Promoting Social and Cultural Aspects of Sustainable Architecture in Tehran Residences

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Abstract

For several decades, Iranian cities are experiencing major and fast urban growth. At the top of them is Tehran, Iran's capital city, with doubled population in 30 years from approximately 6 to 12.5 million in 2016. Undoubtedly such a magnificent raise in population has increased the need for settlements and the city has to respond to it. Today, Tehran is the center for such exogenous development while suffering from a wide range of difficulties in urban development. Since human settlement plays a critical role in urban development, it needs to be considered carefully. Currently, apartment residency is the most common type of dwelling in Tehran, as well as most of Iran's major metropolitan areas. This article focuses on the cultural and social deficiencies of contemporary mass housing in Tehran. A survey is conducted to investigate the seven proposed concepts to promote social facilitation, social participation and cultural aspects of apartment residences. Furthermore, the concepts are aimed to promote place attachment and place identity and raise residential satisfaction as well as quality of life. The results show that, implementing these concepts will promote social and cultural aspects of contemporary residences in Tehran and consequently other fast-growing cities of Iran. Subsequently, such improvement will facilitate in achieving the social and cultural aspects of sustainable urban development in metropolitans in Iran.

Keywords: Sustainable Housing, Apartment Residence, Social Well-being, Cultural Diversity, Iranian Settlements

"A growing Number of Planners and Designers have come to believe that if they can only solve the problems of traffic, they will thereby solve the major problem of cities. Cities have much more intricate economic and social concerns the automobile traffic. …" (Jacobs, 1961, p. 6)

1. Introduction

The undeniable importance of achieving sustainable urban development in Iran, as a developing country,
and the critical role of human settlements in this goal, enhances the importance of considering habitats, as built environments responding to their users' need of home. Human settlements, known as the main parts of the urban area have reciprocal-role relationship with the city and affect it in various ways.

1.1. Background

To date, the identifying characteristics of Tehran cannot be defined in a recognizable pattern; its physical changes that have been caused by an exogenous development neither have the foundations of Iranian-Islamic cities, nor the roots of the modern western cities development. The political and social transformations during the last 200 years seem to be one of the main causes of current Settlement problems in metropolitans in Iran. To summarize, since the 1930s, sudden growth of Iranian cities caused break in the continuous process of physical and spatial change of the cities from the past and 50 years later from importation of condominiums in metropolitans in Iran (Habibi, 2003; Sharifzadegan, Joudi Gollar, & Azizi, 2011; Zebardast, 2006; Azizi & Malek Mohammadnejad, 2008) which dramatically had changed dwellings patterns.

The major and rapid physical transformation of Tehran, as the capital city, in addition to its suburb expansion turns the land and the settlement into a profitable commodity. As a result, quantitative attitudes to settlement, considering its shortage and aiming profitability leads to ignoring a wide range of users' needs and necessities of architecture and urban design. The so called "growth" of Tehran, became a pattern for other cities' development and it has been called "Tehran Style" (Habibi, 2003), which is brought its disadvantages to the rest of the country.

Earlier studies indicate that excessive end eavors which have been made to provide abundant of housing in short time, do not allow enough time for considering family lifestyle as well as arranging social interaction among them consequently their lives will be irreparably damaged. (Ardalan, Sert, Doshi, Safdie, & Kandilis, 1976; Jacobs, 1961)The process of urban development forces most of Tehran residents to choose apartments for their dwelling. Table 1 illustrates how the number of residence units is distributed in two scales of dwelling type; Single-Family houses and apartment units. As the table shows, living in apartment (67%) completely dominates the other dwelling types. This heightens the importance of paying attention to apartments as the most common type of residence in Tehran.

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Table 1
Distribution of Dwelling Types in Tehran by 2011

Dwelling type	Number of Residents in Tehran	%
Apartment Units	1416184	67.48%
Single-Family Houses	682597	32.52%
Total Residence Units	2098781	100.00%

(Source: Tehran MOICT, 2011)

1.2. Current study

In this study, what we mean by condominiums is the dominant type of residential complexes, for instance mass housing, been designed and built simultaneously in the capital city as well as the other major cities of Iran. In such building situation, usually the undivided ownership of the common areas is shared among the apartment owners and there is a need for the owners and co-owners to follow the existing specific rules. These condominiums are various in scales and usually start from 4 building units to more than 100unit high-rise buildings.

Apartment residents in Tehran can be divided into three groups according to the owners' economic status: the affluent group who has preferred to live in apartments of their own choice despite of being aware of its consequences. However, the most common reason for such a choice is its high security in relation to single-family detached housing; the moderate group who are semi-conscious about the conditions of living in apartments while adhering to traditions and being capable of accepting such type of residency consequences; and the third group who do not have any other choices based on their low income. (Jahangiri, Lehsaeizadeh, & Mansourian, 2006)The two latter groups usually choose apartments because they cannot afford the single-family home while the social and cultural problems of mass housing mostly threaten them more than the affluent group. Living in apartments because of the unfavorable economic situation usually does not match the lifestyle of the family and subsequently people do not have proper space for their private affairs and such congestive condition is a source psychological pressure for them.

The current study is initially based on empirical research, which involves personal observation, a study on previous researches, informal interviews and dialogue analysis. Such method helps us to find the problems. Latterly, seven improvement concepts have been proposed here for solving such issues. In addition, an experimental study was implemented in which 300 apartments were selected randomly in Tehran in attempt to find the effectiveness of these concepts and how they could promote the social and cultural aspects of the common apartment residence.

