

# Analysis of the Relationship between the Physical Structure of Residential Textures and Neighborhood Interactions; Case Study: Relationship between Housing Pattern and Face-to-Face Interactions in Somayyeh, Bajak, and Farhangian Neighborhoods of Qom

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## ABSTRACT

The concept of neighborhood has been long one of the most basic concepts in architecture and urban planning, especially Islamic-Iranian architecture and urban planning. The issue that makes up the main framework of the present study is the decline in the quality of neighborhood relations in the neighborhoods of contemporary Iranian cities. In this regard, the present study seeks to answer the main question that whether there is a logical correlation between the physical structure of the residential textures and neighborhood relations. It is a correlational study in which the physical structure of residential texture (villa or apartment pattern) is considered the independent variable and the social interactions, specifically the face-to-face interactions between the neighbors, are considered the dependent variable. The data has been collected by the library and field methods (using a questionnaire). The questionnaires are distributed to 300 residential units among 581 units in four districts of Qom, among which two districts contain villa textures and two contain apartment textures. It should be noted in the selection of the samples, it has been tried to, except for the physical structure as the independent variable, control the secondary variables (such as the financial status or the length of residence in the neighborhood) that affect the dependent variable (face-to-face interactions), as much as possible. According to the findings, the physical structure of residential textures in four districts of Qom and the social interactions, specifically the face-to-face interactions of the neighbors, are significantly correlated in a way that these interactions are more prevalent in the neighborhoods with villas than neighborhoods with apartments.

**Keywords:** Neighborhood Relations, Villa Neighborhoods, Apartment Complexes, Face-to-Face Interactions.

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## 1. INTRODUCTION

For the neighborhood concept, various definitions can be provided such as a unit of urban geography or a group of people who live in a specified and familiar environment (Zolfaghar Zadeh, Jafariha, and Zende Del 2019, 36). The neighborhood concept is one of the basic concepts in Islamic-Iranian architecture and urban planning investigated in various studies, so far (Raeisi and Mohammad Ali Nejad 2021, 109-121; Movaghar and Pourjafar 2015, 35-56). The neighborhood's environment and neighborhood unit are among the effective factors in the formation of human character since the human grows in this unit and interacts with others. In Islamic teachings, this issue has been dealt with in detail, and it has recommended respecting the neighbors and neighborship in numerous cases (Shahidi 2013, 152; Ibn Shoaba, 2016, 405). It is also true about western scholars, and they have also realized the importance of neighborhood units and the physical environment of the neighborhood in a way that many prominent western architects and scholars have provided some opinions about the neighborhood unit and the physical characteristics of desirable neighborhoods (Ostrowski 1992, 75). For example, Clarence Perry's plan which was implemented in the Radburn Neighborhood by Stein and Henry Wright is one of the most famous examples the western scholars have implemented regarding the neighborhood and neighborhood unit (Aghalatif and Einifar 2011, 21). The objective of the construction of this neighborhood is the creation of a local community in a specified physical area (Lang 2002, 196). In other words, it has been tried to create a local community in the neighborhood by the use of physical design.

In traditional Iranian neighborhoods, social integrity has been created among the residents with a shared value that strengthened the neighbor relations and a sense of collaboration between the neighbors. The neighborhood was considered a suitable body for various social groups with different origins (Saghatoleslami and Aminzadeh 2011, 41). With the emergence of cars and the changes made in the Pahlavi I period, the structure of the neighborhoods underwent a transformation that weakened the relations between the residents, and the change in the texture of the neighborhoods led to a change in communications and interactions. Today, in the modern neighborhoods of Iran, common public spaces have almost vanished, and the lack of sense of place as well as a reduction of social interactions are among its effects (Farkish 2020, 111).

Regarding the significant effects of the physical environment on human behavior and perception, which emerges in various variables such as sense of place, etc. (Mohammad Moradi et al. 2019, 173-192), and regarding the related literature to neighbor relations, it seems that the quality of the physical

structure of the neighborhood is significantly correlated with the neighbors' relations in that neighborhood, and the present study also seeks to deal with the same hypothesis in the contemporary era in Qom.

