A Study on the Effect of Spatial Desirability of Collective Arenas in Residential Complexes on Women's Social Empowerment[*]

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Abstract

Any activity, social action, and conversation for women require opportunities for being present in all social arenas. The collective arenas of residential complexes are the most important arenas that provide appropriate opportunities for activities and increase the personal and social capabilities of women. The suitable design of these arenas according to attitudes and needs by overcoming barriers to attendance provides a suitable context for social participation, increasing social capital, and empowerment of women. The present research investigated the effect of architectural space on the social empowerment of women in collective arenas of residential complexes. The research aimed to answer the question of how the improvement of the spatial quality of residential collective arenas is effective in the social empowerment of women. To this end, the research was conducted in three stages: First, the content analysis of social sciences based on women's social empowerment. At this stage, the two factors, increasing the social capital of women and being in the public space, were the most important factors in the social empowerment of women; second, the modeling of factors obtained from the factor analysis of the users' questionnaires, in which the statistical population consisted of 200 women living in four residential complexes in Tabriz City. Based on the results of this stage, the architectural design of cultural and religious spaces in residential complexes was a physical-environmental factor that created and expanded many communication networks leading to higher social capital of women and space presentability for them. Third, the comparison of results obtained from previous stages of the research. The final model indicated that effective environmental factors in improving the spatial utility of residential collective arenas(play effective roles in increasing the social capital of women and space presentability and they were the main components of women's social empowerment (based on the results of the first stage). Therefore, improving the spatial utility of the collective arenas of residential complexes by increasing the social capital of women and their presence in collective arenas is effective in women's social empowerment.

Keywords: Collective arenas, Residential complexes, Social empowerment, Spatial desirability, Women

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1. Introduction

The social experts' recent studies indicate that achieving sustainable development is not possible without women's active participation in all familial, social, cultural, and economic arenas, but several factors limit women's active presence in society. Therefore, the term "gender and development" was used instead of the term "woman in development" in the 1980s, and then the third-world countries proposed many strategies for women's active presence and participation in society. Women's empowerment is one of the most important strategies. Therefore, in addition to social and psychological sciences studies on women's empowerment and the large scope and importance of the issue and the importance of interdisciplinary studies, it seems necessary to conduct studies in other fields and investigate the effects of other science fields on women's empowerment.

Any activity, social action, and dialogue for women require opportunities for their presence in all social, economic, cultural, and political fields. The spaces have high presentability quality for women (By attending such spaces, women engage in social interactions, get to know each other as much as possible, and realize their potential abilities and those of others, and it underlies the creation of self-confidence, and ultimately, the establishment of small groups and organizations and the gathering of women's powers and empowerment, and thus women will be empowered to control resources and environment [1]. The low quality of public spaces and lack of attention to women's needs, perceptions, and preferences in designing urban spaces decrease women's presence in these spaces. Even though women's experience of understanding the public space in urban areas is different from men, there is no comprehensive study on the identification of perceptual differences and preferences in women in public spaces in terms of physical indices and women's relationship with the environment, in addition to gender differences, but urban public spaces are much more effective in women's daily life than men [1]. Neglecting this issue can cause a gradual reduction in women's presence in urban spaces, and finally, negatively affect their cultural and social activities [1].

Therefore, women need spaces and arenas to present themselves and improve and develop their capabilities. Collective arenas of residential complexes are the first spaces where women can easily and for a long time be present (due to proximity to the place of residence and availability). The collective arenas of residential complexes are suitable contexts for activities and increasing women's personal and social capabilities. The proper design of these arenas according to women's attitudes, needs, and interests and removing the barriers to their presence provides a suitable context for increasing their solidarity and social participation, and ultimately enhancing their social capital which is a prerequisite for their social empowerment.

The collective space is an opportunity to get rid of tensions of everyday life, spend leisure time, creation of social interactions, the gathering of different people and groups, and a platform for their presence, freedom of speech, and expression in the space. Collective life in public spaces relies on promoting social interactions, attracting different people and groups, social security, and thus encouraging the increase of tolerance of different groups in the space, more sociability, and the creation of a dynamic and lively space [2]. The creation of suitable collective spaces provides the basis for improving social interactions, increasing the participation of all classes of society, and increasing the social solidarity of people, leads people towards the community in an era when employment and residence are based on individuals, and deepens the connection between human and the environment. Given that the women's activity model relies more on collectivity and inclusiveness than individualism, it is essential to provide an optimal design of collective arenas according to the needs and attitudes of women as half of a country's population with important and effective effects on sustainable development. According to the above mentioned, the importance and role of the architectural space quality in the presence of women and the relationship between their presence and their social empowerment have been studied and these questions have been raised that: 1- what are the effective physical and environmental components in improving the spatial desirability of the arena? What are the collective advantages of the residential complexes from the women's perspective? 2- How is improving the residential complexes collective arenas spatial quality effective in the women's social empowerment? Also, this

research aims at prioritizing the effective design components in improving the spatial desirability of collective arenas of the residential complexes that can improve the women's social empowerment.