2. Theory

2.1. Social and Cultural aspects of Residential Environment

Residential satisfaction as a life quality indicator can be measured through various factors in an operational standpoint. Usually, studies consider three main aspects for it: spatial (different aspects of physical environment, architectural and town planning), human (social well-being, socio-relational features) and functional (services and facilities). (Rollero & Piccoli, 2010; Bonaiuto, Fornara, & Bonnes, 2003)

Empirical studies show that the place attachment and the place identity are closely connected with the sense of well-being and residential satisfaction. Generally most authors consider mobility, shared meanings, social relationship, cultural level, and length of residence, as the main factors that directly or indirectly enhance attachment to a place and place identity.

Studies on the effect of culture in built environment illustrate that culture plays an essential role in connecting people to their residential environment as well as linking them to the collective identity. (Ragab, 2011; Tavernor, 2007; UNESCO, 2nd November 2001) Accordingly, on one hand considering the relation of culture change and in designing the built environment and hence will positively affect place identity, place attachment residential satisfaction and individual's quality of life and on the other hand, ignoring it may result in reverse.

To conclude, improving place attachment, place identity and social cohesion in residential environment as well as cultural homogeneity with the environment may result in residential satisfaction and subsequently increasing people's quality of life. Accordingly, this leads tithe enhancement of social and cultural aspects of sustainable urban development.

The results confirm the general conclusion made by Gifford (2007b) that high rise residences are more satisfying when they are more costly, better neighborhood located, and freely chosen by its dwellers.

An experimental study on the apartment plans for enhancing social health by Lee, Kim, & Lee (2010) interestingly proposes almost five planing solutions forpromoting social health in public apartments in Korea. Figure 1 illustrates a summary of the theoretical foundation of the article.

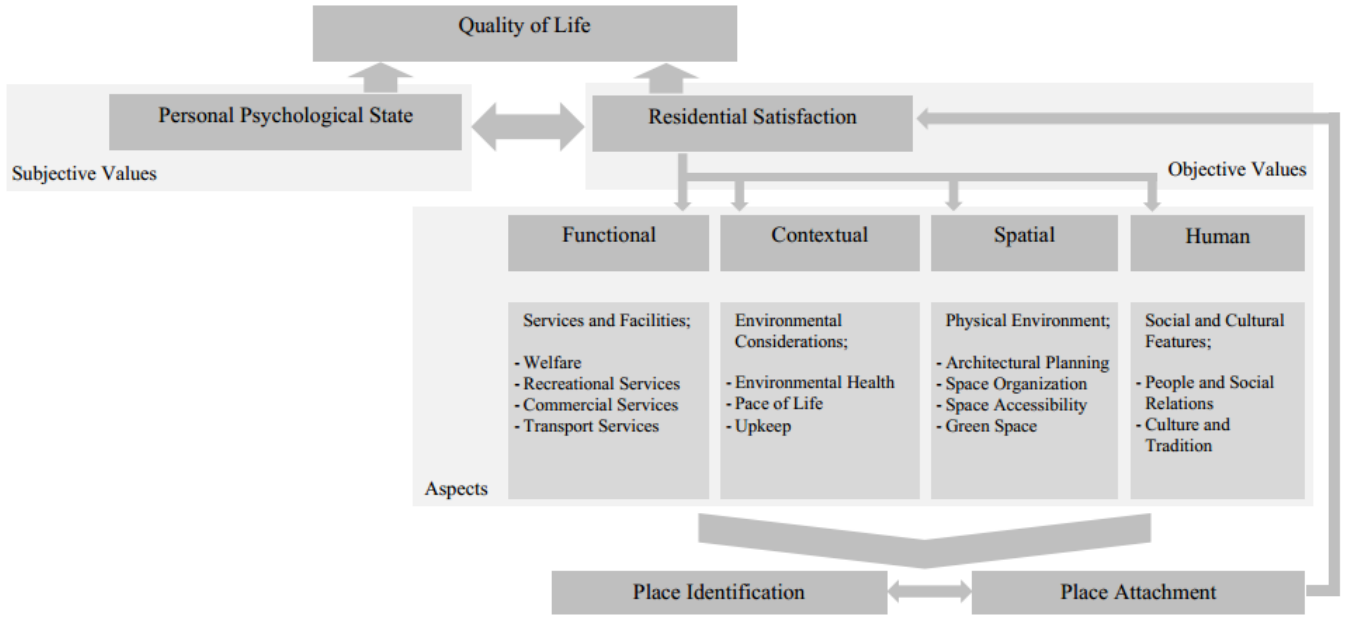


Fig. 1. Theoretical Foundation of the Article, (Source: The Authors)

2.2. Housing in Iran

To date, studying hospitality in Iran is the subject of several researches, which can be divided into three groups. In the first group, the studies focus on examining contemporary housing problems and their causes.

The government believes that the imbalance between supply and demand of housing in Iran is the main cause of housing crisis. However, it seems that the problem is more complicated. Some of the influencing factors are ignoring cultural and social characteristics, lack of suitable patterns, disregarding spatial values, neglecting the seismic situation of the country, low quality of constructions, wasting construction materials and financial resources.(Sartipipoor, 2004; Alalhesabi & Zamani , 2010)

The semi-public or semi-private space between public urban space and private space of apartment is mostly ignored or does not provide the residents with responsive facilities to be socially interactive. This issue is also reviewed by Gifford (2007b) where he concludes that residents in high rises may have fewer social relationships in the buildings, and rarely help each other.

