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# An Explanation of Evaluation Model of Choices and Preferences for Residential-Apartment Buildings in Urban Districts; Case Studies: Districts 1, 6, 13 and 22 of Tehran[*]

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## ABSTRACT

Considering the nature of housing, the individual needs to make choices and preferences about it. This research aims to investigate a relationship model of residential preferences criteria among citizens of Tehran. This research has a cross-sectional survey methodology and bases the individual to be the analysis unit. The statistical population of this study was composed of Tehran's citizens of over 18 years. Three hundred ten people were selected as the statistical sample via systematic random sampling. Data were gathered from a researcher-made questionnaire, and statistical analysis methods such as confirmatory factor analysis, single-sample mean differences, multi-sample mean differences and path analysis were used to analyze the data. One-sample mean differences test showed that all indicators were important for respondents. Mean difference analysis suggested that "social-cultural", "structural-physical", "environmental", and "economical" criteria were respectively important in selecting housing and that they were of the same importance in different urban districts, as no significant difference was noted in those different districts. The "economical" criterion, although accounted for the least degree of importance, had a significant effect on the importance of other criteria, as suggested by the path model. Research showed that the findings could be utilized by planners and housing policymakers, and architectural designers.

**Keywords**: Housing Choices, Housing Architecture, Residential-Apartment Buildings, Confirmatory Factor Analysis.

## 1. INTRODUCTION

Housing is a basic need of human societies and may be one of the basic human needs that have taken physical form. Housing as a spatial embodiment and structural representation of human residential activities in the environment is thought of as the smallest geographical unit which serves as an indicator to evaluate human development and social civility (Shams & Gomar, 2015; Abedini & Karimi, 2016; Oladapo, 2006). Lexically, housing refers to the embodiment of humans' ideals, beliefs, and performances that act to consolidate the family, social progress, and the economy. Housing is, in fact, a need, not a want (Ziari & Ghasemi, 2015; Abdi-Ghahroudi, 2005). The concept of housing involves both physical place and residential area and refers to a broad category that includes all essential services and facilities required for living with a family, employment, education, and healthcare plans (Pourmohammadi, 2010). Housing leaves a deep impact on the individual's health, social welfare and economic efficiency (Jiboye, 2010).

Housing is a part of public welfare, which cannot be limited to the individual's financial abilities. Housing is a structural reflection of development and serves as one of the most important physical and structural development indicators (Latif, Sheikhi, & Isalou, 2015). Providing housing for all people in the community is an inevitably essential need because housing, especially good one, can provide for the welfare and comfort of the people and is an inseparable part of human rights (Tavakkoli-Nia & Zarghami, 2018). The right to appropriate housing for all people in the society was gradually recognized in industrial countries in the later twentieth century as a "citizenship" right, as one of the main government tasks was to provide housing for people (Athari, 2017).

As per principle 31 of the Constitution, it is a right of every Iranian to access appropriate housing, as clauses 29 and 42 also articulate the provision of the minimum residential requirements for all Iranian citizens within the government's activities (Hezar-Jaribi & Emami-Ghaffari, 2018). Housing is a multi-dimensional category that concerns quantitative and qualitative concepts (Rezaei-Rad et al., 2013). In the meantime, the National Development Plans have stressed the category of housing and its importance in the economy, society and culture, suggesting it falls under the most significant parts of the social-economic development planning (Rezaei-Rad et al., 2010). The success of implementing housing production policies requires recognizing consumers' choices and preferences for certain features (Rahimi-Kakehjoub et al., 2011). The understanding of preferences has a direct and basic relationship with three concepts of good, bad, and better, which are the key concepts of values (Farahani & Movahhed, 2003). Thus, housing selection based on individual preferences reduces the

level of complaints which, as a result, helps achieve a higher degree of homogeneity between real situations and conditions intended (Wang & Li, 2004). The definition and broad concept of housing do not refer to a residential unit; rather, it embraces the whole residential area (Ziari, 2015). Housing cannot be regarded as a simple structure; but rather as a multi-faceted entity that concerns different dimensions: place, fabric, physique, economy, social factors, etc. (Ajza-Shokuhi & Arfaai, 2014; Ansari, 2015).

The qualitative dimension of the housing contains broad dimensions that include social, psychological, cultural, and ideologic concepts, which affect the form of housing and the way housing is used and the preferences people have in different societies. These dimensions also influence ideals and choices (Heidari et al., 2018). For this, there is a need beyond plans because choices should demonstrate a public face of the private life. This denotes compliance with economical, political and cultural conditions, especially the individual philosophy that differs from one in different societies. As a result, it is critical to identify the common preferences of life in society and their effects on design (Asefi & Imani, 2015).

Residents in cities tend to change their residency for various reasons. In this connection, they are naturally faced with the issue of selecting desirable housing. If issues are determined, architects, designers and constructors can provide better designs for desirable housing units and optimize private spaces. People's housing selection is based on their residential preferences, measured by appropriate tools. People's preferences concerning desirable housing are influenced by their needs and how they are served at the house intended (Heidari, 2017). Preferences and choices of housing depend on a large number of factors (Ströbele & Hunziker, 2017).