2. Literature review

The research literature was reviewed in two main fields: 1-1- Investigating effective environmental factors in improving the utility of urban public spaces and collective arenas of residential complexes, and 1-2- Social empowerment of women. The results of some studies are as follows.

2.1.Investigating effective environmental factors in improving the utility of urban public spaces and collective arenas of residential complexes

There is an increasing trend of women's presence in workplaces. The city's body and structure, and the collective areas of residential complexes as subsets of the city, are the first places for women's presence after house, and thus they must respond to their extensive presence in different spaces and arenas of residence, work, and transportation. Some domestic and foreign studies have investigated desirable spaces from the perspective of women in urban public spaces. The following table presents some of the most important studies.

Table 1: Classification of women's preferences, needs, and perceptions in urban spaces in terms of physical and aesthetic issues of the environment derived from theoretical studies (author)

Theorists	Women's preferences, interests, and needs
[1]	The evaluation of urban public spaces for women resulted in four criteria, namely access and communication, environmental comfort and legibility, social interactions, and types of land use and activities
	Components of environmental quality in four main factors: 1- Physical factors (form, space, and texture design dimension), 2- Physical factors: (urban furniture, facilities, and equipment dimension), 3- Aesthetic and visual factors (cleanliness, greenness, lighting, and views), 4- Perceptual and emotional factors (comfort, relaxation, vitality, identity, and legibility)
	The results of evaluating the quality and diversity of activities for the presence of women in public spaces were as follows: 1- Care in the space and access to help, 2- Round-the-clock life, 3- Proper access to the space, 4- Variety of uses
PPS	The desire to have more insight and awareness about the space where they are present. A better understanding of comfort and imagination of space. Women's strictness about the spaces which they want to use. The high number of women among the average users of the space is a good indicator to measure the space's success.
Identifying the needs and problems of women in District 19 (2010)	The importance of meeting the women's needs about urban furniture, street lighting, installation of sitting places, installation of garbage bins, and...
[3]	Considering the physical conditions and body dimensions of users, especially women. The proportionality of space dimensions and urban furniture can play an important role in providing mental peace for women. Women choose a good place with the help of their sensory abilities and intuitive understanding. Women's perception is higher than men's about the safety and security of the space and choosing a place to sit according to its height and physical characteristics.
[4]	Way-finding and accessibility, ambiguity, security, comfort, dynamism and attractiveness, harmony with nature, event acceptance (religious, sports, social, and cultural events)
[5]	The main needs of women in public space: Personal safety, health facilities, care, and transportation equipment for children and the elderly, and shopping
[6]	Decoration in the space is a case of the inclusion of women in men's space, and the decorated spaces are related to women's characteristics. Femininity is associated with initiative and cleverness.
[7]	The level of the day and night security, being a part of the environment; responding to the needs of children, and the presence of drinking water and parks, retails, post office and commercial use are very effective in women's presence in the urban space. Inadequate physical conditions of the space reduce the level of social activity of single women in the neighborhood.

	There is a significant relationship between comfort and aesthetics, and suitable dimensions of the space with the level of presence in the neighborhood.
[8], [9], [10], [11], [12], [13], [14]	Obstacles to women's presence in urban spaces include the feeling of insecurity and lack of safety in the space, inappropriate flooring, unpleasant landscaping, too much solitude of the space, inappropriate lighting, illegibility of the environment, the lack of social monitoring of the space, low sense of belonging and the lack of a suitable public transportation system, overcrowding of riders and pedestrians, and the encroachment of riders into the area of pedestrian traffic, the unpleasant history of being in the city and previous memories, low neighborhood relations, etc.

The examination and analysis of studies on theoretical bases of spatial features and design components of spaces from the perspective of women, which are mentioned in the results of studies by the majority of experts, indicated the following cases: Security, environmental safety and surveil lability, accessibility of spaces, arenas of territories, suitable lighting of spaces, flexibility of furniture and spaces, variety of furniture, variety of colors, variety of materials and textures, vegetation and natural elements, diverse landscapes, cleanliness of the environment, proportions and human scale, sports and recreation for women, attention to environmental details and attractions, the playability of the space for children, walkability, the event ability of the space (religious, cultural, sports, and social events), inclusiveness (the space response to all age and gender groups), visual order, appropriate density, reduction of congestion and noise pollution, multi-functionality of the space, variety of commercial-service uses, active use of space, spaces for pause, centers of gathering, establishing communication, and increasing social interactions.