Rafieian, Amin Salehi, & Taghvaei(2010) assessed the quality of dwelling environment in a residential complex in Tehran and found it in an intermediate status. Recently, Pirbabaei & Karami(2011) have investigated the causes for dissatisfaction of a reconstructed neighborhood in Tehranand found that lack of identity and ignoring the social and cultural context of the neighborhood are the two main reasons.

According to Jahangiriet al.(2006), the ideal house for 90% of its study population, is single-family housing and their problems with living in apartments can be summarized in many factors.

According to Gifford (2007b) there is no evidence that high rise dwellings are good for children; high rise residences limit children's outdoor activities which may be the cause for more behavior problems of these children.

The typical mentally privacy borders in Iranian culture are defined in a way that sound transmission through walls and floors causes definite concerns for apartment residents. Unfortunately, those who are involved in construction process usually ignore this fact. Another example in terms of security and privacy concerns is that generally Iranian families in their culture are not comfortable with using street facing balconies. Consequently, the open space of a green public park, a balcony exposed to the street, or a common yard of a condominium does not respond to the family's need for open and green space while it used to be easily responded by the central courtyards in traditional Iranian houses or in the private yards of single-family dwellings.

Concerning the cultural issues, Persian cuisine which is a part of Iranian culture comes with a wide array of aromas and preparations, whereas, the foreign-designed condominiums to the dwelling types of Iranian cities brought a common type of kitchen. The so-called "Open Kitchen" which exposes whole kitchen area to the house, causes restrictions and difficulties to engage in Persian cooking and this is a threat for losing this aspect of culture in Iran.

Another cultural problem seems to be the threat of forgetting cultural ceremonies in future generations;

Iranian culture, society and tradition have a variety of celebrations and ceremonies which involve get-togethers, family reunions, banquets and gatherings. For instance, Nowruz, Yalda Nightetc., which are threatened to be ignored by difficulties of engaging them in the restricted areas of the apartment units.

In the second group of studies, several researches have been done to find ways to promote the quality of residences in Iranian cities. According to Aeinifar (2000), since the relationship between designer and user is complicated in large cities while being intervened in its process, recognizing the users' needs is not as simple as it used to be. Consequently, in the design process of dwellings, studying populations with similar characteristics, cultural or lifestyle determines the needs of future residents that should be studied carefully. It is also said that human scale of cities and as a consequence, citizen's satisfaction can be only achieved when an interactive dialogue between citizens arise in cultural, social and economic aspects of community (Taban, Vasiq, & Keshtkar Ghalati, 2008). Ghasemzadeh (2010) emphasizes on the importance of considering qualitative and functional expectations of users in order to provide adequate rooms and spaces for various lifestyles. According to Azizi (2004), indicators of planning habitats are categorized in three groups; economic, social and physical. All these classes greatly emphasizes on the planning and design process. However, Poordeihami(2011) believes that designing a residential environment which responds to the needs of its dwellers has to be based on recognized characteristics of its users, and their culture. It is also observed that the residents who are more satisfied with living in apartments are those who are less adhered to traditions (Jahangiri, Lehsaeizadeh, & Mansourian, 2006). Kamalipour, et al.(2012) classify and evaluate effective predictors increasing place attachment into two groups; physical (rootedness) & social (bounding).

In the third group which focuses on studying the historical, social and cultural dimensions of housing in Iran, Aeinifar(2003) emphasizes on flexibility of dwelling environment, as one of the key concepts in fundamental formation of Iranian residential architecture.Pirbabaei& Sajjadzadeh(2011) discuss place attachment to be the intersection point of physical elements, mental concepts of space and social structures and illustrate that the group belonging to traditional neighborhoods of Iran is such strong that highly affects their perceptions of identity as well as their attachment to the place.Lately, Mahdavinejad & Mansouri(2012) emphasize on cultural myths, social believes, and historical behaviors to be essential factors in traditional Iranian architecture.

3. Method

As Gifford, Hine, Muller- Clemm, & Shaw(2002) mention,experts and laypersons do not assess the built environment in the same way but it does not mean that lay assessments are less important than expert assessment. Thus, a survey is conducted here to assess how Tehran apartment residents prefer their dwellings to be promoted in social and cultural aspects.

In examining the previous studies mentioned in the literature review of this article, seven concepts have been developed to be studied among a group of apartment residents in Tehran. All of them are improvement ideas for condominiums to promote the social and cultural aspects of sustainable urban development. They are intended to promote residential satisfaction and quality of life in Tehran, and are mostly applicable to other growing cities of Iran. Table 2 illustrates the relationship of improving concepts with the theoretical foundations of the study.

The suggested improvement plan concepts are categorized in three main foundations: social participation, social facilitation and saving the cultural diversity- aspects of Iranian culture.

To promote social facilitation, two concepts are suggested: providing seating and convenient facilities in semi-private or semi-public spaces and using sound insulation materials in common walls and roofs between units. space. And third suggestion is to design non street-facing balconies for every apartment which may allow access to private open space.To promote social participation of the residents, three concepts of building plan were studied: First, considering the variety of plans may enable the residents to choose the plan that suits their lifestyle. Secondly, designing green roofs or balconies in multiple floors which are shared between nearest neighbors may allow them to access to private or semi-private open. Concerning the cultural issues in current condominiums of Tehran, two concepts are developed here; first, designing closed kitchens instead of the so-called "Open Kitchens" which may allow the residents to freely do the Iranian culinary way of preparing foods so as not to worry about food aromas and the temporary messiness in the kitchen. The second concept is to design a communal hall in the condominium. Such shared space may solve the problem of insufficient gathering space in apartment units. According to the authors' observation, usually one communal hall will respond to the cluster dwellers of 12 or fewer units in the building and if they become more in number, then there is a need for another hall for every 10 to 12 units. These seven concepts are studied in two stages: an exploratory study and the questionnaire survey.