People's residential preferences indicate their ideal mental image of a residential environment, which is sometimes embodied in reality and sometimes remains in the form of a fantasy image. The reality is that these preferences direct the individual's motives and help him /her select his/her appropriate housing, as people select their houses by using their mental preferences (Coolen & Jansen, 2012, p. 609). To achieve a sustainable housing industry, policymakers should integrate their measures with consumers' needs, wants and preferences (Tech-Hong, 2012). Consistent with the theme of the research, the main questions are (1) What are the criteria and indicators affecting the selection of apartment housing? (2) What is the degree of importance of each criterion for housing selection? (3) What is the degree of importance of each indicator on housing selection? (4) Do urban districts differ in the criteria affecting housing selection? (5) To what extent does the factorial model show the appropriate empirical fit with empirical data? Moreover, (6) What are the effects of the criteria on each other in the structural model?

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This study aims to answer all the questions above.

## 2. RESEARCH METHODOLOGY

Since the present research aims to describe and analyze the attitudes of a society sample and generalize the findings to the whole population, it adopts a cross-sectional survey methodology. This study falls under intensive research from an analytical point of view, is cross-sectional in terms of time limits and is applied in terms of applied research.

### 2.1. Statistical Population and Sampling Method

The statistical population consisted of people over 18 years of age in districts 1,6, 13 and 22 of Tehran metropolitan. Social class and geographical scattering were taken into account to select the districts. There was no consensus over the sufficiency of the sample for the factor analysis and structural model; however, some researchers determined the least sample size to be 200 people (Brown, 2015; Kline, 2010). In confirmatory factor analysis, the least sample size is determined by factors than by variables. If structural equation modelling is used, around 20 samples are required for each factor (latent variable) (Jackson, 2003). Because this research has four latent variables, an 80-individual sample is sufficient to perform the factor analysis. Considering the scattering of urban areas and various characteristics of these districts and that the goal was not just to investigate the construct validity and the degree of importance of residential preference criteria in the four districts were intended, the selection of 80 people could not naturally be rational because the pertinent finding could not be generalized to the selected districts. Thus, 320 people were selected as the sample size, out of which ten individuals were finally removed due to their imperfect questionnaires. In the end, the analyses were performed on 310 people. Table 1 gives the respondents' characteristics.

**Table 1. Respondents' Characteristics**

| Feature | Type or Value | Frequency | % |
|---|---|---|---|
| Gender | Woman | 109 | 35.2 |
| | Man | 201 | 64.8 |
| Marriage Status | Single | 78 | 25.2 |
| | Married | 232 | 74.8 |
| Education | Diploma and Under Diploma | 62 | 20.0 |
| | B.A. | 77 | 24.8 |
| | M.A. | 140 | 45.2 |
| | PhD | 31 | 10.0 |
| Income | Low | 110 | 35.5 |
| | Medium | 185 | 59.7 |
| | High | 15 | 4.8 |
| Residency | District 1 | 80 | 25.8 |
| | District 6 | 80 | 25.8 |
| | District 13 | 75 | 24.2 |
| | District 22 | 75 | 24.2 |
| Mean Age | | 39.21 | |
| Mean Years of Residency | | 14.13 | |

The sampling method was conducted by a systematic random method; in other words, as for the selected districts, the map of districts was used to select various areas, and from the areas, neighborhoods were selected, and from the neighborhoods, several blocks were selected. The blocks, having been selected, the questioners determined the basis of movement in the block from the right direction of the block, selecting one family from every three families residing in the block. Data were gathered via face-to-face interviews and using questioners. The questioners were asked to interview from 5 a.m. to 8 a.m. to increase the possibility of the people's presence in the families and prevent any inconvenience of timing and rest. The mean time spent for the conduct of each interview was 20 minutes, with the process of the interviews

lasting for a month.

## 2.2. Data Gathering and Tools

A researcher-made questionnaire was used because the variables used in the present research were derived from an exploratory study of various Persian and foreign sources employed in this study. Therefore, it was impossible to find a standard questionnaire that would include all the intended variables and criteria. Thus, researchers sought to include all the dimensions intended using previous literature. As the most important tool to gather data, the questionnaire included items that raised the indicators related to the present research's variables. The developed questionnaire contained 69 items on various criteria dimensions and eight more on respondents' demographic characteristics. The first nine items pertained to "social-cultural" criteria used to measure such indicators as "security," "vitality," "population density," "public acceptability," and "attachment." Three items pertained to the "economical" criterion used to measure such indicators as "banking credits" and "prices." Another 43 items pertained to the "structural and physical" criterion, which measured 23 indicators of "building age," "openings," "facilities and equipment, "visual proportions," "materials," "area of the units," "façade style," "building orientation," "dimensions of interior spaces," "functional relations of space," "rooms," "balcony," "quality of communication spaces," "number of stories," "single storey," "service branches and advantages," "structure and skeleton," "number of units," "welfare amenities," "warehouse," "parking lot," campus and landscaping" and "quality of entrance." The last 14 items pertained to the "environmental" criterion that measured 13 indicators of "spatial location," "proximity to the downtown," "proximity to main streets," "proximity to health and treatment centers," and "proximity to the working place," "proximity to educational centers," "proximity to cultural and recreational centers," "neighborhood cleanliness," "distance from highways," "quality of passageways," "quality of neighborhood infrastructure," "adjacency uses" and "access to public transportation." When the questionnaires were given out, the respondents were asked to specify the importance of each indicator by selecting options "very high" (score 5), "high" (score 4), "no idea" (score 3), "low" (score 2) and "very low" (score 1). None of the items required reverse coding, with those selecting option "very high" evaluating the importance of the item as very high; conversely, those who selected the "very low" option determined the importance of the item to be low.