The doctoral thesis by the first author of the present manuscript was another study that examined effective environmental factors in improving the spatial utility of collective arenas of residential complexes. Based on its results, the environmental components affecting the spatial utility of collective arenas from the users' perspective (women living in residential complexes) were identified in seven factors, safe territory, space presentability, environmental comfort and natural factors, flexible sociability of space, cultural- religious space, social capital, women's neighborhood, and belonging to the space, each of which included several design principles (Table 2). For example, the safe territory included public and private spaces, environmental safety, service commercial uses, various perspective and view, the flexibility of furniture, spaces, activities, and services, variety of colors, materials, and textures, and gathering centers and spaces. In other words, women consider these factors as effective factors in creating a safe territory as the main components for promoting space utility in collective arenas and residential complexes.

Table 2: Classification of design components as factors (factor analysis)

The first factor: Safe territory	The second factor: Space presentability	The third factor: Environmental comfort and natural factors	The fourth factor: Flexible sociability
- Arenas of public and private spaces - Environmental safety - Commercial-service uses - Diverse perspectives and landscapes - Flexibility of furniture, spaces, activities, and services - Variety of colors, materials, and textures – Centers and spaces for gathering	- Vitality - Suitable lighting for day and night - Gathering centers and meeting spaces - Women's joint sports and entertainment	- Sensory richness - Use of natural factors (a variety of greenery, trees, and water) - Use of soft and hard materials - Climatic comfort	- Desirable privacy - Multi-functional and active use of space - Space accessibility - Space visibility - Monitorability of space
	The fifth factor: Cultural and religious space	The sixth factor: Neighborhood social capital	The seventh factor: Belonging to space
	- The cultural similarity of the neighbors - Expansion of social ties and intimacy	- Satisfaction with the environment - Hygiene and cleanliness of the environment - Social order	- Active use of space - Vitality - Accessibility of spaces

Based on the results of this thesis, the final model of the effective environmental components in the spatial utility of the collective arenas of residential complexes was approved as follows.
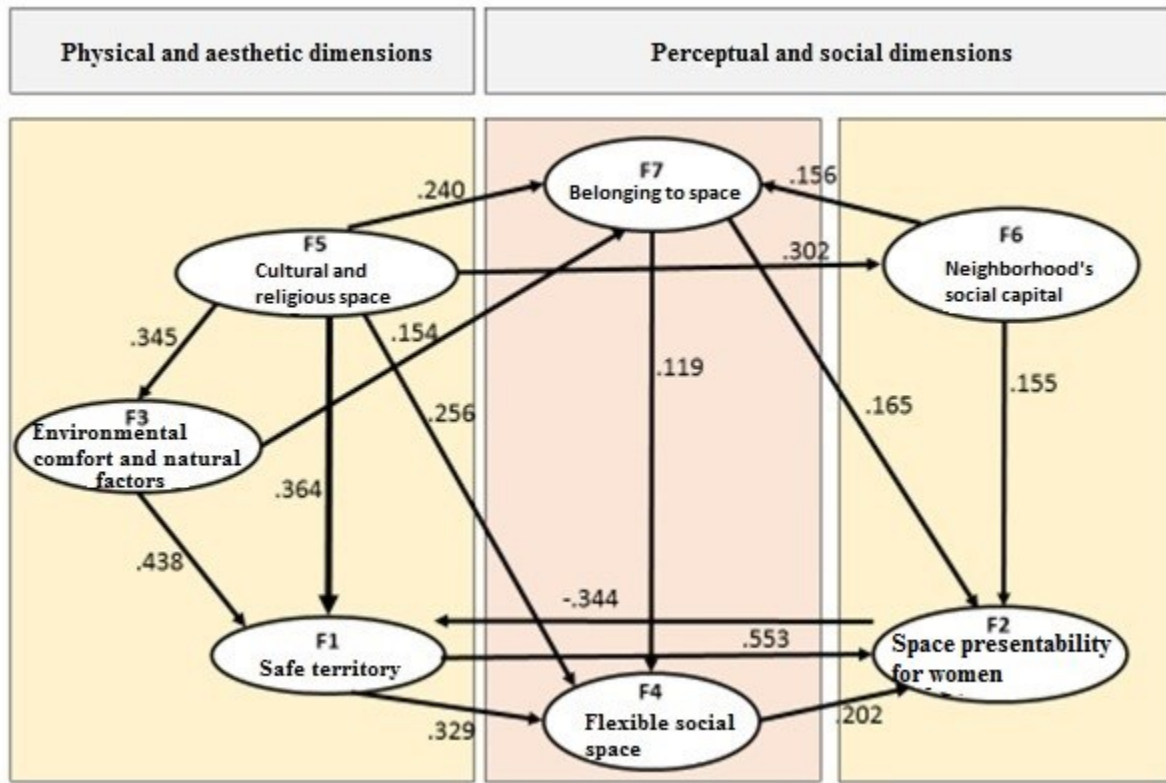

Figure 1: The final model of environmental components affecting the spatial utility of collective arenas of residential complexes (along with the path coefficient) [15]

In this model, "the design of cultural and religious spaces as a collective arena in residential complexes has a significant indirect effect on increasing the space presentability for women". In terms of architectural examples, cultural and religious spaces in residential complexes as behavioral centers establish an effective connection with people (women) and these behavioral gatherings become spatial places over time. The connection between a person in this space with the group and cultural and religious space leads to the creation of belonging to this space where they tend to stay and feel comfortable and safe. This space becomes meaningful and converts into a place for social communication in cultural and religious spaces that in turn lead to social spaces that bring women together in different social groups. Belonging to a place becomes a strong factor in the creation of many communication networks and the increase of social capital of the neighborhood and the expansion of women's social ties. These social connections provide the basis for the presence and occurrence of women's social activities in behavioral gatherings [15].