Table 1
Relationship between Improving Concepts and Theoretical Foundations, authors.

		Theoretical Foundation	Design Promoting Concept
Promoting Quality of Life / Promoting Residential Satisfaction / Promoting Place Attachment and Place Identity	Social Facilitation	space for desirable social activity	Seating and convenient Facilities in semi-private Semi-public spaces
		increase the chance for neighbors to meet	
		convenient space for expanded social interaction	
		increasing residents' privacy	using sound insulation materials in common walls and roofs
	Social Participation	preventing the sense of social exclusion and increasing the possibility of making choices even for low income people	variety of plan designs with different floor areas
		safe and controlled open area for children to play in	green roofs or balconies in multiple floors, shared between residents
		increasing cooperation and joint activities between neighbors	
		access to private or semi-private open space, especially for women with legal clothing restrictions	designing non street-facing balconies
	Saving Cultural Diversity-Aspects of Iranian Culture	convenient space for performing Iranian cuisine	designing closed kitchens
		providing responsive space for residents to celebrate cultural occasions	a communal hall for a maximum of every 10 to 15 units

(Source: The Authors)

Exploratory Interview

An exploratory interview was conducted. The first purpose of this stage was to examine if people better respond to visual tools or written questions. The second aim was to develop the suggestions using the recommendations made by current apartment dwellers to understand their preferences and elicit their perceptions. The interview also enabled them to share ideas among one another. Twelve people who have been living in apartments for at least five years are partly involved in the investigation. They were chosen to a span a wide age of 24 to 60 years old.

The interview was conducted in two days, lasting for almost 4hours every day. On the first day, the visual and verbal methods were used. The questions in this panel were some plans and interior perspectives, illustrating the recommendations in promoting the social and cultural aspects of apartments. The slide son a screen was shown to the participants at the same time were given papers indicating picture numbers to rate their desirability from 0 to 5 and been able to write a reason for their choice. In addition, the pictures were verbally explained to them in order to examine their own ideas, recommendations and preferences.

On the second day, the written questionnaires with open-ended questions were used and once again the participants were allowed to share their ideas. The questionnaires consisted of seven recommendations so that the participant could rank the desirability of each question by

Rating them from 0 to 5. A blank area was also considered for the participant to write the reason for his/her choice. In addition to this type of questions, two open-ended questions were asked at the end of the questionnaire; what are your social and cultural concerns in your current residential environment? What do you suggest to solve these issues?

The interest that the study group showed during the panels was surprisingly high. On the one hand, considering the first purpose, the research shows that using visual tools caused the participants to be distracted from the relevant to irrelevant things in the pictures such as furniture, colors, graphics, and materials. However, they responded better to written questionnaires and focused on the main points. But then again, for the second purpose, the recommendations were developed through three considerations; people could not share their thoughts and preferences in both methods, two open-ended questions were used in the second panel and the blank area was left under each question.

3.1. Questionnaire Survey

According to Tehran MOICT(2011), the residents of Tehran are distributed in 8% neighborhoods with more

than50.000.000 IRRs value per sqm, 30% in neighborhoods with 30.000.000 IRRs to 50.000.000 IRRs per sqm and the rest settle in less than 30.000.00IRRs per sqm. It aimed to choose the study participants according to the mentioned distributions, consequently the main survey was conducted in 300 people who have been randomly selected from three various neighborhoods of Tehran: 24 residents of Fresheth, 90 from Pasdaran and 186 people from Khaniabad.Fereshtehis one of the wealthiest neighborhoods in Tehran where the mean value of an apartment unit per square meter is 15.000.000[1] IRRs[2].Pasdaran neighborhood settles the average income of people in Tehran where the mean value of an apartment unit per square meter is 70.000.000 IRRs and Khaniabad is a neighborhood that the mean value of an apartment unit per square meter is 20.000.000 IRRs in it. The data from the 295 residents were used for analysis since about 5 participants left too many questions unanswered. The main survey was done between March 12nd and April 10th.

The questionnaire is categorized in two main parts, Social-Demographic Characteristics and Improving Concepts, while the first part had two subcategories; General Information and Housing information.

In terms of general information, the participants were asked general questions, i.e. gender, age, education and number of family members. In housing information they were asked about the experience they had during living in apartments, i.e. length of residency, the unit's type of kitchen first time as one moved in, condominium stories, and total apartments. In addition, two questions were asked about how they rate their level of communication content intimacy with their neighbors and how interested they are in promoting this relationship.

In the second category, improving concepts, seven mentioned concepts were investigated by asking them to rate their level of interest with each concept from "very attractive" to"very unattractive "while

they could also choose "neutral". A blank area also was left for them to write the reason of their choice, and multiple reasoning was allowed.

4. Results and Analysis

Table 2 shows the Distribution of respondents' social-demographic characteristics. The results illustrate that gender is almost equally distributed. Age, education and number of family members are also comparatively well distributed. However, most of participants have 2 and 3 family members. Responses to housing information questions show that most of the participants have lived in apartments for more than 11 years. Collected data illustrate that the dwelling of most of respondents has 4 to 7 stories while there are almost equal participants from apartments with 8 to 10, 11 to 13 and more than 13 stories. The numbers of

Respondents that reside in condominiums with various numbers of units are comparatively well distributed whilst most of them are from condominiums with 9 to 12 and more than 24 units.