The studies indicate that social interactions in the neighborhoods and neighborhood units affect the creation of place identity (Bernardo, Manuel, and Oliveria 2016, 249). From many experts' points of view, social relations and interactions can be among the effective factors in the formation of place identity in residential neighborhoods. Cases such as collective memories (Ebrahimi Mojarrad and Mozaffar 2022, 11) and social communications and interactions between the residents are effective in the formation of place identity in the residential places according to the opinions of some experts. The sustainable development of the cities is among the very important components in urban planning and management discussions whose stem cell is the neighborhoods. The sustainable development of the neighborhoods is the requirement for urban sustainable development. One of the important factors in the sustainable development of the neighborhoods is also the socio-cultural dimension and the interactions between the residents in a neighborhood (Sarraf and Ghannad 2019, 88).

Social interactions in the neighborhoods lead to a reduction in social abnormalities (Sar Ali and Pourdeihimi 2016, 11). It is also effective in many other components of urban health. For example, the studies conducted in California indicate that in a sample, 10% of the neighbors who had strong social interactions died while in the same sample with similar conditions, 31% of the people with weak social relations died (Goli Zavvareh 2010, 31). Emphasis on this important matter can be abundantly observed in Islamic teachings. In some hadiths from the Holy Prophet (PBUH), it has been expressed that "be kind to your neighbors so that you will be a true Muslim" (Ansari Qomi 2012, 14). Or, "It is one of the rights of your neighbor to visit him if he is sick... and congratulate him when he is happy" (Ansari Qomi 2012, 291).

So far, the subject of the relationship between physical structure and neighbor relations has been investigated in various studies. For example, it has been noted in a study that in the facing residential blocks where the houses are placed along the street with separate entrances, significant social communication is made among the residents, or people living on the dead-end streets with U-turns know each other better than those living on the crossing streets (Lang et al. 2002, 184). Some studies on the interactions between neighbors in social spaces, which are designed for the same purpose, indicate that citizens participating in social interactions in such spaces are only a part of the population residing in the neighborhood and many social activities take place in other places.

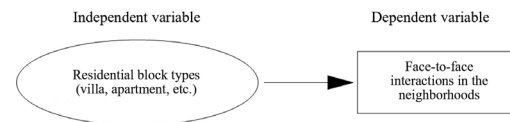
Among these places, the passage-faced terraces and balconies, the doorsteps, etc. can be named since these spaces enable the residents to enjoy the privacy made for them and feel secure and peaceful while communicating with the passers-by and other people in the neighborhood (Ferguson and Ferguson 2016, 196).

Despite the abovementioned, so far, no research has been conducted on the correlation between the neighbors' interactions and the physical structure of the neighborhood, and no comparative studies have been conducted between the interactions in the two physical structures of villa and apartment neighborhoods under Iranian cultural conditions. The present study tries to deal with the same gap.

## 2. CONCEPTUAL FRAMEWORK

So far, various studies have been conducted on the correlation between architecture and urban planning on the one hand, and social relations and interactions on the other hand (Mendes and Cabral 2017, 4; Williams 2005). Based on the findings of most of these studies, any place is configured for specific needs and norms (Lawson 2015, 11), since the structure of a place's architecture is not independent of users' lifestyle and social structure (Aydın and Sıramkaya 2014, 267). The neighborhood, as a complex made up of neighborhood units, space, or behavior settings that should be able to be a suitable container to contain the cultures, customs, behaviors, and lifestyles of its residents (Hamzehnejad and Samimifar 2012, 129). In other words, the neighborhood unit is a specific container or body for the emergence of neighborhood behaviors and interactions which are the contents of this container. In this regard, the objective of architecture and urban planning theoreticians is to make the citizens' behaviors compatible with the neighborhood's body (Lang et al. 2002, 196). Among the most important factors concerning desirable social interactions is face-to-face interaction. Generally, a healthy and collaboration-based relationship between neighbors is started with face-to-face interaction. In the Levinger and Snoek model, in a three-stage process from zero to three, the first stage (a necessary and not a sufficient stage) for a two-way and deep meeting is the presence of face-to-face interactions. He explains that stage zero is a stage where people are unaware of each other's existence, in stage one, the first encounters occur and each party forms their perception of the other party, but a deep connection has not yet been formed, i.e., with the presence of the individuals in common behavior settings or the same neighborhood unit and face-to-face and eye contact allows for the initial acquaintance of people which requires common behavior settings (Sa Ali and Pourdeihimi 2016, 16). It is at this stage that face-to-face relations lead to a serious connection of the man to the place and can create a sense of attachment to