2.2. Social empowerment of women
The use of capacity and ability of all social groups constitutes a hidden dimension of participation. Studies by social experts indicate that it is impossible to achieve sustainable development without the active participation of women in all familial, social, cultural, and economic fields, but several factors limit the active presence of women in society. Therefore, the term "gender and development" was used instead of the term "woman and development" in the 1980s, and the third-world countries proposed many strategies for women's active presence and participation in society, one of the most important of which is women's empowerment. The concept of empowerment has been understood and applied as an ideal in promoting social health.

Empowerment refers to overcoming fundamental inequalities and the process of empowering people to dominate their choices and increase personal and social capital [16]. Social empowerment is a dynamic and comprehensive process [17]. The main aim of the empowerment process is to make suitable changes in all aspects of the lives of individuals, families, groups, and social strata [18]. Women's empowerment is a process during which women become aware of their needs and desires, strengthen the courage to achieve their goals through self-belief and self-confidence, and have the necessary ability to implement them [19].

Some studies on empowerment refer to the determination of women's empowerment indices and their participation in development [20, 21, 22; 23]. The most important foreign theories and studies were the theories of Lange, O'Hara & Clement [24,25] who focused on concepts such as participation, awareness, access to resources, education, and well-being. A doctoral thesis by Beigi [26] was another important study on women's empowerment and its role in the development of urban spaces and neighborhoods, confirming the effect of women's empowerment on neighborhood development. A few studies have pointed out the role of designing urban spaces and architectural spaces in empowering women [27,28].

2.3. The theoretical framework of research
2.3.1. The design of collective spaces and its role in the presence of women in public spaces
Humans are social beings who need physical and spatial places to establish their social interactions. The manifestation of this need in the city has led to the creation of collective spaces. Collective spaces are a part of the urban public space where social relationships and interactions are formed [29] .The creation of a proportional relationship between people and the bodies around them is the mission of designers and architects. To achieve this goal, the creators of space must have a correct understanding of human behavior in different environments to make the bond between human and place stronger.

Apartment living, few and small spaces for living, being far from nature and changing houses to dormitories require the use of public spaces. Modern houses with existing facilities and living conditions can meet many needs of traditional Iranian people. Furthermore, cutting from the ruling values of traditional societies based on a strong connection with nature and social interactions leads to dissatisfaction in long term. The need to have a complementary space next to the interior space of apartments to meet recreational needs, create a continuous relationship with nature on the one hand, and expand a part of the functions of the indoor space to the outside indicates the need to pay attention to the collective space. Furthermore, it is essential to pay attention to collective spaces as a place for interactions and increasing the presence of people and social security, as well as creating a sense of responsibility in residents towards their places of residence.

2.3.2. Indices of women's social empowerment
Based on studies on the theoretical bases of the subject, the effective factors of women's empowerment are summarized and developed in two general groups, namely intra-personal and extra-personal factors according to Table (3).

Table 3: Effective factors of women's empowerment

Intra-personal factors	Extra-personal factors			
Psychological [20]	Cultural and social factors [20]	Economic factors [20]	Political factors [20]	Environmental factors [15]
Increasing self-confidence, Self-respect, Intellectual independence, Feeling of satisfaction, No feeling of weakness,	Changing attitude towards women [20], Acquiring communication skills [20], Presence in public space [20], Participation in non-family gatherings [20], Social participation [20],	Gaining or increasing income Ability to repay the loan Increasing savings	Increasing political participation Fight for equal rights Fighting discrimination	Satisfaction with the place of residence (increasing women's participation), Belonging to space (participation and presence in public space), Space presentability (presence in public space),

A sense of solidarity	Social solidarity [20], Neighborhood social capital [20], Collectivism [30], Gender equality [31], Ownership and control [30], Capacity building [30]		against women	Centers of gathering (collectivism), Cultural and religious spaces (social solidarity-social capital), The space of ceremonies and celebrations (social solidarity and capital)

2.3.3. Comparing the goals and missions of collective arenas and women's social empowerment

The examination and comparison of the goals and missions of collective arenas and goals of women's social empowerment according to Table (4) reveal the common aspects of both issues and make the influence of collective arenas on women's social empowerment more tangible. Given the alignment of the goals of both, we have taken steps towards women's social empowerment with appropriate and responsive design of residential collective arenas.

