.

-Taking into consideration the religious beliefs of residents (privacy, respect for guests, etc.)

-Familiarity with modern living and designing various types of spaces for public & neighborhood use plus inside the units.

-Spaces for social interactions in neighboring units & public spaces between blocks.

-The quality of spaces in residential complexes is divided into two components: conceptual & material/aesthetic [17].

2.3. Research Background

No instances were found as far as study background with this exactly title or topic. Hence, it was felt this research was doubly necessary. Studies have been conducted in the field of spatial quality and satisfaction, which are pertinent to the research objectives and can help to achieve the study's goals [18]. conducted a study with the aim of assessing the quality components in the Omid Residential Town, Tehran, which revealed that the visual, perceptual, economic, social and temporal components exist at an above average level. There

is *28%* physical quality satisfaction, hence residents appear to be satisfied with their place of dwelling. Regarding improving environmental quality and social sustainability, based on one of the effective factors in improving environmental quality and social sustainability in residential complexes [1] came up with the variables of residential satisfaction, environmental quality and sustainability. The findings are presented as practical solutions in the design of residential complexes. [19] studied the factors affecting the improvement of living conditions of residential complexes grounded on the performance evaluation of eight systems relevant to the pertinent topic. Their findings confirmed that stakeholder synergistic variables such as the standard/criteria program, efficiency, habitability, sustainability and environmental performance are significant in assessing construction/building. Regarding measuring the quality of urban living environment in the city of Urmia, [4], conducted a study. Via utilizing the POE method, their findings indicated that the environmental dimension with an average of 87.2 had an inadequate status, the socio-cultural dimension with an average of 88.2 had a satisfactory status, economic dimension with an average of 68, physical dimension with an average of 59.2, and management dimension with an average of 51.2 all demonstrated low satisfaction by residents.

In their study, [20], analyzed 1041 residents based on 77 residential indicators regarding satisfaction criteria utilizing the existing residential environment questionnaire. In yet another research, Austin examined the role of neighborhood physical indicators in perceptual security. The findings revealed that the socioeconomic status of residents, age and ownership (of residential units) affect how the neighborhood is evaluated. Respectively, folks with lower socioeconomic status, younger people and tenants displaced more satisfaction with the physical indicators of their neighborhood. In 2018, Ibrahim Abbas et al, conducted a survey of 247 people from three Australian counties on their physical space, its impact on the environment and finishing factors. It focused on neighborhood deprivation, active participation, and access. The most important variables of the neighborhood were street type, wardrobe, sidewalks, common open space and public spaces. Ultimately, the findings indicated that outdoor space is the most important predictor for the neighborhood.

Ultimately, what can be obtained generally from background studies is the importance of visual, perceptual, economic, social and temporal components in the level of spatial satisfaction of residents, largely contingent on the cultural context. Another element that has been tested and proven in research to be significant for residents is social sustainability. Social and cultural quality, public services, environmental security, shared open space and public spaces were listed as being the most essential variables of a neighborhood. Finally, the findings point out that outdoor space quality is also among of the most vital satisfaction factors for residential complexes.

3. Research Methodology

As a consequence of the nature of the subject and the indicators of spatial quality in residential complexes analyzed, descriptive-analytical, survey and case study methods were utilized in this study. Specifically, scientific tools such as questionnaires and interviews with residents of these complexes as well as architectural experts in the field of housing were utilized. The research was practical in terms of its objective. Moreover, the key parts of the analysis in this research were conducted via the SPSS software. Thereafter, an assessment of the findings along with the analysis of documentary information were used for the final conclusion as well as futures research.