## 2.3. Validity and Reliability of the Research Tool

This research used to face and convergent validity as parts of construct validity to measure the validity of the variables. Construct validity refers to several measured variables which reflect the latent construct (Hair et al., 2009). To examine the face validity, the designed questionnaire, together with criteria and indicators, was provided to 7 experts in sociology (one person), urban development (two people), civil (one person), and urban economics (one person). The experts were required to evaluate the items' conceptual proportions to measure the criteria intended. In this way, experts' consensus was considered a criterion of validity of each item. The experts' criterion of consensus was also the assignment of the mean score of 3 out of 5 for every item, in a way that the item that experts could assign a score of 3 or higher would be realized as valid. In the end, all items acquired mean scores higher than the specified score of 3, indicating the face validity of the tool from the view of the experts.

Besides the face validity, convergent validity was also employed to ensure the validity of the research tool. To estimate the convergent validity, confirmatory factor analysis was used. Confirmatory factor analysis is a major part of structural equation modelling, which is also used to determine the factorial structure of many observed variables. This technique is also used to test the relation between observed variables and their latent structures. It is also employed to test the validity of the measurement tool by determining the constructs and their relevant representations. LISREL (version 8.5) was used to do the confirmatory factor analysis. In the confirmatory factor analysis, goodness-of-fit indicators are also used to indicate the validity of the tool and the factor loads. Figure 1 gives confirmatory factor analysis results. This figure also illustrates the factor loads of every indicator related to the research variables. This figure shows coefficients written in the arrows connecting oval shapes to rectangular shapes, which indicate the factor load of each of the indicators to measure the variable intended. Since factor load values are not so clear due to many indicators, a full description of the factor loads and their coefficients of determination are given in Tables 3-6. As Table 3 shows, all factor loads of the "social-cultural" criterion, excluding the "attachment" indicator, have a significant coefficient of t>1.96. According to this criterion, the "security" indicator with the factor loads of 0.44 and t=7.7 constitutes $R2=39\%$ of the criterion's conceptual space, suggesting that 39% of the "social and cultural" criterion pertains to the "security" indicator. The "vitality" indicator also includes 39% of the "social-cultural" criterion. The "population density" indicator constitutes 51%, while the "public acceptability" constitutes 49% of the criterion's conceptual space. Meanwhile, the "attachment" indicator with factor loads of 0.021 and t=-0.3 constitutes $R2=0.00051$ of the conceptual space of the criterion, suggesting an insignificant value; therefore, this indicator was removed from the statistical equations. This indicator represents the fit of the theoretical model with empirical data, all being at a desirable level. This also suggests that the measurement tool had an appropriate fit and validity (Table 2).

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**Table 2. Goodness-of-fit Indicators of the Model**

| Indicator | GFI | AGFI | CFI | IFI | RMSEA | Chi-square | df | CMIN/DF |
|-----------|-----|------|-----|-----|-------|-----------|-----|---------|
| Value | 0.86 | 0.82 | 0.96 | 0.96 | 0.04 | 1123.15 | 754 | 1.49 |