the space in the man (Lang 2002, 179). As a result, it can be said that among the characteristics of a desirable neighborhood is the encouragement of the creation of social interaction conditions and face-to-face relations for the residents and the present study also aimed to measure this characteristic in the two types of villa and apartment neighborhood patterns.



**Fig. 1. Independent and Dependent Variables**

In the Iranian traditional neighborhoods, face-to-face relations and social interactions can be seen abundantly, and factors such as the population texture of the neighborhoods or lack of virtual relationships have been effective in this matter. However, another important factor is the body of neighborhoods that have promoted these face-to-face interactions. For example, old neighborhoods had a center, and the center of the neighborhood, as the neighborhood's heart, has hosted the most interactions and gatherings of people. This center in Iranian traditional neighborhoods includes the mosque, bazaar, bath, etc., and in these places, the possibility of neighbors' exposure and interaction. Based on the abovementioned, the present study, as was mentioned, it has tried to investigate the effects of one of the physical characteristics of the neighborhood, i.e., the residential texture of villa and apartment type, in face-to-face interactions.

## 3. METHODOLOGY

As mentioned in the abstract, the present study aimed to find a correlation between the neighborhood's body and form (specifically the form of residential textures) and the extent of face-to-face social interactions in the neighborhood. It is a correlational study in which it is sought to explore the correlation between two or several variables in a way that they are not controlled by the researcher and the researcher cannot control them due to moral considerations (Groat and Wang 2013, 224). Also, it can be said that in correlational research, the measurement of the correlation between two variables is more important than its analysis and interpretation and the objective is the measurement of the correlation between the dependent and independent variables, which distinguished this type of research from the qualitative research. In the present study, the dependent variable is the neighbor relations, especially face-to-face communications in a neighborhood whose importance was explained in the introduction. In this regard, some questionnaires were designed and it was sought to measure the correlation between the physical pattern of residential texture in

the neighborhoods and face-to-face interactions. The questionnaires were distributed to four neighborhoods or residential complexes on a neighborhood scale. The questionnaires included closed-ended questions in the form of five options from very low to very high. Based on the research framework, the questions were developed for the measurement of social interactions and face-to-face interactions. In other words, the questions are about the extent of familiarity with the neighbors and the interactions between them. The questionnaires were analyzed by the SPSS after being filled in.

The independent variable of the present research, as was previously mentioned, is the physical pattern of the neighborhoods and residential complexes, i.e., the type of residential blocks of the neighborhood which can be villa or apartment type. As mentioned in the abstract, in the selection of the neighborhoods and samples, it has been tried to control other independent variables that affect the dependent variable which is face-to-face interactions. Such variables can be the financial status of the people and the length of their residence in the neighborhood. Therefore, it has been tried to distribute the questionnaires in the neighborhoods and complexes that are somehow similar in terms of these conditions (such as the financial and cultural conditions, length of residence, etc.), so that the measurement of the correlation between the residential texture pattern and face-to-face interactions can be done more reliably.

## 4. DISCUSSION AND ANALYSIS

In this chapter, the case studies are introduced and the data obtained from the residents in these neighborhoods are analyzed.