This study sought to achieve common criteria and rules between spatial quality and post-construction evaluation with a cultural approach in residential complexes in Ahvaz. Resident satisfaction, comprehensive planning and design as well as proper management are among the common and prominent standards of quality in residential spaces as well as post-construction evaluation. According to the research hypotheses, the primary research variables are delineated in the following diagram:

Statistical Society:

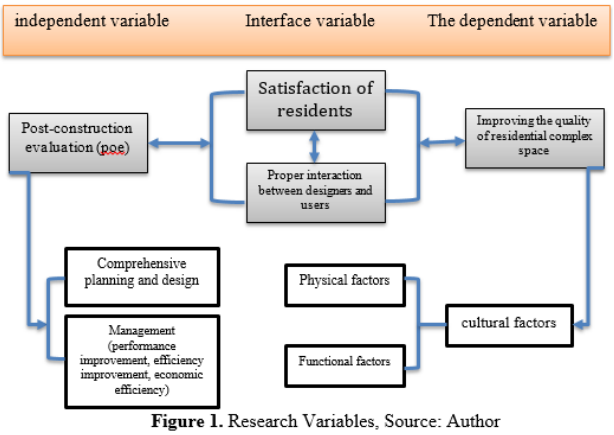


Figure 1. Research Variables, Source: Author

The statistical population in this study is the residents of residential complexes in the city of Ahvaz that were formed in the period after the Islamic Revolution. Samples were selected from organizational and free residential complexes

based on the frequency of demand for housing, crime rate (security) and the vitality of residents and climatic comfort, as well as economic characteristics. from among residential complexes in the city of Ahvaz. Cochran's formula for a limited community (correction of the Cochran's formula for calculating sample size in small communities) The Cochran's formula is used when dealing with large communities (unlimited community). If the sample size is constant, more information is available from a small community than from a large community. Therefore, in the Cochran's formula, a correction is considered which, if the size of the population is small, reduces the number obtained from this formula. Large volume communities are considered as unlimited communities and small volume communities are considered as limited communities. In this case, the sample size is:

$$n = \frac{n_{\circ}}{1+\frac{n_{\circ}-1}{N}}.$$

In the above formula, N is the community size, sample size in the original Cochran's formula, and n is the corrected and new sample size. In the 5 selected residential complexes, the total number of families in the target community is about 1000, then the number of questionnaires is 279.

$$n = \frac{385}{1+\frac{384}{1000}} = 278.17 \approx 279.$$

The unit and foundation of the community are measured by the households living in these complexes. Using the Cochran sampling formula, the sample size is obtained based on the population of each set.

Statistical Population:

The statistical population in this study were the residential complex inhabitants in the city of Ahvaz. It is notable that residential complexes were all constructed after the Islamic Revolution. Samples were selected from residential complexes (large organization complexes & independent) based on demand frequency for housing, crime rate (security) and the vitality of residents and their comfort level with various indicators such as the climate, as well as economic characteristics.

Table 4. Table of general characteristics of all respondents, Source: Authors

Required feature	A table of general characteristics of the total respondents	
*	Resident of the desired residential complex	
	Owner of a residential unit	
	Landlord of a residential unit for more than 2 years	
*	Be over 18 years old	
*	Equally composed of men and women	
*	Be a native of Ahvaz	

The unit and basis were households living in these complexes. Utilizing the Cochran sampling formula, the sample size was obtained based on the population of each complex. The Selected Ahvaz residential complexes included the following:

-Khuzestan Steel Industries 200-Unit Residential Complex

-Naft (Oil) Town Residential Complex; Golestan Water & Electricity Residential Complex

-Sugarcane Development Residential Complex

-Residential Complex for Engineers (Engineers Alley)

-Jawaheri Alley Residential Development Complex

Closed Questionnaire Based on Likert Scale Evaluation:

These questions were based on the respondent's replies to the perceptual (mental) and material (objective) components, on the one hand, and the legal, behavioral technical and functional evaluation of the building on the other hand. The building were of special significance as far as the scope of the research.

cultural and perceptual (mental) components as well as the legal behavioral evaluation of the

4. Findings:

4.1. Satisfaction Model of Culture-Based Spatial Quality in Residential Complexes with POE Method

In this study, the post-operation evaluation method was utilized. Experts have verified the value and veracity of this method. [21]. Literally, POE is the structure's assessment pursuant to the time of its utilization [8]. It is during this period that multiple hidden flaws of the building become evident and are identifiable. Consequently, legal and cultural assessment is an integral part of the evaluation discussion and among the evaluation indicators in the new framework. In addition to the technical and functional issues (shared in the primary sources by Westminster & Preiser toward development of this method), behavioral issues can also be clearly discussed due to their importance in ecology and culture.