Table 3 shows that the Cronbach's alpha of the "social-cultural" criterion was 0.77. Table 4 also gives Cronbach's alpha of the "economical" criterion 0.77, 0.96 for the "structural-physical" criterion, as given in Table 5, and 0.87 in Table 6. All these values represent an acceptable ate that indicates the desirability of the research tool.
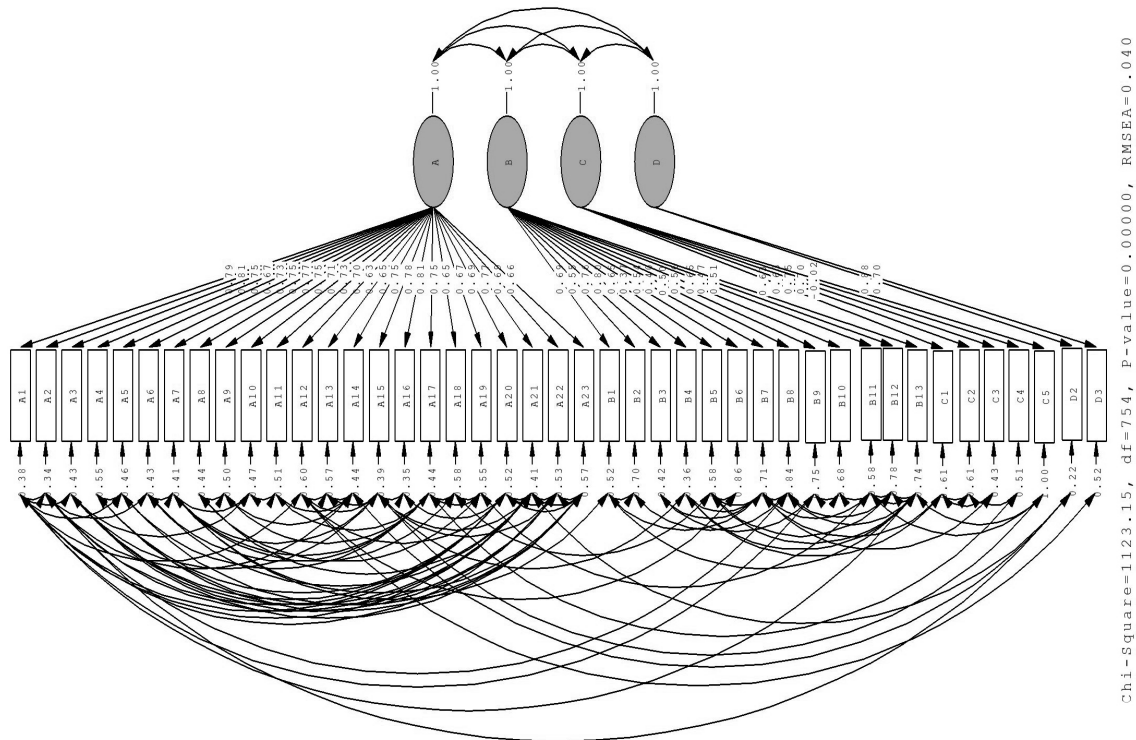


**Fig. 1. Confirmatory Factor Analysis**

## 2.4. Data Analysis

The present research used the survey method to meet four major goals: (1) investigating the construct validity of the measurement tool by the confirmatory factor analysis; (2) determining the relative weight of each of the criteria and indicators and their priority by a comparison of one-sample means; (3) comparison of the significance of various indicators in urban areas by one-way ANOVA and (4) investigating the relations and effects of the variables by correlation tests and path analyses. Statistical software of SPSS (version 2.2) and LISREL (version 8.5) were used to perform the analyses.

## 5. RESEARCH FINDINGS

One of the objectives of the study was to investigate the degree of importance of each of the criteria and indicators of the respondents' residential preferences. For this, the mean scores of each indicator were taken as the basis for determining their importance. Since the questionnaire items were adjusted on a five-degree Likert scale, and the maximum score was 5, their mean value of 2.5 was regarded as the basis point. The one-sample mean differences test was used to determine the difference of scores received based on the determined basis, whose results by criteria are given in Tables 3-6. Table 3 gives a test of mean differences for the "social-cultural" criterion. According to t values and mean of the indicators, the importance of the "security" item is said to be greater than the rest. The "vitality", "public acceptability" and "population density" indicators are ranked second to fourth by the degree of importance of the "social and cultural" criterion. The mean difference indicator and the basis value suggests that the respondents had significantly determined the importance of each of the indicators. This explanation also applies to Tables 4-6. The "attachment" indicator, which was removed in the confirmatory factor analysis, did not have its mean calculated. The total mean of this criterion is 4.09, i.e., the respondents determined the importance

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of this criterion to be 4.09 out of score 5, which indicates the greater importance of this criterion. All the indicators were at a significantly acceptable level of 0.000 which suggests the respondents' significant evaluation of the importance of all criteria and criterion.

**Table 3. Mean Difference Test for the Social and Cultural Criterion**

| Criterion | Indicator | Mean | Standard Deviation | T Value | Sig. | Factor Load Estimation | T Value of Factor Value | Coefficient of Determination (R2) |
|---|---|---|---|---|---|---|---|---|
| Social -Cultural | Security | 4.54 | 0.699 | 51.249 | 0.000 | 0.44 | 7.70 | 0.39 |
| | Vitality | 4.20 | 0.834 | 35.815 | 0.000 | 0.52 | 8.03 | 0.39 |
| | Population Density | 3.74 | 0.944 | 23.164 | 0.000 | 0.71 | 9.19 | 0.57 |
| | Public Acceptability | 3.90 | 0.897 | 27.413 | 0.000 | 0.63 | 9.18 | 0.49 |
| | Attachment | | | | | -0.021 | -0.37 | 0.00051 |
| | General Criterion | 4.09 | 0.650 | 43.087 | 0.000 | Cronbach's Alpha= 0.77 | | |

Table 4 gives mean difference test results for the "economical" items. Considering the t values and mean indicators, the importance of the "price" indicator was greater than other indicators. The "bank credits" indicator was also considered significantly important by respondents. The total mean of this criterion is 3.41, i.e., respondents determined the importance of the criterion to be 3.41 out of score 5, which indicates the relatively good importance of this criterion.