Table 4: Comparison of goals and missions of collective arenas and women's social empowerment

Mission and characteristics of collective arenas	Goals of women's social empowerment
Inclusive space for all age and gender groups, Having equal opportunities in life [23]	Gender equality [25]
Connecting members of society and forming collective identities [6], Improving social life and interactions [32], Creating collective memories that lead to public cohesion	Social cohesion [20], Collectivism [1], Presence in public spaces [33]
Strengthening the citizens' social roles in achieving sustainable development	Social participation ([34]; [20]; [33]), Active and conscious participation of women in fulfilling personal and social welfare
Providing mental and psychological security for citizens	Reducing the fields of violence [20]

3. Research method

The present research was conducted in three stages: The content analysis method was used in the first stage, based on which the content of social science texts in the field of women's social empowerment was analyzed and the effective factors of women's social empowerment were identified. In the second stage, the factors obtained from the factor analysis of the questionnaires of users (women) in collective arenas of residential complexes were modeled and the path analysis method was used. In modeling the structural equations, data were converted to correlation matrices and the significance of the relationships between the factors and the effect of each variable were calculated as path coefficients. Path analysis helped to identify the mechanism of effects of variables and reported the way of relationships between variables in the real world. Furthermore, there were some hidden relationships between variables that were invisible in the real world, but their relationships were revealed using the modeling. The research method of comparative studies was used in the third stage, and the results obtained from the first stage were analyzed and compared with the results of the second stage of the research.

4. Discussion and conclusion
4.1. Analysis of the first stage of research

Based on the results obtained from [20] research in the research project of Tehran Municipality Research Center in 2010, increasing women's social capital in forms of social participation, social cohesion, and social trust was the most important effective factor in women's social empowerment .[20] (Figure 2) In "The Book of Women and Urban Life" by [1] (quoted from [20]) lists the indices of women's empowerment in four indices: 1- Social (changing attitudes towards women, acquiring communication skills, being in the public space, participation in non-family groups), 2- psychological, 3- economic, and 4- political (Figure 2). In another research by Shaditahab, the variables of social empowerment included four factors, participation in social affairs, collectivism, desire to be present in public spaces, and changes in attitude towards the roles of women. (Figure 2) [33].
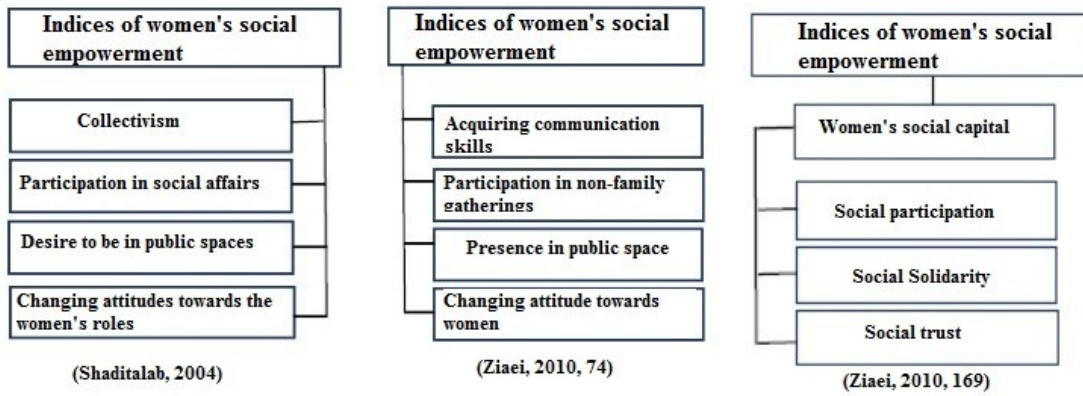
Figure 2: Indices of women's social empowerment from the experts' perspective

The five factors presented in Figure (3) were identified as the most effective factors in women's social empowerment by examining and analyzing the content of experts' opinions and the frequency of each one.
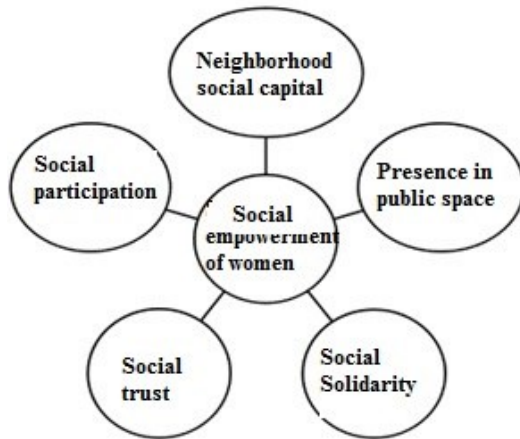
Figure 3: Effective factors in women's social empowerment