### 4.1. Introduction of Case Studies

In the present research, four sample neighborhoods or residential complexes in Qom were chosen among which two contained villa housing patterns and two contained complexes with the local scale with apartment housing patterns. It has been tried to choose the samples in a way that secondary independent variables such as financial status, ethnicity, social class, etc. have the least effects on the dependent variable (neighbor relations and interactions), in other words, in the case study samples and neighborhoods, the secondary independent variables equally affect the dependent variable. Therefore, those neighborhoods were chosen first, regarding the longevity (both villa and apartment types) are among the oldest neighborhoods in their type, and their residents have lived in them for a long time. Also, unlike the majority of Qom's neighborhoods whose population is made up of immigrants from surrounding cities and different

ethnicities, these buildings have a homogenous social texture and their residents are mostly originally from Qom.

Second, all four selected neighborhoods are located in relatively high-quality and expensive areas of Qom, and the main economic status of its residents are middle to upper social classes, and it can be said that they have a relatively good financial status, and this characteristic can be seen in all four selected neighborhoods to a high extent. In the case of neighborhood boundaries, apartment neighborhoods, their boundaries are very clear and their spaces and physical boundaries can be clearly defined. In the case of villa neighborhoods, due to the large size of the area, to match the physical scale with apartment samples, it has been tried to specify the area of the neighborhood with the main streets that cross the area. In the following, and before explaining the research findings, these four examples are introduced.

#### 4.1.1. Somayyeh Street Neighborhood

Somayyeh Street is one of the oldest streets in Qom and most of its houses are villas. Most of its residents are old residents of Qom, and in general, the neighborhood has a religious background.

The structure of this neighborhood is clustered. A cluster organization is a type of organization in which space is grouped based on proximity or sharing a common visual relation or feature (D.K. Ching 2009, 230). This issue has caused the creation of narrow and winding alleys as well as dead-end alleys and has created a kind of hierarchy in the said neighborhood (Figs 2 and 3).

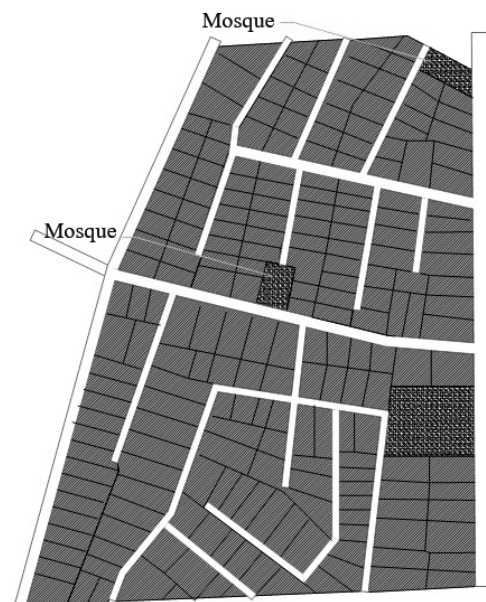


Fig. 2. Somayyeh Street Neighborhood and its Important Spots





Fig. 3. General View of Somayyeh Street

#### 4.1.2. Bajak Neighborhood

Bajak neighborhood is also one of the almost old neighborhoods of Qom and its residents are the old people of the city who, like the previous example, are mostly religious. Almost all the houses in this neighborhood are villas. The selected area has a mosque and a green space in front of it, and next to the mosque, there are several commercial units such as a laundry, supermarket, etc., which can be considered the center of the neighborhood. The organization of this neighborhood is in the form of a grid (checkered)

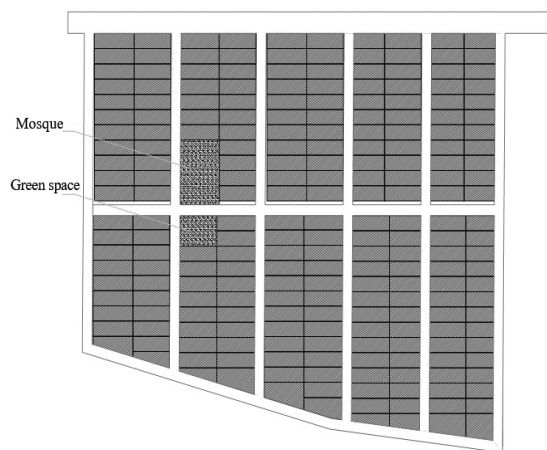


Fig. 4. Bajak Street Neighborhood and its Important Spots

#### 4.1.3. Farhangian Complex

This complex is one of the old residential complexes of Qom. Its construction dates back 15-20 years ago and it was built on Safashahr street for teachers, and still, most of its residents are the same class of people. This complex has nine four-story blocks, where each floor has three to four units, and it can be said that it is one of the samples with high density and can be fully evaluated on the scale of a neighborhood.