**Tale 4. Mean Difference Test for the "Economical" Criterion**

| Criterion | Indicator | Mean | Standard Deviation | T Value | Sig. | Factor Load Estimation | T Value of Factor Value | Coefficient of Determination (R2) |
|---|---|---|---|---|---|---|---|---|
| Economical | Banking Credit | 3.09 | 1.036 | 10.035 | 0.000 | 0.91 | 10.85 | 0.78 |
| | Price | 3.15 | 1.125 | 10.146 | 0.000 | 0.78 | 9.55 | 0.48 |
| | Total Criterion | 3.41 | 0.752 | 21.445 | 0.000 | Cronbach's Alpha= 0.77 | | |

Table 5 gives the mean difference test results for the "structural-physical" item. Considering t values and mean indicators, the importance of the "facilities and equipment" is greater than other indicators. The "welfare amenities," "structure and skeleton," and "functional relations of the spaces" indicators are ranked second to fourth by the degree of importance of the "structural-physical" criterion, with the mean total criterion standing at 3.80, i.e., respondents determined the importance of this criterion to be 3.80 out of score 5. In other words, this value indicates the relatively good importance of the criterion.

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**Table 5. Mean Difference Test for the "Structural-Physical" Criterion**

| Criterion | Indicator | Mean | Standard Deviation | T Value | Sig. | Factor Load Estimation | T Value of Factor Value | Coefficient of Determination (R2) |
|---|---|---|---|---|---|---|---|---|
| | Building Age | 3.60 | 1.305 | 14.885 | 0.000 | 1.02 | 16.38 | 0.62 |
| | Openings | 4.06 | 1.402 | 19.573 | 0.000 | 1.13 | 17.35 | 0.66 |
| | Facilities and Amenities | 4.33 | 1.438 | 22.437 | 0.000 | 1.00 | 13.86 | 0.49 |
| | Visual Proportions | 3.89 | 1.474 | 16.573 | 0.000 | 0.99 | 13.20 | 0.45 |
| | Materials | 4.12 | 1.403 | 20.288 | 0.000 | 1.03 | 14.83 | 0.54 |
| | Unit Area | 3.54 | 1.313 | 13.924 | 0.000 | 0.99 | 15.31 | 0.57 |
| | Façade Style | 3.58 | 1.322 | 14.355 | 0.000 | 1.01 | 15.76 | 0.59 |
| | Building Orientation | 3.46 | 1.286 | 13.161 | 0.000 | 0.96 | 15.31 | 0.56 |
| | Dimensions of Interior Spaces | 3.78 | 1.472 | 15.278 | 0.000 | 1.04 | 14.12 | 0.50 |
| | Functional Relations of the Spaces | 4.15 | 1.382 | 21.047 | 0.000 | 1.01 | 14.69 | 0.53 |
| Structural-Physical | Rooms | 3.47 | 1.338 | 12.818 | 0.000 | 1.01 | 15.40 | 0.57 |
| | Balcony | 3.45 | 1.429 | 11.649 | 0.000 | 0.91 | 12.52 | 0.40 |
| | Quality of Communication Spaces | 3.55 | 1.371 | 13.464 | 0.000 | 0.89 | 12.70 | 0.43 |
| | Number of Classes | 3.48 | 1.357 | 12.761 | 0.000 | 1.02 | 15.35 | 0.56 |
| | Single Storey | 3.79 | 1.420 | 16.043 | 0.000 | 1.10 | 16.41 | 0.65 |
| | Advantages/ Service Branches | 3.95 | 1.395 | 18.361 | 0.000 | 1.12 | 17.00 | 0.65 |
| | Skeleton and Structure | 4.16 | 1.360 | 21.500 | 0.000 | 1.01 | 15.31 | 0.56 |
| | Number of Units | 3.65 | 1.479 | 13.746 | 0.000 | 0.96 | 12.74 | 0.42 |
| | Welfare Amenities | 4.18 | 1.427 | 20.696 | 0.000 | 0.96 | 13.28 | 0.45 |
| | Warehouse | 3.64 | 1.319 | 15.154 | 0.000 | 0.91 | 13.61 | 0.48 |
| | Parking Lot | 4.05 | 1.405 | 19.483 | 0.000 | 1.07 | 15.78 | 0.59 |
| | Campus and Landscaping | 3.60 | 1.346 | 14.426 | 0.000 | 0.92 | 13.53 | 0.47 |
| | Quality of Entrance | 3.96 | 1.439 | 17.884 | 0.000 | 0.94 | 12.78 | 0.43 |
| | Total Criterion | 3.8022 | 1.02967 | 22.268 | 0.000 | Cronbach's Alpha= 0.96 | | |

Table 6 gives the mean difference test results for the "environmental" item. Considering t values and mean indicators, the importance of the "quality of the neighborhood's infrastructure" is said to be greater than other indicators. The "neighborhood's cleanliness" and "access to public transportation"

indicators are ranked second to fourth by the degree of importance of the "environmental" criterion, with the mean total criterion standing at 3.80, i.e., respondents determined the importance of this criterion to be 3.80 out of score 5. In other words, this value indicates the relatively good importance of the criterion.