The above diagram is summarized as follows by examining the way of relationship and effects of these factors based on the content analysis of theoretical studies:
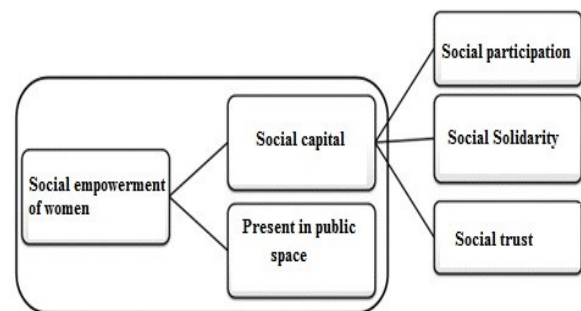
Figure 4: The relationship and effects of effective factors in the social empowerment of women

The two factors, namely the presence in the public space and the increase of women's social capital, are the main indices of women's social empowerment; hence, if collective arenas provide a space for women to attend and gather, and create a necessary context for women's participation and solidarity, finally, the neighborhood social capital of women will be promoted and their social capital of women's neighborhood will be improved through environmental design and increasing the quality of space presentability, and thus the architectural space will have a significant effect on women's social empowerment.

4.2. Analysis of the second stage of research

A total of 7 main concepts were extracted after implementing the questionnaire and R-factor analysis. Table 5 presents the mean and standard deviation values.

Table 5: Analysis of users' questionnaire data

Statistical analysis of factors	Safe territory	Space presentability	Environmental comfort and natural factors	Flexible sociability	Cultural-religious space	Neighborhood social capital	Belonging to space
N Valid	200	200	200	200	200	200	200
Missing	0	0	0	0	0	0	0
Mean	21.8400	13.3600	16.4600	16.7850	9.7650	10.3200	10.3150
Std. Deviation	3.79028	1.95178	2.45121	2.11925	1.76788	1.56199	1.36936

At this stage, the factors obtained from the factor analysis of the questionnaire of the users (women) of collective arenas of residential complexes are modeled, and the path analysis method is used to model structural equations of data in the forms of correlation matrices, and then the significance of the relationships between the factors and the effect of each variable is calculated as the path coefficient. Path analysis helps to identify the mechanism of the effect of variables on each other and reports the relationship between variables in the real world. Furthermore, there are some hidden relationships between variables that are not visible in the real world but can be revealed by modeling their relationship. Table (6) presents the direct and indirect effects and the total standard effects. If the p-value is greater than 0.05, the relationship is insignificant. A p-value of less than 0.05 means the relationship at a 95% confidence level, and a p-value less than 0.01 indicates a 99% confidence level. Figure (5) shows the final model along with the effect of each variable.

Table 6: standard direct relationship, standard indirect relationship, and the sum of standard effects

Relationship of two variables	Standard direct relationship (regression weights)	Standard indirect relationship	Sum of standard effects	Standard error
Cultural and religious space (f5) → Environmental comfort and natural factors (f3)	.345**	.000	.345**	.092
Cultural and religious space (f5) → Neighborhood social capital (f6)	.365**	0.00	.365**	.121
Cultural and religious space (f5) → Belonging to space (f7)	.285**	0.00	.285**	.054
Environmental comfort and natural factors (f3) → Belonging to space (f7)	.159*	.000	.159*	.039
Cultural and religious space (f5) → Safe territory (f1)	.194**	.155	.349**	.136
Environmental comfort and natural factors (f3) → Safe territory (f1)	.449**	0.00	.449**	.098
Cultural and religious space (f5) → Flexible sociability (f4)	265**.	.145	.410**	.082
Belonging to space (f7) → Flexible sociability (f4)	.153*	0.00	.153*	.101
Belonging to space (f7) → space presentability (f2)	.184**	-0.031	**.153	.086
Belonging to space (f7) → Neighborhood social capital (f6)	.209*	-.041	*.168	.112
Space presentability (f2) → Neighborhood social capital (f6)	.179*	0.00	*.179	0.066
Flexible sociability (f4) → space presentability (f2)	0.203**	0.00	.203**	.059
Safe territory (f1) → Flexible sociability (f4)	.267**	0.00	.267**	.037
Safe territory (f1) → space presentability (f2)	.258**	0.054	.302**	.035
Religious-cultural space (f5) → space presentability (f2)	0.203**	0.000	**.203	.071
Environmental comfort and natural factors (f3) → space presentability (f2)	0.105	.174**	.279**	0.053
Environmental comfort and natural factors (f3) → Flexible sociability (f4)	0.00	.144*	.144*	0.065