(Figs 4 and 5). Of course, this neighborhood has few hierarchies and its checkered streets are wider and have more traffic than the Somayyeh neighborhood. Also, the checkered texture of the streets and the fact that all the streets are interconnected intensifies this characteristic.

Based on the different classifications that have been presented of the types of housing (Pourdeihimi 2012, 50-100; Schoenauer 2001, 55-115), the houses of the two above samples (Somayyeh and Bajak neighborhoods) should be placed in the model of houses each having their private yard.



Fig. 5. General View of Bajak Street

The lobby of these blocks is generally wide, with direct lighting, and the organization system of the blocks is linear, parallel to the 15-meter street, placed in two rows. The spaces between the blocks are dedicated to green space, and there is a larger green space at the end of the site that is equipped with a children's playground. However, according to the type of organization of the blocks, it cannot be said that it has a strong neighborhood center (Figs 6 and 7).

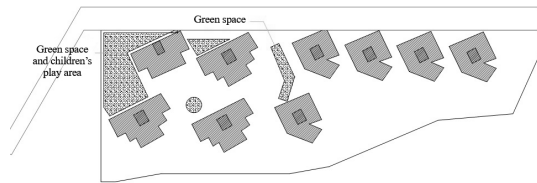


Fig. 6. Farhangian 1 Neighborhood and its Important Spots



Fig. 7. General View of Farhangian 1 Neighborhood

#### 4.1.4. Farhangian 2 Complex

This complex is located on Shahid Sadoughi Boulevard and Nastaran Street, and like the previous one, is one of the old complexes of Qom, dating back to almost twenty years ago, and most of its residents have lived there for a long time.

This residential complex has five six-story residential blocks that are organized in a grid so that the residential blocks and green spaces are arranged in a checkerboard and every other block pattern, so, there is a green space next to each block, according to Figure 8, is enclosed by three other blocks, and from the fourth side, it is enclosed to the street. Also, a part of the pilot of one of the blocks has been dedicated to the prayer and the meeting hall. The land of the

complex is placed diagonally and angled to the main street (Nastaran). This type of residential complex can be called a medium-height apartment, which has an average height of four to eight stories, which was created to make housing more economical, and later became urban housing, and was built in most European countries in the 20th century. (Pourdeihimi 2012, 108). Schoenauer calls such apartments 'Central Access Apartments', which were first designed in 1927 in Berlin. This building is a four-story building and there were four two-bedroom units on each floor. According to Schoenauer, one of the advantages of these complexes, compared to single-unit houses, is the optimal use of land, and compared to residential towers, it has a simpler and cheaper structure and implementation (Schoenauer 2001, 111).

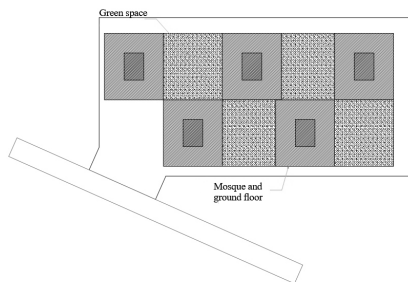


Fig. 8. Farhangian 2 Complex and its Important Spots



Fig. 9. General View of Farhangian 2 Complex

Table 1. Physical Characteristics of the Case Studies

Number	Neighborhood's Name	Type of Housing	Spatial Organization	Neighborhood's Center
1	Bajak	Villa	Grid	Mosque-Park
2	Somayyeh	Villa	Cluster	Mosque
3	Farhangian	Apartment	Linear	Green Space
4	Farhangian 2	Apartment	Grid	Green Space