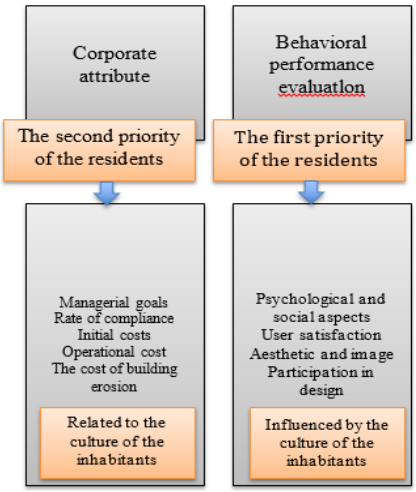


Figure 2: The Final Framework in The Evaluation in Line with The Views of Experts & Based on Iranian Culture, Source: Author Utilizing Sources, 2020

Almost all connection with culture falls under the category of behavioral evaluation of the complex, which includes micro-factors such as user satisfaction from psychological and socio-cultural aspects, etc. Secondly, legal issues have a two-way interaction with the culture of the residents. However, as noted, some objective factors can also impact mental elements such as culture. Therefore, under the components of the first two instances, cases pertinent to this discussion can be found on a case-by-case basis.

On the other hand, the factors impacting satisfaction are in four categories: social, architectural, environmental and cultural factors. Researchers have endeavored to focus on influential variables in order to extract the right criteria for evaluating satisfaction. One of the most important criteria was the motivation of the residents for living there. Additionally, the length of stay of people in the residential unit greatly affects their satisfaction. Therefore, in the statistical community review section, special focus should be placed on this issue. The level of satisfaction with the living environment in relation to cultural and social factors is related to the beliefs, customs and social conditions of the place of residence and its compliance with the criteria of residents. This study emphasizes the cultural issues affecting satisfaction. Among the variables affecting the evaluation is the following:

As mentioned in the study of spatial quality, subjective or perceptual and objective or material factors should be taken into account in assessing the quality and satisfaction of a residential building. Sometimes a material component can lead to the inference of a cultural behavior. Fixed indicators should be measured, but their basic role should be understood through interpretation. Meanwhile, the role of time and future needs that may occur in a housing is one of the things that play an important role in the level of satisfaction of independent users. Based on the above conceptual model, the characteristics and their selection can be achieved in evaluating the residential units of each study sample. These characteristics in each case sample should be tested by a questionnaire where the amount of each can be measured.

4.2. Extracting Ahvaz's Cultural Elements

In order to study Ahvaz's residential complexes, it was necessary to comprehend the cultural characteristics of this city, Ahvaz has a multiple identity and therefore any human study of Ahvaz should be based on these different identities. The multiple identity of Ahvaz is rooted in the history and climate of Khuzestan. Both Khuzestan and Ahvaz, have diverse identities, and therefore Ahvaz can be viewed not only as a center, but also as an extract and a small sample of entire Khuzestan. Culture is among the most significant factors impacting housing satisfaction. Meanwhile, planners, designers and architects pay more attention to physical characteristics [9]. In the definitions of culture provided by researchers, culture is influenced by three primary topics (lifestyle, mental aspects, human habits & harmonization with various environments.

The city of Ahvaz, despite social and economic changes and transformations that have occurred elsewhere in the country, region and province, has gradually deteriorated. Undoubtedly, the departure of indigenous peoples from the city and their replacement by poor immigrants is the most important reason for the heterogeneity and incoherent cultural and social structure of the city. The fact that lower socioeconomic classes have moved there has negatively affected the physical

condition of the city. The incoherent social structure as well as the prevalence of multiple social issues are among the other weaknesses and problems in the city. Residents' satisfaction with living in the city is mostly due to habituation and economic inability even though they readily admit the city has major issues and problems. On the other hand, the turbulent conditions after the war have intensified the city's deterioration. The characteristics that are significant in this area and can be effective in the construction of residential complexes are divided into three general categories of religious beliefs, lifestyle and identity. Among the cultural features of Ahvaz, the most important that can be key in the design of its residential complexes are:

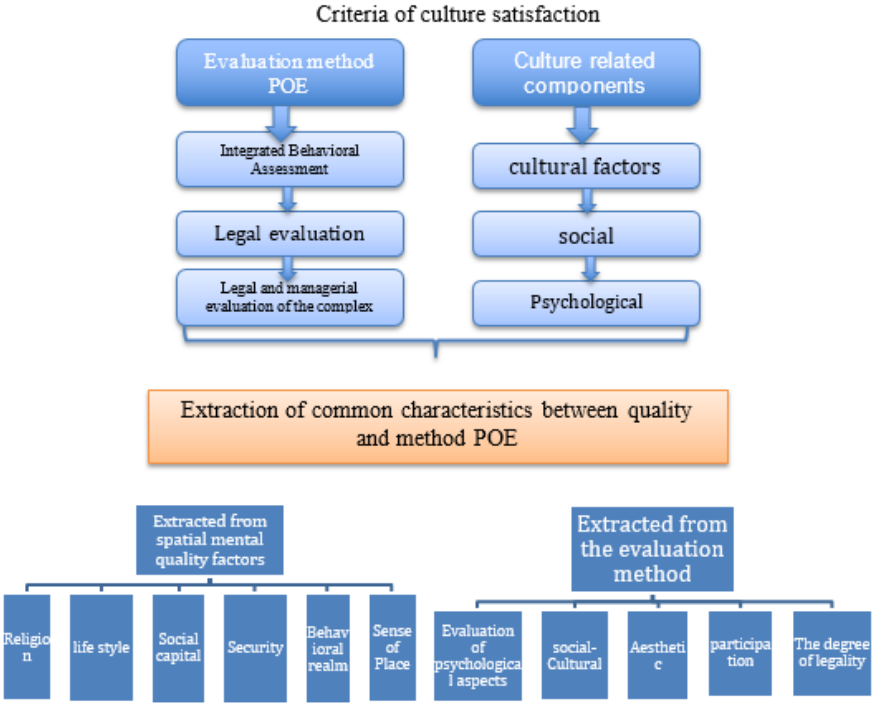


Figure 3: Satisfaction with Culture-Based Spatial Quality in Residential Complexes with POE Method, Source: Author.

Figure 4: Significant Cultural Factors in Ahvaz, Source: (Author)

4.3. Indicative Cultural Factors in Ahvaz

Once the criteria measured in the POE method have been identified with a culture-based approach, these criteria need to be converted into measurable indicators. (To be able to utilize them in questionnaires and interview questions). Indicators such as density level of green areas were small and

indicators such as sufficient light and brightness were also evaluated via observation.
Assessing the locations where the final questionnaire should be filled out. For this purpose, the method of preparing the initial questionnaire and cluster sampling were utilized. At this stage, the interview method and the initial questionnaire were deployed.

Table 5. Criteria & How They Relate To Each Other In Compiling a Questionnaire, Source: Author.

Criteria For Devsing Questions Based On POE	Criteria For Devsing Questions Based on Environmental Quality	Sub-Criteria
Legal & Behavioral Evaluation of The Structure	Perceptual (Mental) Components	Cultural Factors
Legal & Behavioral Evaluation of The Structure	Perceptual (Mental) Components	Social Factors
Legal & Behavioral Evaluation of The Structure	Perceptual (Mental) Components	Psychological Factors
Legal & Behavioral Evaluation of The Structure	Perceptual (Mental) Components	Experimental Aesthetic Factors
Technical & Functional Assessment of The Structure	Material Components (Objective)	Environmental-Physical Factors
Technical & Functional Assessment of The Structure	Material Components (Objective)	Functional Factors
Technical & Functional Assessment of The Structure	Material Components (Objective)	Environmental Factor

The questions are based on the two main research variables and the Likert scale.