The model description, which includes the table of standard direct effects, standard indirect effects, the sum of these two, and the significance level, helps to determine the impact value of each variable and identify the mechanism of the effect of variables on each other that are explained in Table (6). The path analysis of the factors results in a model based on the affectability of women's social empowerment factors from environmental components effective in improving the spatial utility of collective arenas. In this model, religious-cultural spaces, as a physical environmental factor in residential collective arenas, create and expand numerous communication networks and increase women's social capital in residential spaces, and they are also effective in both the creation and expansion of women's social capital and their presence in collective arenas due to increasing their belonging to space and again increase their social capital by enhancing their presence in these spaces. These spaces also increase the environmental comfort and natural factors, the creation of safe territories and sociable spaces by developing the space presentability for women, and social capital of women's neighborhoods.
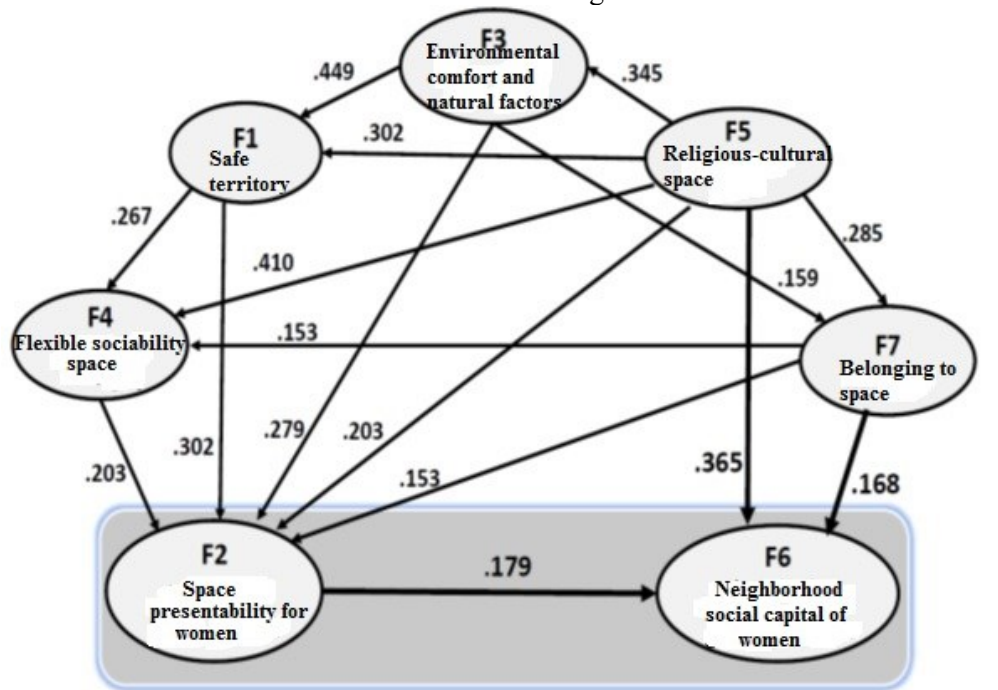

Figure 5: The affectability of women's social empowerment factors from effective environmental components in improving the spatial utility of collective arenas

The effective environmental components in improving the spatial utility of collective arenas both directly and by increasing the presence of women in these arenas increase women's social capital. The acceptability of this model is examined using two indices, probability and CMIN/DF, and this model is confirmed with high acceptability. The acceptability index, P (Probability), is greater than 0.05 and 0.949 for this model, indicating that the model is acceptable. P=0.949 means that if this model is performed 1000 times, this result will be repeated 949 times which is called probability. The chi-square of the model is 0.355 and the degree of freedom is equal to 3; hence, CMIN/DF, which is the result of dividing the chi-square by the degree of freedom, is equal to 0.118. The acceptable value for this index is less than 2 which is confirmed according to the results of the model acceptability table.

Table 5: The model acceptability indices

Characteristics	CMIN	DF	P	CMIN/DF
	Chi-square minimum	degree of freedom	Percentage of probability	Chi-square minimum/degree of freedom
Model	0.355	3	0.949	0.118

4.3.   Analysis of the third research stage

According to the first stage of the research analysis (Figure 4), women's social empowerment is possible through two main components, increasing women's social capital and presence in public spaces. The quality of space presentability should be high for women's presence. Therefore, increasing the space presentability and neighborhood social capital of women in the collective arenas of residential complexes according to the model of Figure (5) can provide both the spatial utility of the arenas and women's social empowerment.