**Table 6. Mean Difference Test for the "Environmental" Criterion**

| Criterion | Indicator | Mean | Standard Deviation | T Value | Sig. | Factor Load Estimation | T Value of Factor Value | Coefficient of Determination (R2) |
|---|---|---|---|---|---|---|---|---|
| Environmental | Spatial Location | 3.22 | 1.174 | 10.840 | 0.000 | 0.81 | 13.29 | 0.48 |
| | Proximity to Downtown | 3.84 | 1.333 | 17.722 | 0.000 | 0.60 | 10.20 | 0.30 |
| | Proximity to Main Streets | 3.34 | 1.137 | 13.033 | 0.000 | 0.86 | 14.99 | 0.58 |
| | Proximity to Health and Treatment Centers | 3.22 | 1.075 | 11.782 | 0.000 | 0.85 | 16.29 | 0.64 |
| | Proximity to Place of Work | 3.23 | 1.168 | 11.042 | 0.000 | 0.75 | 12.20 | 0.42 |
| | Proximity to Educational Centers | 3.57 | 1.287 | 14.650 | 0.000 | 0.49 | 6.85 | 0.14 |
| | Proximity to Cultural and Recreational Centers | 3.98 | 1.296 | 20.161 | 0.000 | 0.63 | 8.63 | 0.29 |
| | Neighborhood Cleanliness | 4.27 | 1.214 | 25.723 | 0.000 | 0.48 | 6.97 | 0.16 |
| | Distance from Highways | 3.53 | 1.173 | 15.444 | 0.000 | 0.58 | 9.23 | 0.25 |
| | Quality of Passageways | 3.98 | 1.296 | 20.161 | 0.000 | 0.73 | 10.57 | 0.32 |
| | Quality of Neighborhood Infrastructure | 4.66 | 1.225 | 31.016 | 0.000 | 0.84 | 12.46 | 0.42 |
| | Adjacent Uses | 3.86 | 1.293 | 18.586 | 0.000 | 0.61 | 8.54 | 0.22 |
| | Access t Public Transportation | 4.15 | 1.107 | 26.324 | 0.000 | 0.67 | 9.13 | 0.26 |
| | Total Criterion | 3.7164 | 0.75034 | 28.543 | 0.000 | Cronbach's Alpha= 0.87 | | |

Generally, the mean of twelve indicators of "quality of neighborhood infrastructure," "security," "amenities and equipment, "neighborhood cleanliness," "vitality," "welfare amenities," "structure and skeleton," and "functional relation of spaces," "access to public transportation," "materials," "openings" and "parking lot" were respectively ranked as important by the respondents. As suggested by figure 2, the importance of the criterion "social-cultural" held a

mean rate of 4.09 which is greater than others. The "structural-physical" criterion with a mean of 3.80, the "environmental" criterion with a mean of 3.71, and the "economical" criterion with a mean of 3.41 received the next ranks of importance.

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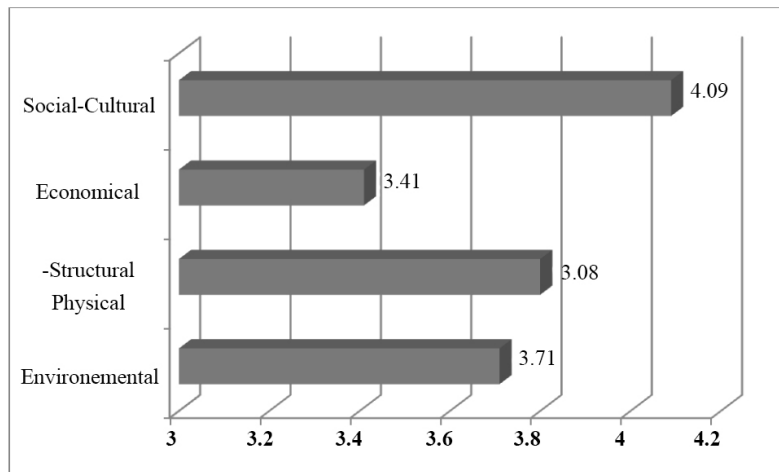Page Numbers: 101-115

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**Fig. 2. Distributions of Mean Importance of Criteria**

To perform a pairwise comparison of the mean difference of criteria, the pairwise mean difference test was used, which is given in Table 7. In the first section of the table, the mean "social and cultural" and "economical" criteria were compared. The "social-cultural" criterion with a mean of 4.0927 was significantly more important than the "economical" criterion with a mean of 3.4161. In the second section of the table, the mean "social-cultural" and "structural-physical" criteria were compared. It is also clear that the "social-cultural" criterion with a mean of 4.0927 was significantly more important than the "economical" criterion with a mean of 3.8022. In the third section of the table, the mean "social-cultural" and "environmental" criteria were compared. The "social-cultural" criterion with a mean of 4.0927 was significantly more important than the "economical" criterion with a mean of 3.7164. In the fourth section of the table, the mean "economical" and "structural-physical" criteria were compared. The "economical" criterion was significantly less important than the "structural-physical" criterion. The mean "economical" and "environmental" criteria were compared in the fifth section of the table. The "economical" criterion was significantly less important than the "environmental" criterion. In the sixth section of the table, the mean "structural-physical" and "environmental" criteria were compared, indicating no significant differences.