Table 6: Sub-cultural and social criteria evaluated in selected complexes, Source: Author.

Row	Sub-criteria of cultural and social factors that have been examined in the evaluation of these complexes
1	Outdoor space with the ability to interact socially, sense of belonging, environment, identity
2	Culture
3	Confidentiality, lifestyle, family interaction
4	Comfort, fit with culture and way of life
5	Sense of belonging, identity
6	Appropriate dimensions for interaction and lifestyle implementation
7	Provide adequate outdoor and interactive space
8	A sense of belonging, shaping open space
9	Comfort, social and cultural norms
10	Identity, sense of place, shaping public space
11	Supplier and shaper space, privacy, privacy control, privacy
12	Middle space with the ability to interact socially, identity, comfort
13	Possibility of privacy, necessary and cultural boundaries between family members (privacy domain), flexibility appropriate to lifestyle
14	Prevent social anomalies
15	Middle space with the ability to interact socially, a sense of belonging
16	Proper access, social interaction
17	Social interaction, convenient access
18	Pay attention to the field of family life
19	Paying attention to the field of family life, providing the possibility of members' interaction
20	Pay attention to the field of family life
21	Pay attention to the field of family life
22	Pay attention to the degrees of privacy

- Discussion: Examining the hypotheses in case studies

Hypothesis 1: It seems that the main criteria for measuring spatial quality in the residential complex of Naft town in Ahvaz based on (EOP), the effect of mental and objective factors such as eco-culture on the interaction between designers and users and residential satisfaction of users. The table below displays the findings of univariate t-test to examine the average of the primry criteria for measuring spatial quality in Ahvaz's Oil Town Residential Complex.

Hypothesis 2: It appears that by measuring the criteria of spatial quality in residential complexes

in Ahvaz, the level of satisfaction among residents and recognizing the weight of interfering factors in the two categories of normal and abnormal, a framework for developing environmental improvement criteria in residential complexes can be arrived at. In this chapter, we analyzed and tested various items in selected complexes. These complexes are: Naft (Oil) Town Complex, Engineers Complex, Sugarcane Complex, Chamran Professors Complex, Boostan Gat Complex. The information is summarized in the table below.

Table 7: Univariate T-Test to Evaluate the Mean of The Primary Criteria for Measuring Spatial Quality in Selected Ahvaz Complexes, Source: Author

Criteria	Factor	QTY	Mean	Standard Deviation	T-Stat	Significance Level
Engineers Complex						
Perceptual (Mental) Components	Cultural Factors	67	۲/۷٦	۰/۳٥	٥/۳٤	۰/۰۰
Perceptual (Mental) Components	Social Factors	67	۳/۰۷	۰/۳٦	۱/٦٦	۰/۱۰
Perceptual (Mental) Components	Psychological Factors	67	۲/٦۰	۰/۳٥	۹/۱۲	۰/۰۰
Perceptual (Mental) Components	Experimental Aesthetic Factors	67	۳/۳۱	۰/٥۷	٤/٤٦	۰/۰۰
Perceptual (Mental) Components	Environmental-Physical Factors	67	۳/۱۰	۰/٤۹	۱/٦٥	۰/۱۰
Material Components (Objective)	Functional Factors	67	۳/۱۷	۰/۳۹	۳/۷٥	۰/۰۰
Material Components (Objective)	Environmental Factor	67	۳/۱۰	۰/٤۹	۱/٦٥	۰/۱۰
Sugarcane Complex						
Perceptual (Mental) Components	Cultural Factors	37	۲/۷۷	۰/٥٦	۲/٤۲	۰/۰۲
Perceptual (Mental) Components	Social Factors	37	۲/۷۸	۰/٤۹	۲/٦۷	۰/۰۱
Perceptual (Mental) Components	Psychological Factors	37	۲/٤۳	۰/٦۰	٥/٦۹	۰/۰۰
Perceptual (Mental) Components	Experimental Aesthetic Factors	37	۲/۷۲	۰/۷۳	۲/۳۱	۰/۰۲
Material Components (Objective)	Environmental-Physical Factors	37	۲/٥۰	۰/٥۹	٥/۰۳	۰/۰۰
Material Components (Objective)	Functional Factors	37	۲/۴۴	۰/۶۱	٥/۴۱	۰/۰۰
Material Components (Objective)	Environmental Factor	37	۲/٥۰	۰/٥۹	٥/۰۳	۰/۰۰
Chamran Professors Complex						
Perceptual (Mental) Components	Cultural Factors 37		۲/۹۹			
Perceptual (Mental) Components	Social Factors	37	۳/۲۱	۰/٥۲	۰/۰۹	۰/۹۲
Perceptual (Mental) Components	Psychological Factors	37	۲/۸٥	۰/۴٥	۲/۸۲	۰/۰۰
Perceptual (Mental) Components	Experimental Aesthetic Factors	37	۳/۳۳	۰/٥۶	۱/٥۱	۰/۱۳
Material Components (Objective)	Environmental-Physical Factors	37	۳/۲۰	۰/۶۹	۲/۹۲	۰/۰۰
Material Components (Objective)	Functional Factors	37	۳/۲۸	۰/۶٥	۱/۸۸	۰/۰٦
Material Components (Objective)	Environmental Factor	37	۳/۲۰	۰/۴۶	۳/۶۸	۰/۰۰
Boostan Gate Complex						