Predictably, the vast majority of residents (97.97%) stated that their units had open kitchens at first time they moved in and just less than 2.03% had closed kitchens. This was considered as a cultural problem in Iran.

Collected data (Table 3) show that there is very low level of intimacy between the neighbors in dwellings however, the participants are strongly interested in promoting their social relationship with their neighbors.

4.1. The concept of "seating and convenient facilities in semi-private or semi-public spaces"

The participants showed considerably high interest in the concept of "seating and convenient facilities in shared spaces of the cluster". (Figure 2)

The study group that mentioned the reasons of their choice is shown in Table 3. In analyzing their cited causes, the highest stated reasons were the preference to interact with neighbors and the need to a space to meet their guests whom they refuse to invite into their units.

A low percentage of participants (almost 16%) rated this concept as unattractive or very unattractive whilst most of them were worried about the management difficulties as well as disturbing noises.

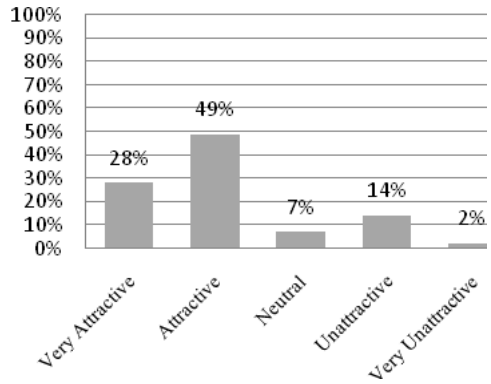


Fig.2. Participants' interests to the concept of "seating and convenient facilities in semi-private or semi-public spaces", (Source: The Authors)

4.2. The concept of "using sound insulation materials in common walls and roofs between units"

The vast majority of respondents (91%) showed high interest in using sound insulation materials in common walls and roofs and this result confirmed the problem of lack of privacy in the current housing form in Tehran. The distribution of desirability of this concept among participants is shown in Figure 3.

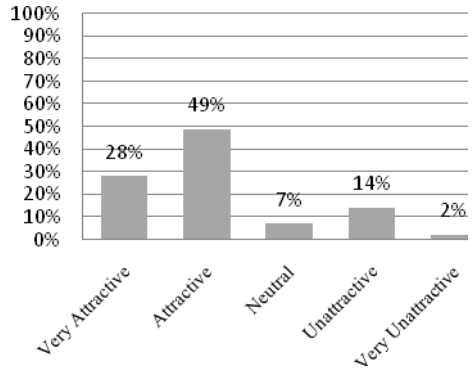
[1] Currently 1USD is equal to 31,459 IRRs.

[2] Values per sqm are obtained from database of Ministry of Industries and Business.

Table 2
Distribution of Respondents' Social-Demographic Characteristics

Questionnaire Part	Characteristics	Attribute	n	%
General Information	Gender	Male	145	49.15
		Female	150	50.85
		Total	295	100.00
	Education	Elementary	55	18.65
		Middle	65	22.03
		High	75	25.42
		College and Higher	100	33.90
		Total	295	100.00
	Family Members	1	37	12.54
		2	99	33.56
		3	102	34.58
		4+	57	19.32
	Age	18 to 24	72	24.41
		25 to 40	107	36.27
		41 to 60	61	20.68
		61 and more	55	18.64
Housing information	Length of Residency in Apartments	Under 10 years	47	15.93
		11 years and more	248	84.07
	The Unit's Type of Kitchen First Time One Moved in	Open Kitchen	289	97.97
		Closed Kitchen	6	2.03
	Apartment Building Storey's	4 to 7	122	41.36
		8 to 10	56	18.98
		11 to 13	57	19.32
		13+	60	20.34
	Total Units in Apartment Building	4 to 8	54	18.31
		9 to 12	93	31.53
		12 to 24	64	21.69
		24+	84	28.47
	Point Given to One's Level of Intimacy with Neighbors (from 0 to 5)	0	135	45.76
		1	123	41.70
		2	23	7.80
		3	9	3.05
		4	5	1.69
	Point Given to Willingness to Promote Social Relations with Neighbors (from 0 to 5)	0	23	7.80
		1	32	10.85
		2	61	20.68
		3	103	34.91
		4	76	25.76

(Source: The Authors)
***** Participants were allowed to mention multiple reasons for their choice.



Fige 3. Participants' interests to the concept of "using sound insulation materials in common walls and roofs **(**Source: The Authors)

In examining the positive reasons cited for this concept (Table 5), most of them could be categorized in terms of increasing the privacy of residents. As can be
Seen from the data shown in Table 5, the small proportion of respondents who were not interested in this concept, were mostly afraid of feeling lonely when they do not hear their neighbors making noises.

Table 3
Responses to the concept of "using sound insulation materials in common walls and roofs"

Responses to the concept of "using sound insulation materials in common walls and roofs"					
Positive Causes n=278	f	%	Negative Causes n=49	f	%
It will increase my privacy	211	76	I will feel lonely while I don't hear neighbors making noises	11	65
I will no more hear my neighbors arguments	197	71	It will increase the construction fees	6	35
I won't be worried anymore about making noises during various hours of the day (partying, using noisy home appliances, etc.)	139	50	I don't have any problem with noises	5	29
Children can play more freely	101	36	The apartment unit will be more expensive	3	18
I can watch TV until late night	39	14	I enjoy listening to children playing	3	18
Various Reasons	23	8	Various Reasons	2	12

(Source: The Authors)
*Participants were allowed to mention multiple reasons for their choice.