## 4.2. Data Analysis

About 300 questionnaires were distributed to the four neighborhoods and complexes mentioned in Table 1 to collect the data, of which 246 questionnaires could be analyzed. This quantity of questionnaires provides the necessary data to generalize the results to the entire statistical population. To elaborate, it should be noted that based on the conducted study, there are a total of 581 residential units in the four studied samples, and according to Krejcie and Morgan's table, the questionnaires should have been distributed to at least 231 residential units to generalize the results. Therefore, according to the 246 questionnaires that are the basis of the analysis of the research findings, the number of questionnaires was more than the number required to ensure the validity of the results (246 questionnaires compared to 231 questionnaires required). It should be noted that regarding villa neighborhoods, the studied area is limited to the area between two side streets of the neighborhood. Otherwise, the whole neighborhood would be much bigger and the number of units would be much more than apartment complexes. Questionnaires were evaluated in the form of five-choice questions, and based on the Likert scale, they were scored from 1 to 5. The closer the answer to 5, the closer it is to desirable neighborhood relations. The results of the questionnaires were analyzed by "SPSS" software. According to Table 2, Cronbach's alpha coefficient is 0.65, and according to this coefficient, it can be said that the questionnaires have acceptable validity and reliability. Indeed, in this regard, a different range of various coefficients has been stated in different sources and there is no unanimous number, however, according to the different range that has been stated for this coefficient, the coefficient obtained in this

research (0.65) is authentic based on some references.

**Table 2. Cronbach's Alpha for the Present Research**

Valid and Reliable Statistics	
Number of Questions	Cronbach's Alpha
10	0.65

To approve or reject the research hypothesis (there is a correlation between housing patterns in the neighborhoods' residential textures and face-to-face interactions), the Hypothesis Test for a Population Mean can be used. This table shows whether there is a significant difference between the defined variables in the study. The important part of the table that can be noted is the significance level which is displayed with the symbol "sig" for short. The significance level is the criterion or level known as the basis for significance, which is compared to the first-degree error. This level is mostly considered to be 0.05 in human sciences and 0.01 in medical sciences. If the result of the investigation of the difference or correlation between the variables is lower than 0.050, the possibility of the arbitrariness of this difference or correlation is very low and it can be concluded that the difference or correlation is significant. But, if it is above 0.05, the possibility of the arbitrariness of the result is high and the correlation or difference between the variables is not significant. Therefore, based on the significance level of the study which is 0.008, as shown in the below table, it can be inferred that the findings obtained from the questionnaires in different neighborhoods are significantly different and the residents in these neighborhoods have provided different answers.

**Table 3. Hypothesis Test for a Population Mean**

	Variance Analysis				
	Sum of Data	Degree of Freedom	Data Mean	F-Test	Significance Level
Analysis of Variance between the Neighborhoods	3.252	3	1.084	4.069	0.008
Analysis of Variance within the Neighborhoods	64.476	242	.266		
Total	67.728	245			

In the following table also, the significant difference coefficient between the different blocks and neighborhoods has been noted, and the third column in the table compares the mean answers of each neighborhood in pairs, and those neighborhoods with a significant difference in mean answers are

marked with an asterisk. In the fifth column also, the significance level between the neighborhoods is compared in pairs, and for each pair with a significance level of lower than 0.05, it can be said that there is a significant difference between the answers.