Perceptual (Mental) Components Cultural Factors 37						
Perceptual (Mental) Components	Social Factors	37	۲/۹۹	۰/۵۲	۰/۹۲	۰/۹۲
Perceptual (Mental) Components	Psychological Factors	37	۳/۲۱	۰/۴۵	۰/۰۰	۰/۰۰
Perceptual (Mental) Components	Experimental Aesthetic Factors	37	۲/۸۵	۰/۵۶	۰/۱۳	۰/۱۳
Material Components (Objective)	Environmental-Physical Factors	37	۳/۳۳	۰/۶۹	۰/۰۰	۰/۰۰
Material Components (Objective)	Functional Factors	37	۳/۲۰	۰/۶۵	۰/۰۶	۰/۰۶
Material Components (Objective)	Environmental Factor	37	۳/۲۸	۰/۴۶	۰/۰۰	۰/۰۰
Naft (Oil) Town Complex						
Perceptual (Mental) Components	Cultural Factors 206					
Perceptual (Mental) Components	Social Factors	206	۳/۲۷	۰/۶۷	۵/۸۱	۰/۰۰
Perceptual (Mental) Components	Psychological Factors	206	۳/۴۲	۰/۵۲	۱۱/۵۹	۰/۰۰
Perceptual (Mental) Components	Experimental Aesthetic Factors	206	۳/۲۶	۰/۸۴	۴/۵۵	۰/۰۰
Material Components (Objective)	Environmental-Physical Factors	206	۳/۵۱	۰/۶۷	۱۱/۰۷	۰/۰۰
Material Components (Objective)	Functional Factors	206	۳/۴۵	۰/۶۷	۹/۶۴	۰/۰۰
Material Components (Objective)	Environmental Factor	206	۳/۵۵	۰/۵۸	۱۳/۵۶	۰/۰۰

Naft (Oil) Town Residential Complex: From the description of SPSS software data from the questionnaire information of Naft Town Complex and the findings of the table above, the significance level of the t-test for the mean cultural criterion is 0.00, which is less than the error value of the test. Hence, the null hypothesis is rejected. In other words, the average cultural standard is not statistically equal to 3 (it is 3.27), which is higher than average. The significance level of the t-test for the mean social criterion is 0.00, which is smaller than the error value of the test. As a result, the null hypothesis is rejected. In other words, the average social criterion is not statistically equal to 3 (it is 3.42), Regarding the second hypothesis, it seems that by measuring the spatial quality criteria in residential complexes in Ahvaz, the level of satisfaction among residents and recognizing the weight of interfering factors in the two categories of normal and abnormal, a framework for developing environmental improvement criteria in residential complexes can be accomplished. In line with the findings, the mean of all criteria is higher than average. Therefore, all criteria fall into the category of normal intervening factors.