4.3. The concept of "variety of plan designs with different floor areas"

A relatively high proportion of participants (71%) rated the concept of "variety of plan designs with different floor areas" as a desirable concept. Figure 4 compares the rates for the attractiveness of this idea among the respondents and as can be seen the lowest level belongs to "very unattractive" (7%) while the rates of "neutral" and "unattractive" answers are equal.
Table 4 demonstrates the positive and negative reasons that the participants stated for their choices. On the one hand, the most positive cited reasons were enabling them to choose the most suitable plan for their lifestyle; the feeling of self-worth with such feature give them and decreasing the future costs the residents have to pay for changing the plan to suit their lifestyle. On the other hand, a small number of participants cited negative reasons; mostly they said they were not interested in making selections from many choices.

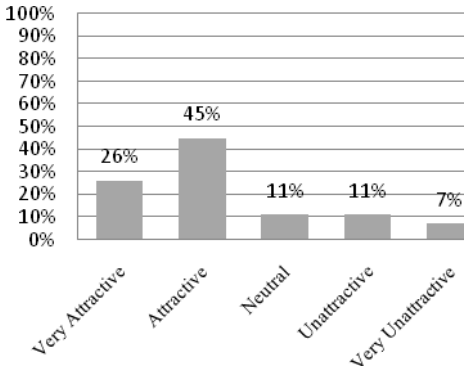


Fig. 4. Participants' interests to the concept of "variety of plan designs with different floor areas", (Source: authors)

Table 4
Responses to the concept of "variety of plan designs with different floor areas

Responses to the concept of "variety of plan designs with different floor areas"					
Positive Causes n=241	f	%	Negative Causes n=54	f	%
I can choose the suitable plan for my life style	103	43	I don't like to select from a wide range of choices	31	57
I will feel as my right has been considered by the society	99	41	It will cause gathering people with various lifestyles in a building and may cause cultural conflicts	22	41
I will feel more attached to the apartment	96	40	I won't choose the last remaining unit because I think the sold ones were better	13	24
It will decrease the future costs for changing the plan	61	25	It will cause management difficulties	12	22
Various Reasons	52	22	Various Reasons	10	19

(Source: The Authors)
*Participants were allowed to mention multiple reasons for their choice.

The concept of "green roofs or balconies in multiple floors, shared between residents"

The results show that the idea of "green roofs or balconies in multiple floors which is shared between neighbors" was very attractive or attractive for68% of participants, neutral for merely 9% and unattractive or very unattractive for 23% of the residents (Figure 5).Apparently, this concept was rated desirable by the majority of participants.
According to Table 7, the most cited positive reasons were increasing the residents' chance of meeting one other as well as to enhance their connection with green space. However, a small proportion of participants were neutral or uninterested in this concept, their cited reasons should be considered; they were mostly worried about management difficulties and the extra costs that such space will probably be imposed upon them.

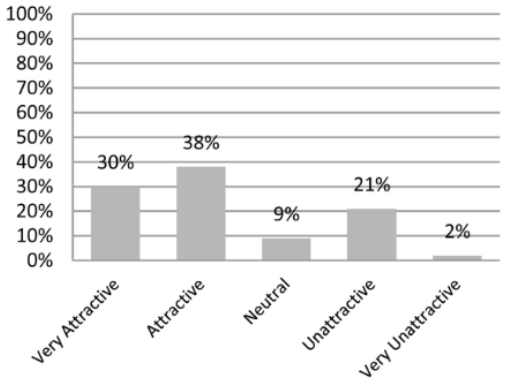


Fig. 5. Responses to the concept of "variety

Of plan designs with different floor areas"
(Source: authors)

Table 5
Responses to the concept of "green roofs or balconies in multiple floors, shared between residents"

Responses to the concept of "green roofs or balconies in multiple floors, shared between residents"					
Positive Causes n=227	f	%	Negative Causes n=68	f	%
I will have social interaction with my neighbors	107	47	It will be expensive	43	34
I will have the chance to enjoy a green space while living in an apartment	95	42	It will cause management difficulties	34	28
Children will be able to play in an open area while it is secure and safe	62	27	It will be time consuming to take care of a garden	23	34
I can teach my children to be responsible	25	11	It will cause conflicts between neighbors	21	31
Various Reasons	11	5	Various Reasons	6	9

(Source: authors)
*Participants were allowed to mention multiple reasons for their choice.

4.4. The concept of "non street-facing balconies"

As can be seen from Figure 6, a high proportion of participants (77%) were enthusiastic about the concept of "non street-facing balconies", while merely 5% were neutral and 18% were not interested at all.

The highest rate of the positively stated reasons belongs to the chance that such space gives the Iranian families the opportunity to use it with less privacy concerns. The next cited reasons were mentioning the various functions that such space would provide the residents with; barbecuing or any activity that is impossible to do in balconies that

face the street because of the changes they will make to the building elevation. Table 8 demonstrates the variety of positive and negative responses that the participants stated during the survey.

Among the negative responses, the participants were mostly worried about the unwanted changes that their neighbors might make which would damage their view.

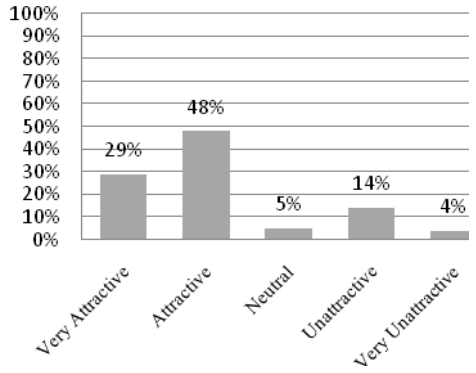


Fig.6. Participants' interests to the concept of "non street-facing balconies",(Source: The Authors)

Table 6
Responses to the concept of "non street-facing balconies", authors.