**Table 7. Pairwise Mean Differences of Criteria**

| | Mean Pairwise Comparisons | Means | T Value | Sig. |
|---|---|---|---|---|
| First Pair | Social-Cultural | 4.0927 | 18.081 | 0.000 |
| | Social-Cultural | 3.4161 | | |
| Second Pair | Social-Cultural | 4.0927 | 4.650 | 0.000 |
| | Social-Cultural | 3.8022 | | |
| Third Pair | Social-Cultural | 4.0927 | 7.771 | 0.000 |
| | Environmental | 3.7164 | | |
| Fourth Pair | Economical | 3.4161 | -5.766 | 0.000 |
| | Physical-Structural | 3.8022 | | |
| Fifth Pair | Economical | 3.4161 | -6.214 | 0.000 |
| | Environmental | 3.7164 | | |
| Sixth Pair | Physical-Structural | 3.8022 | 1.406 | 0.161 |
| | Environmental | 3.7164 | | |

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Another objective of the research was to compare the mean of the criteria in different districts. The independent multiple-group mean difference test (f) was used to do so. As noted in Table 8, all the comparisons made about the mean of the groups show the mean differences as very low, with f values being also low, as the significance level of all four comparisons was considered to be higher than 0.05. This indicates that none of the criteria significantly differed in different districts. In other words, all the criteria in all the districts were equally important. In sum, the urban district is said to have no role in determining the importance degree of the criteria, as all the criteria were equally important.

**Table 8. Mean Differences Test of Criteria in Different Districts**

| Mean Differences of Districts | | Mean | F Value | Sig. |
|---|---|---|---|---|
| Social-Cultural | District 1 | 4.2025 | | |
| | District 6 | 4.2775 | 0.387 | 0.762 |
| | District 13 | 4.2542 | | |
| | District 22 | 4.2356 | | |
| Economical | District 1 | 3.5906 | | |
| | District 6 | 3.7156 | 0.648 | 0.585 |
| | District 13 | 3.5433 | | |
| | District 22 | 3.6033 | | |
| Structural-Physical | District 1 | 3.6331 | | |
| | District 6 | 3.7325 | 0.960 | 0.412 |
| | District 13 | 3.5933 | | |
| | District 22 | 3.6637 | | |
| Environmental | District 1 | 3.5976 | | |
| | District 6 | 3.7149 | 0.940 | 0.422 |
| | District 13 | 3.5585 | | |
| | District 22 | 3.5677 | | |

Another objective of the research was to investigate the relationship between the criteria and their effects on each other. For this, the path analysis method was employed. The correlation matrix of criteria is calculated to reveal their relationship in the path analysis, which is given in Table 9. This table shows that the "structural-physical" criterion is significantly and positively related to the "environmental" criterion. This table highlights the t values, also. T values are used to measure the correlation significance. If these values are over 1.96, the intended variables are significantly correlated. As seen, all t values are higher than 1.96. The "structural-physical" criterion is positively and significantly related to the "social and cultural" criterion. However, the "structural-physical" criterion is not significantly related to the "economical" criterion. The "environmental" criterion is positively and significantly related to the "social-cultural" criterion. This criterion was also positively and significantly related to the "economical" criterion. Also, the "social and cultural" criterion was positively and significantly related to the "environmental" criterion.

**Table 9. Correlation Coefficient Matrix of the Criteria**

| | Structural-Physical | Environmental | Structural-Physical | Economical |
|---|---|---|---|---|
| Structural-Physical | 1.00 | | | |
| Environmental | 0.31<br>5.82 | 1.00 | | |
| Structural-Physical | 0.24<br>3.93 | 0.25<br>4.01 | 1.00 | |
| Economical | 0.06<br>0.90 | 0.37<br>6.35 | 0.16<br>2.43 | 1.00 |

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The path analysis test was used to evaluate the effects of criteria on each other. Figure 3 and Table 10 give the results. In this figure, there is an external variable which is the "economical" criterion, noted by D. In the path model; there are three internal variables, i.e., the "structural-physical," "environmental," and "social-cultural" criteria shown by A, B and C, respectively. This figure shows that the effect of the "economical" criterion on the "structural-physical" criterion is 0.15, which is significant at t=2.70. The effect of the "economical" criterion on the "environmental" criterion is 0.36, which is significant at t=6.75. The effects of the "economical" criterion on the "structural-physical" criterion is 0.53, which is significant at t=10.59. The effects of the "structural-physical" criterion on the "social-cultural" criterion is 0.10, which is significant at t=2.12. The effects of the "economical" criterion on the "social-cultural" criterion is 0.04, which is significant at t=2.12. Thus, as an external agent, the "economic" criterion is said to have significantly affected other criteria that are also regarded as a driving agent to determine other criteria.
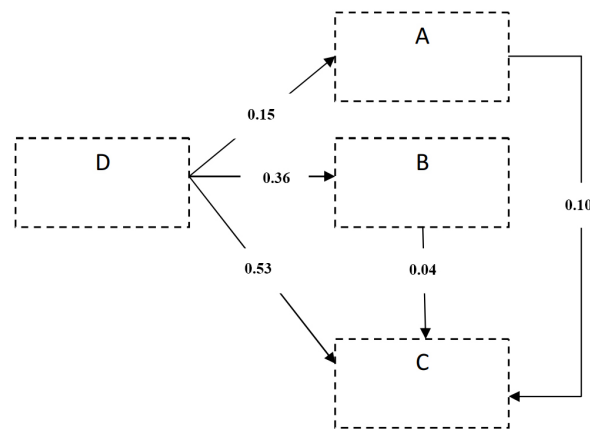