-Engineers Dormitory Residential Complex.: Regarding the description of SPSS software data from the questionnaire information of the Engineers Complex, the mean cultural standard is 2.76. Which is lower than average. The significance level of the t-test for the average social criterion is 0.10, larger than the error value of the test, hence, the null hypothesis is adopted. In other words, the average social criterion is statistically equal to 3. Regarding the second hypothesis, the following analysis can be offered. Based on this hypothesis, it appears that by measuring the space quality criteria in the Ahvaz Engineers Residential Complex, the level of satisfaction among residents and recognizing the weight of interfering factors in both normal and abnormal categories, can be a framework for developing environmental improvement criteria in the residential complex. According to the results obtained from the table, it is concluded that the average cultural and psychological criteria of the Engineers Dormitory Complex are below average, the mean of social, environmental-physical and environmental criteria are average and the mean of experimental-aesthetic criteria is above average performance. Therefore, cultural and psychological criteria are in the

category of abnormal interfering factors and experimental-aesthetic. Plus, functional criteria are in the category of normal intervening factors. In other words, by modifying the cultural and psychological conditions of the complex, a framework can be achieved to formulate environmental improvement criteria in the Engineers Dormitory Residential Complex.

-Sugarcane Residential Complex: From the description of SPSS software data from the Sugarcane Complex questionnaire information, it can be deduced that the significance level of the t-test for the average cultural criterion is 0.02, which is less than the error value of the test. In other words, the average cultural standard is not statistically equal to 3 (it is 2.77), which is lower than average. The significance level of the t-test for the mean social criterion is to 0.01, which because it is smaller than the error value of the test, hence, the null hypothesis is rejected. In other words, the average social criterion is not 3 (it is 2.78). Regarding the second hypothesis in relation to this complex, it appears that according to the obtained findings, the mean of all criteria is lower than the average. Therefore, all criteria fall into the category of abnormal interfering factors. In other words, by modifying the cultural, social, psychological, experimental-aesthetic and environmental-physical, functional and environmental patterns, a framework can be achieved to formulate environmental improvement criteria in the Sugarcane Residential Complex. As far as the second hypothesis, it appears that by measuring the criteria of spatial quality in the Sugarcane Residential Complex in Ahvaz, the level of satisfaction among residents and recognizing the weight of interfering factors in both normal and abnormal categories, can be a framework for developing environmental improvement criteria in residential complexes.

Chamran Residential Complex for Professors: From the description of SPSS software data from the Chamran Residential Complex for Professors questionnaire, it can be deduced that the significance level of t-test for the average cultural criterion is 0.00, which is less than the error value of the test. Hence, the null hypothesis is rejected. In other words, the average cultural standard is not statistically equal to 3 (it is 2.74), which is lower than average. Based on these findings, the second hypothesis, which was: "Space in the residential complex of Ahvaz Professors Dormitory", the level of satisfaction in the residents and recognizing the weight of the factors, in two categories of normal and abnormal, a framework for developing environmental improvement criteria in the complexes can be arrived at. In light of the findings, the mean of all criteria is average and above average and they are in the category of normal intervening factors.

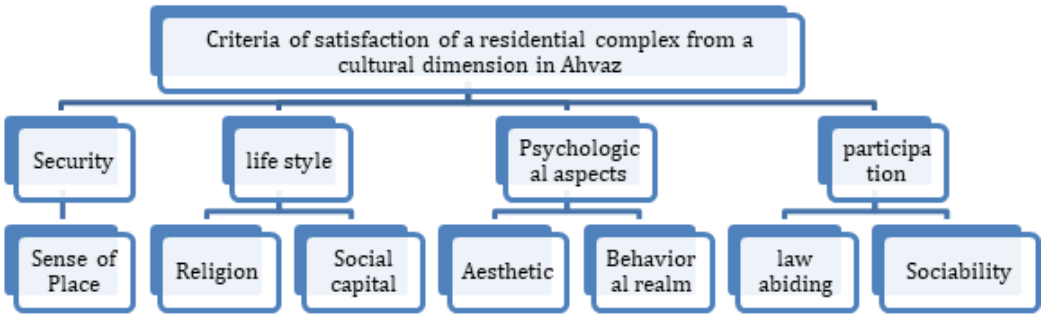
-Boostan Gate Residential Complex: From the description of the SPSS software data from the questionnaire information of the Boostan Gate Complex, the significance level of t-test for the mean cultural criterion is 0.04, which is less than the error value of the test, hence, the null hypothesis is rejected. In other words, the average cultural standard is not statistically equal to 3 (it is 2.75), which is lower than average. The significance level of the t-test for the average social criterion was 0.27, which was larger than the error value of the test.