Responses to the concept of "non street-facing balconies"					
Positive Causes n=221	f	%	Negative Causes n=74	f	%
Ladies can use the open area with less clothing restrictions	142	64	It will become a storage	31	42
I can barbecue there	74	33	It will cause conflicts among neighbors	23	31
I can decorate it on my own	45	20	What is the point of a balcony which doesn't provide a good view	21	38
I can use it while not being worried about changing the building's appearance	31	14	What if a neighbor was untidy	15	20
Various Reasons	13	6	Various Reasons	10	14

(Source: The Authors)
*Participants were allowed to mention multiple reasons for their choice.

4.5. The concept of "closed kitchens"

The two final concepts are designed to promote the cultural aspects of apartment residences in Iran. The results are somehow different in the concept of "designing closed kitchens". On the one hand, the positive reasons cited by the respondents (Table 7) affirm the authors' main purpose for this concept. A majority of them (85% of positive reasons) stated their preference to cook Iranian recipes in a closed kitchen. Surprisingly, in addition to these positive aspects, some participants mentioned that the closed kitchens gave them a sense of nostalgia. However, at least a small group of them stated the benefit of more private space they might be given by closed kitchens.

On the other hand, the most stated negative reasons were "the possibility of communicating with others in an open kitchen" and called "the closed kitchens outdated".

The results shown in Figure 7 demonstrated that almost half of participants (46%) were interested or very interested in this idea, 14% were neutral and about one-third of them(28%) were uninterested and the remaining 12% found the idea very unattractive. It can be seen that the concept of "closed kitchens" received almost equal interested and uninterested respondents whilst merely 14% had no idea.

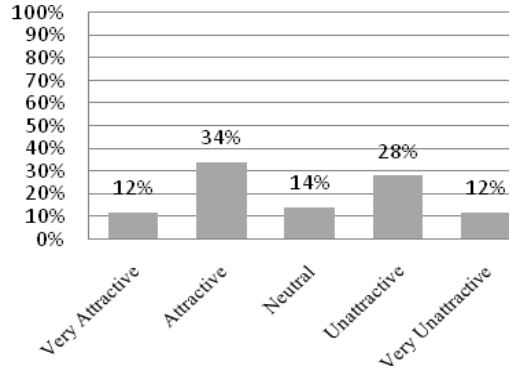


Fig.7. Participants' interests to the concept of "designing closed kitchens", (Source: The Authors).

Table 7
Responses to the concept of "designing closed kitchens"

Responses to the concept of "designing closed kitchens"					
Positive Causes n=178	f	%	Negative Causes n=117	f	%
I will not be worried about the scent of Persian foods	152	85	I prefer to communicate with others while I'm cooking	96	82
I won't be worried about untidy kitchen when I have guests	62	35	Closed kitchens are out-of-date	89	76
I will l					
Closed kitchens are nostalgic	22	12	With the open kitchen the apartment will appear larger	52	44
Various Reasons	12	7	Various Reasons	8	7

*Participants were allowed to mention multiple reasons for their choice.

(Source: The Authors)
*Participants were allowed to mention multiple reasons for their choice.

4.6. The concept of "a communal hall for a maximum of every 10 to 15 units"

This idea is the second one that concentrates on the cultural issues to save some aspects of Iranian culture. The attractiveness of this concept were considerably high Among the participants (81%) while almost 5% of them were neutral with the suggested idea and 14% of the participants were not interested in the concept. It can be seen from the Figure 8 that the concept of "the communal hall" which is suggested to facilitate cultural celebrations among Iranian apartment residents was interestingly attractive for the survey respondents.

Table 8 demonstrates the distribution of positive and negative responses. Studying the positive reasons shows that a vast majority of participants cited the gathering privileges they are given by having a communal hall in their condominium.

In the case of the negative reasons stated by the survey participants, most of them were worried about management difficulties and scheduleconflicts among the apartment owners. There were also a number of people who were concerned about the extra costs which might be imposed on the building management by having a communal hall.

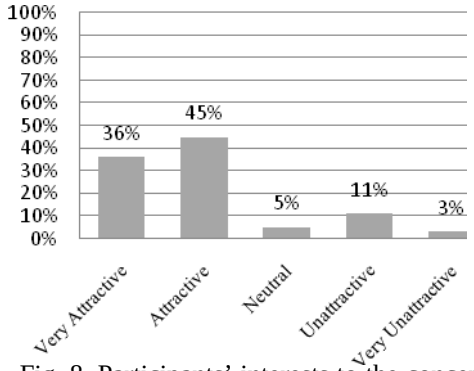


Fig. 8. Participants' interests to the concept of "a communal hall for a maximum of every 10 to 15 units", (Source: The Authors)

Table 8
Responses to the concept of "a communal hall for a maximum of every 10 to 15 units"

Responses to the concept of "a communal hall for a maximum of every 10 to 15 units"					
Positive Causes n=255	f	%	Negative Causes n=40	f	%
I can celebrate cultural and religious occasions with my family and friends	171	67	Neighbors will have conflicts in planning the use of such space	23	58
It facilitates celebrating family reunions	122	48	Managing will be difficult	21	53
I will not be worried anymore about my small apartment and lots of guests	91	36	It imposes extra costs to the building	15	38
It facilitates partying	71	28	I do not need extra communal space	8	20
Various Reasons	9	4	Various Reasons	6	15

(Source: The authors)
*Participants were allowed to mention multiple reasons for their choice.