The comparison of the results of analysis of the first and second stages of research and the combination of Figures (4) and (5) leads to the following model as the final model of women's social empowerment affected by environmental factors.
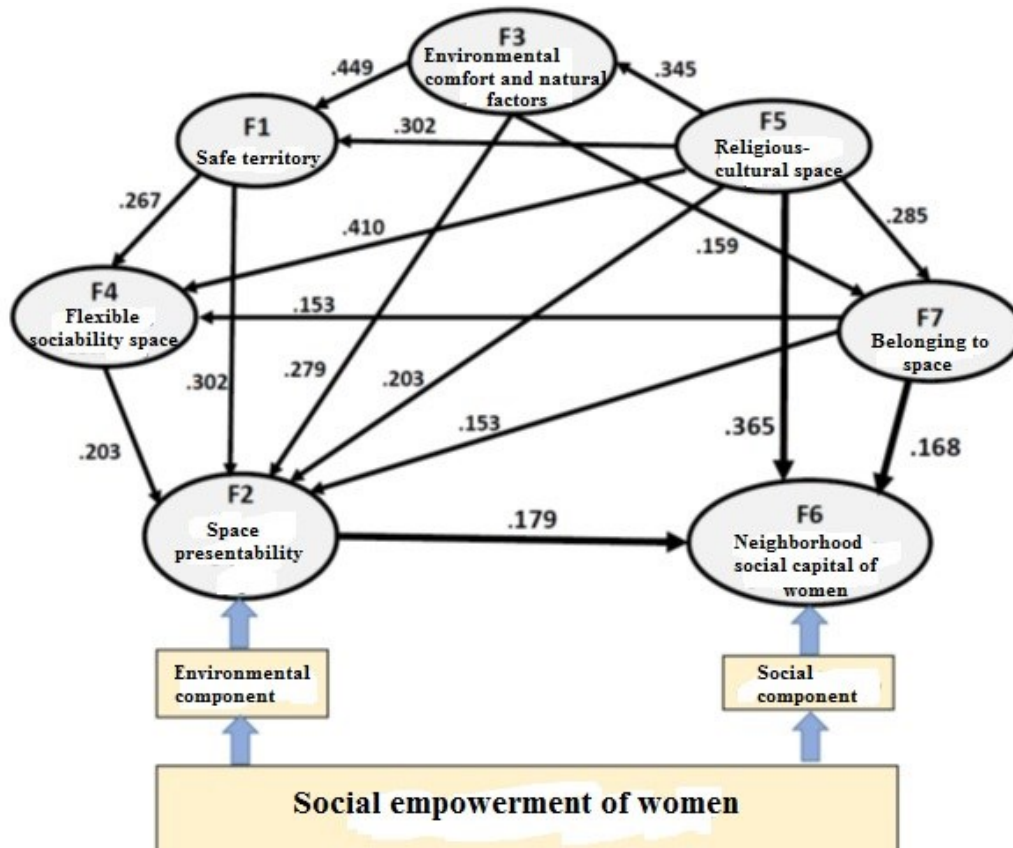

Figure 6: The final model of women's social empowerment affected by environmental factors

5. Conclusion

According to the theoretical foundations and the analysis of the research (explained in detail in paragraph 4), previous studies have been conducted in two section. The first section examines the women's social empowerment indicators that can be referred to the studies of Sarah Lange, Corey O'Hara and Florin Clement 2018;Shaditalab and Ziyaei 2010; Saei Arasi and Valipour 2012; Mousavi and Ravankhah 2016; Ghanbari and Ansari 2015. These studies have only investigated the effective factors of the social empowerment from the social sciences perspective. The second part of the studies concerns to the effective environmental factors in improving the spatial desirability of the collective and public arenas, while this research tries to study the effective role of the quality of architectural space in the women social empowerment that few studies have been conducted on the relationship between space and women's empowerment. In this regard, Parisa Beigi(2021) has investigated the impact of empowering women on neighborhood development. In another research, Sayedeh Zahra Behbahani has stufied the effect of environmental psychology on the empowerment of the women supervising the household and concluded that the connection of the architectural sciences and psychology in the design of the women space accelerates the empowering women process (2016). Other

valuable studies (mentioned in table 1) have been conducted by Partovi, Shokohi, Qoraei and Habibi (2015) under the title of women and urban life regarding Tehran planning and studies center that the characteristics of responsive spaces for all age and gender groups, especially women have been discussed in detail, however, the effect of the quality of the architectural space on the empowerment of women has not been referred. The effective factors of architectural design in improving the desirability of the space, which are also effective in the women social empowerment, were identified and modelled and the final model was proposed. Figure (6) indicates the effect of the environmental components and factors of architectural design in the women social empowerment as follows:

- The design of cultural-religious spaces as a physical environmental factor by creating and expanding many communication networks increases women's social capital in residential spaces.

- The cultural-religious space factor increases the space presentability for women directly by creating safe territories for women and increasing the space sociability and increasing the sense of belonging to space.

- Natural factors (diversity of green spaces and vegetation, water, etc.) and environmental comfort (climatic comfort, acoustic comfort, visual comfort) increase the space presentability for women by creating safe territories for women and increasing their belonging to space.

Therefore, we can answer the research question (How is the improvement of the spatial quality of collective arenas of residential complexes effective in the social empowerment of women) by summarizing the above-mentioned cases; hence, the spatial quality of collective arenas of residential complexes, affected by environmental factors, is effective in women's social empowerment by increasing their social capital and presence in collective arenas of residential complexes.

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