Findings on the second hypothesis and in relation to this complex reveal that the mean of all criteria is below average. Therefore, all criteria are among intervening factors category. In other words, by modifying the patterns, a framework can be achieved to formulate the criteria for improving the environment in the residential complex of Boostan Gate. It is worth mentioning that according to the second hypothesis, the level of satisfaction in residents and recognizing the weight of interfering factors in the two categories (normal & abnormal), can lead to a framework for developing environmental improvement criteria in residential complexes.

The findings of this calculation indicated that cultural factors play more of a role in north Ahvaz complexes.

5-Summary & Conclusion:

The final criteria for developing residential complexes satisfaction model in Ahvaz were obtained, which are as follows (hierarchically):



The impact of each of these criteria can be varied from the other, but some criteria may be superior to others, and moreover, some criteria may be contradictory. According to the findings, maximum cultural satisfaction factors are specific to the complexes in the northern parts of Ahvaz or the affluent areas. As noted, the socioeconomic criteria of the or the level of enjoyment of residents can be the most important factors as far as satisfaction. On the other hand, it is worth mentioning that the residents being native/indigenous and a sense of belonging to the city of Ahvaz has given more weight to cultural satisfaction. Via utilizing the method of documented research and logical relationships, and hence including its findings in futures research, the present study can lead to the development and improvement of environmental quality in these complexes in the city of Ahvaz.

Consistent with the findings of this study, the following strategies are hereby proposed toward enhancing the cultural satisfaction of residential complexes in Ahvaz:

-Granting authority and developing the decision-making capabilities of the Department of Architectural Education concerning the formulation of laws and regulations, while taking into consideration the unique nature of the field of architecture as an interdisciplinary field of art and humanities

-Survey of the opinions of user's vis a vis the construction of future residential complexes by planners and city managers

-Extensive implementation of evaluations regarding other complexes in the city

-Planning toward addressing issues, damages, etc., in existing residential complexes

-Preparation of cultural collection manuscripts from various parts of the country based on their cultural particularities

-Creating face-to-face relationships between people and users, on the one hand, with architects and planners as well as private sector developers on the other hand

Innovation aspect of the present research results:

Two internal consistency methods (Cronbach's alpha) and two halves were used to evaluate the reliability. The validity of the questionnaire was assessed in three ways: construct validity (factor analysis), concurrent validity and content validity. Data were analyzed by SPSS-15 software.

Results: The results of factor analysis indicated the existence of two factors of cultural factors and satisfaction in this questionnaire, which explained 67.69% of the total variance. In simultaneous validity, the correlation coefficient between the mean of the first 14 questions of the questionnaire and question 15 was 0.827. In the content validity study, the validity coefficient of the total questions of the questionnaire was 0.920. Examination of the internal consistency of the questions showed that all the questions in the questionnaire have a high correlation. Cronbach's alpha coefficient was 0.947 and the reliability of halving the test was 0.884.

Conclusion: The results of this study show that the questionnaire has the necessary validity and reliability and is a suitable tool for evaluating residential complexes in Ahvaz.

The present study is innovative in that it first deals with the relationship between cultural characteristics and post-construction evaluation or POE. In most similar studies, the physical or standard aspect of post-construction evaluation was emphasized and culture as a mental disorder. It is the missing link in this research that is central to this research.

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