5. Conclusion

Most of the results of the study illustrate that the seven suggested concepts are rated interestingly favorable by the survey participants.

The first concept is to design seating and convenient facilities in semi-private, semi-public spaces, which is viewed favorably highly by the survey participants. Semi-private or semi-public spaces in a condominium are mostly considered as corridors, lobbies and other areas that are shared among residents and can be socially improved by designing convenience of specific facilities within them. This feature may be even more favorable if it is combined with a good view to the open areas as well as making it more attractive by creating beautiful floral arrangement and greenery visible. As a social facilitation concept, this idea may bring the cluster residents together and improve their social interaction. In addition, this may promote place attachment.

In case of the second concept to promote social facilitation, using sound insulation materials in common walls and roofs is proposed to provide apartment residents with higher privacy. Predictably, this idea is highly accepted by the participants. It affirms that apartment residents in Tehran are seriously worried about their privacy at the same time having problems hearing their neighbors making noises. Based on the authors' personal experience and what can be understood from previous studies shows traditional Iranian houses are mostly introverted in their plans (Mahdavinejad & Mansouri, 2012), Iranian people are more likely to be obsessed with privacy concerns. However, there were a small proportion of participants who were worried about feeling alone when they do not hear their neighbors making noises. This concern will be solved if the other features are applied in improving the residents' social interactions. According to the results, this concept is suggested to become a policy for the late development of condominiums in Iranian cities and oblige constructors to use sound insulations in common walls and roofs between units. This idea may improve the residents' privacy and eventually they will be more satisfied with their dwellings.

The next concept is in the category of promoting social participation among the apartment residents of Tehran. It is suggested to design various plans with different floor areas to cover the different lifestyles. This concept is mostly attractive or very attractive for the survey participants. However, the negative respondents might be convinced by understanding how satisfying it would be if the plan matched their lifestyle. A variety of plans in a building may impose higher costs to the builders but such investment will result in the decrease of future costs of making changes in the building plan. This idea will provide people to choose the plan which best suit their lifestyle, promote place attachment so that there will be a close identity between them and their dwelling.

As previously mentioned, the lack of private green space for the apartment residents in Tehran is a concern. The authors suggest designing green roofs and balconies shared between residents to solve this issue and a high proportion of the participants found it favorable. This concept will bring neighbors together, as an idea in obtaining social benefits from participation, whilst improving their relation with green space and positively affect their psychological state. Another considerable aspect of this concept is its undeniable effect on mitigation of the urban heat islands as well as decreasing air pollution in the city. Such open space may provide children with a safe open area to play in. This space is closer to the apartment unit than the common shared courtyard of the building which is usually multiple floors lower than the units and cannot be easily supervised by the parents. Accordingly, another benefit of this concept is to diminish the negative consequences of living in apartments for the children. However, the respondents' negative assessments of this ideawere mostly worried about the maintenance costs and management difficulties. Such cited issues might be solved by the appropriate design process of the building; i.e. by choosing the plants that are more compatible with the climate, implementing technologies that collect rainfall for irrigation or other green ideas that facilitate manageable gardening.

The authors consider Iranian families' privacy concerns which causes the problems in using private balconies or open spaces that face the street. For such an issue, non street-facing balconies for the apartment units were suggested. This idea was highly favorable for the participants. The most cited reasons for the participants' choices confirm the main purpose of suggesting this concept. However, there were also more benefits stated for this concept by them. This space can also be decorated by the residents, as they desire, and accordingly will increase their attachment to the place.

The idea of designing closed kitchens instead of the very common open kitchens in apartment units is equally responded by positive and negative viewpoints from the participants. Lastly, it is understood that the participants' preferences in the case of closed or open kitchens are depended to their lifestyles. Accordingly, the concept of providing closed kitchens can be seen as an option in designing various plans within a condominium. Accordingly, this choice enables people to select it if it matches their lifestyle. As a consequence, apartment residents can prepare Persian cuisine more easily and this helps the Iranian culture to survive and pass on to the next generations.

With the last concept, designing a communal hall for a maximum of every 10 to 15 units is suggested and it is viewed favorable mostly by the majority of survey participants. As a high proportion was cited by them, this idea may give the privilege to apartment residents to celebrate cultural and religious ceremonies. However, this concept is aimed to promote cultural aspects in the condominiums; this will bring social benefits for them by facilitating the residents to gather together more easily with their friends and family. Consequently, the problem of inadequate space in apartment units will be diminished. In case of negative responses to this concept, such problems can be solved by appropriate management in both the design and construction process of the building.

To conclude, while living in apartments seems unavoidable in Tehran, the mega-city capital of Iran, considering this study's improvement ideas will promote place attachment and place identity in apartment residences. As a consequence, residents' satisfaction of their dwelling will be improved and their quality of life will grow.

Although this study is conducted in a group of apartment residents who are from the neighborhoods with the same distribution as the whole city dwellers, the results may become more accurate if it is done in a larger scale of participants.

However, from a larger scale point of view, using these concepts in designing future condominiums in Tehran,

may also promote the social and cultural aspects of sustainable urban development.

This study was held in Tehran, the social concerned results could be applicable to any other city, whilst the cultural concerned conclusions were thought to be applicable to any other growing city in Iran. However, regional climatic considerations should be considered since Iran is a country with a wide range of climates.

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