**Fig. 3. Path Analysis of Criteria Effects**

**Table 10. Coefficient Matrix of Criteria Effects**

|  | Beta | | | | Gamma |
|---|---|---|---|---|---|
|  | Structural -Physical | Environmental | Social-Cultural | Economical |  |
| Structural -Physical |  |  |  |  | 0.21 2.70 |
| Environmental |  |  |  |  | 0.36 6.75 |
| Social-Cultural | 0.05 2.12 | 0.03 78 |  |  | 0.39 10.59 |

## 6. DISCUSSION AND CONCLUSION

The present research investigated peoples' residential preferences in districts 1, 6, 13 and 22 of Tehran. A review of the theoretical and empirical literature determined that the four "social-cultural', "economical," "physical-structural," and "environmental" criteria could be considered as factors affecting residential preferences. After the identification of dimensions and indicators related to each of the criteria, a survey was conducted on 310 people in the districts mentioned, which was aimed to (1) test the validity of the factorial model as a theoretical model with empirical data and (2) to determine the goals which aimed to investigate the degree of importance of each of the criteria and relevant indicators. The evaluation of the factorial model's validity using the factor analysis suggested that all indicators held necessary construct validity to be included in the analysis model, except for the "attachment" indicator. Meantime, the "attachment" indicator had achieved the necessary consensus in the face validity to stay in the theoretical model; however, it was determined that it lacked the necessary validity in the public survey. This was due to the complexity and multi-dimensionality of the concept, which

ordinary respondents may have been confused for failure to fully understand the concept under study. Thus, to deal with this concept is required to perform independent research on residential preferences.

A review of the degree of importance of the criteria showed that the "social-cultural" criterion was more important than other criteria in selecting a housing. This finding was consistent with those of Gholizadeh et al. (2010), Anderson et al. (2018) and Jansen and Collen (2011), who stated that housing still greatly contributes to the social life of people. Housing does not serve as luxury goods or capital; rather, it constitutes a major part of the human's identity and creates security. It also brings about dynamism and vitality for humans and establishes a link between man and nature.

As the study found, the "social-cultural" criterion played a major role in residential preferences; it also served as a dependent variable to affect other criteria, especially the "economic" criterion. This finding is in line with those of Akbari et al. (2013), Wang & Li (2006), Heidari (2018), Shirafkan-Lmsou et al. (2019) and Muhammad Zamri et al. (2021), who stated that social and cultural features account for a major part of the economic and material issues of the citizens.

Respondents indeed assigned the least degree of importance to the "economic" criterion when considering residential preferences, but the interrelationship and reciprocal effects of this criterion with other criteria, as suggested by the path model, indicate the underlying role of economic factors in meeting other criteria. This issue is also noted in research by Hasanzadeh et al. (2018), Shirafkan et al. (2019), and Zinas, Jusan, Mulliner & Algrans (2012). Naturally, with the increasing growth of urban populations and disproportionate demographic density of the cities with urban facilities and sources, cities become a scene of competition and conflict between social forces over valuable sources. This can also activate the power-creating sources of the society, including material capital and political power, to seize these valuable sources. Therefore, as the prices of land, equipment and amenities hike, access to these sources will only be made possible for those who are economically capable of gaining such valuable sources.

The study also found that various criteria of urban districts did not have a significant difference. This finding is also in conflict with findings by Jansen (2012) and Sirgy et al. (2005); however, confirming findings by Arvin and Faraji (2018), Jansen and Coolen (2011) and Costa-Font et al. (2009). This issue refers to the homogeneity of the needs and equal understanding of the citizens of housing. This subject indicates that the way citizens evaluate major criteria for residential preferences does not relate to their social and cultural classes. This major sociological finding states that there is not always conformity between real human situations and subjective desires.

Human's subjective world may be equal; however, humans' real and objective conditions include them in separate classes and groups. Although material and economic issues have a less important role in humans' subjective evaluations of residential preferences, a review of the variables suggests that this factor affects their real situation. Because residents of districts 1 and 13 held similar perceptions of the major criteria of residential criteria, a review of the real status of these criteria in their real lives reveals many differences, which may be much different from their subjective evaluations and perceptions.

Considering the gaps noted throughout the text, conducting the following research in the future can fill many of those gaps:

- An independent study on the role of spatial attachment in residential preferences;
- Evaluating the extent to which residents of different districts enjoy the four criteria examined in the present study in a real way;
- An independent study on the role of economic factors in housing preferences.

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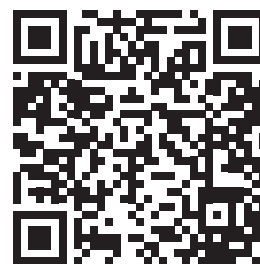
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