**Table 4. Significant Difference Coefficient between the Face-to-Face Interactions in Different Neighborhoods**

Multiple Comparisons						
Dependent Variable: Face-to-Face Interaction						
LSD						
Neighborhood (I)	Neighborhood (J)	The Mean Difference of Columns I, J	Standard Error	Significant Difference	95% Confidence Level	
					Lower Limit	Upper Limit
Somayyeh Street	Bajak Street	-0.00449	0.09394	0.962	-0.1895	0.1806
	Farhangian 1	0.19551*	0.09394	0.038	0.0105	0.3806
	Farhangian 2	0.26185*	0.10224	0.011	0.0605	0.4632
Bajak Street	Somayyeh Street	0.00449	0.09394	0.962	-0.1806	0.1895
	Farhangian 1	0.20000*	0.08603	0.021	0.0305	0.3695
	Farhangian 2	0.26633*	0.09502	0.005	0.0792	0.4535
Farhangian 1	Somayyeh Street	-0.19551*	0.09394	0.038	-0.3806	-0.0105
	Bajak Street	-0.20000*	0.08603	0.021	-0.3695	-0.0305
	Farhangian 2	0.06633	0.09502	0.486	-0.1208	0.2535
Farhangian 2	Somayyeh Street	-0.26185*	0.10224	0.011	-0.4632	-0.0605
	Bajak Street	-0.26633*	0.09502	0.005	-0.4535	-0.0792
	Farhangian 1	-0.06633	0.09502	0.486	-0.2535	0.1208

\*Mean difference is significant at 0.005

As seen in Table 4, Somayyeh and Bajak neighborhoods are significantly different from Farhangian 1 and Farhangian 2 neighborhoods. In other words, there is a significant difference between the villa and apartment neighborhoods regarding the answers to the questions, however, no such difference is observed within the apartment neighborhoods and villa neighborhoods alone, and the people's answers in the villa neighborhoods have been almost the same, just like the answers of people in apartment neighborhoods.

To approve the research hypothesis, Pearson's correlation test presented in Table 5 can be noted.

After analyzing the data using the correlation method, a number named 'correlation coefficient' is obtained which ranges from -1 to +1. A zero correlation coefficient indicates the non-correlation between the two variables, +1 indicates a totally direct correlation between the two variables, and -1 indicates an inverse correlation between the two variables. Therefore, regarding the number +1, it can be said there is a correlation between the housing pattern in different neighborhoods and face-to-face interactions. Also, the Sig<0.05 is indicative of a significant correlation between these two variables.

**Table 5. Pearson Coefficient Test**

Correlations			
		Neighborhood	Face-to-Face Interaction
Neighborhood	Pearson Correlation	1	0.215**
	Sig. (2-Tailed)		0.001
	N	246	246
Face-to-Face Interaction	Pearson Correlation	0.215**	1
	Sig. (2-Tailed)	0.001	
	N	246	246

\*\*Correlation is significant at 0.001



## 5. CONCLUSION

Based on the data analysis for the dependent variable i.e., face-to-face interaction between the neighbors, it can be said that there is a significant difference between the villa and apartment neighborhoods regarding this variable, and statistically, the answers in villa neighborhoods are different from the answers in apartment neighborhoods in a way that residents in villa neighborhoods have more face-to-face interactions with their neighbors. It should be noted again that it has been tried in this study to control the secondary variables (such as the longevity of the neighborhood, social and economic status, etc.) which can affect face-to-face interactions. Therefore, it is inferred that the reason behind the higher neighbors interactions in villa neighborhoods compared to apartment neighborhoods can be searched in the type of physical structure of the residential texture. Even though there are facilities in the case study apartment neighborhoods that can help with social

interactions (such as the children's playground, green space, shopping centers near or exclusive to the complex, etc.), these facilities have not led to a relative advantage of apartment textures over the villa textures regarding the face-to-face interactions. Therefore, it can be said that based on the data analysis, face-to-face interactions are higher in villa neighborhoods than in apartment neighborhoods, and the villa texture leads to better face-to-face interaction between the neighbors and better acquaintances. However, it seems that the greater gross residential density in apartment textures compared to villa neighborhoods, or the presence of more semi-private and private spaces in villa neighborhoods than in apartment neighborhoods is one of the reasons for more face-to-face interaction in the villa neighborhoods studied in this research, which can be investigated in further studies as the next step to the present study.

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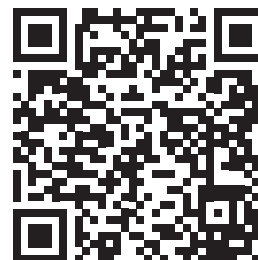
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