

Functional Dimension and Social Capital in Urban Spaces of Tehran; Case Studies: Sa'adat Abad, Nazi Abad, and Narmak Neighborhoods

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ABSTRACT

The neighborhood has long found its social dynamism dependent on its spaces and places. On the one hand, it seems that the interactions and relationships of the residents are formed in the public spaces of the neighborhood, and on the other hand, the public spaces of the neighborhood find their identity from the existing social life. Hence, differences between the functional structure of neighborhoods can lead to changes in the social capacities of the neighborhood. The methodology of the current study was qualitative and aimed to identify the relationship between the components of the functional dimension and the social capital of Tehran residents. In a descriptive-correlational design, 300 residents of the Sa'adat Abad, Nazi Abad, and the Narmak neighborhoods were selected by simple random sampling and answered a self-regulation questionnaire. Data were analyzed using descriptive statistics and Pearson correlation coefficient. The results indicated that there is a positive and significant relationship between all components of the functional dimension and social capital in general. The mixed land use dimension had the most relationship with social capital, and the use of space in responding to the needs and efficiency of the network and comfort in space were ranked next. Regarding the relationship between the components of functional dimension and social capital by neighborhood, the results showed that Sa'adat Abad neighborhood had the lowest relationship and Nazi Abad and Narmak neighborhoods had the highest relationship. Assessing these relationships can help urbanism experts provide solutions to improve the efficiency and effectiveness of urban public spaces and interventions to increase social capital.

Keywords: Urban Public Spaces, Social Capital, Functional Dimension, Mixed Land Use, Density, Environmental Design, Macro Network.

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1. INTRODUCTION

The studies on the social capital have identified the neighborhood as a significant urban physical space in which informal social networks create important processes for the welfare and quality of life (Cattell, 2001; Forest & Kearns, 2001; Hays & Kogl, 2007). Indeed, the neighborhood has long found its social dynamism dependent on its spaces and places. Hence, the main part of these studies emphasizes the necessity to consider the interactions between the social networks, social capital, and people's relationship with the place(s) where the social activities have been provided (Jorgensen, 2010). On the one hand, it seems that human relationships and interactions are formed in the function and physique of the city, and on the other hand, the physique and function find their identity from the existing social life. It has led urban planning experts to understand the neighborhood better as a meaningful issue for those who live in it. That is to say, the more a neighborhood establishes a relationship with its residents through the functional and physical features, the more influential role it will have in the formation of their social capital (Grant, 2002). The neighborhood has long been studied by researchers as the most prominent urban space, which affects the residents' social interactions (Forrest & Kearns, 2001). Understanding the relationship of the social capital is the basis for residents' social solidarity and social activities, assuming that the social interaction occurs at the neighborhood level. Hence, the qualitative dimensions of urban design, such as the functional dimension, can have a significant effect on the residents' behavior and social capital. Due to the various components of the functional dimension, such as the usage of the public spaces, mixed land use and density, environmental design, and road network in the neighborhoods of the city, the degree of effectiveness and the type of individuals' relationship with them is different. Thus, the extent, intensity, and type of the current interactions in the different spaces will not be the same. Carmona (2008) believed that various functions and the freedom of acceptable social activities are among the factors that can improve the function of the urban environment, stimulating the civic participation of the residents in the neighborhood and affecting their participation and presence in the places. Whyte (1990) believed that the structure of the street affects the people's behavioral patterns, and the relationship between the functional components and streets is one of the most significant variables in establishing the interaction and development of the social relations between the people who live in a neighborhood. Hernback (2012) also emphasized that the number of traffic in the road network increases the residents' interaction with others and provides more opportunities for social dynamicity in the neighborhood.

In this regard, several studies investigated the relationship between some of the components of the

functional dimension and social capital (Hanson & Hillier, 1987; Bagheri & Amouei, 2019; Grant, 2002). Evidence shows that the higher the density and the more space is there for walking, cycling, and public transportation, the better the social interactions (Carmona, 2008). These studies emphasized that the people who live in a place with a strong physical identity are encouraged to establish a relationship with each other and the environment and build social capitals (Dale, Ling, & Newman, 2008). Besides the functional dimension, social capital is considered a significant factor for urban design and planning (Manzo & Perkins, 2006). Therefore, many of the projects of improving the environmental quality attempt to use the social capital to achieve the purposes of the environmental quality. The literature shows that strong social networks lead to more support of the supportive policies of the functional and physical environment of the city (Dean et al., 2016).

It is noteworthy that the relationship between the components of the functional dimension and social capital has been less considered in the previous studies among the urban spaces, which are different in terms of social, economic, and cultural nature. Therefore, the current study identified the relationship between the components of the functional dimension and social capital in Sa'adat Abad, Nazi Abad, and Narmak neighborhoods. While comparing the functional dimension and social capital in three spaces with a distinctive identity, it seems that the differences between the functional structure of these neighborhoods lead to change in the social capacities. Thus, the main hypotheses of the current research are as follows:

1. There is a relationship between the components of the functional dimension of urban spaces in Tehran and residents' social capital.
2. The relationship between the functional dimension and social capital is different in Sa'adat Abad, Nazi Abad, and Narmak neighborhoods.

2. LITERATURE

By studying the literature of the concepts, such as social capital, it can be understood that various experts have stated different interpretations in disciplines, such as humanities, psychology, social sciences, and human geography. The functional dimension of urban design is not an exception and enjoys various definitions and points of view. The current study attempted to review this literature comprehensively and study the most practical definitions.

2.1. Social Capital

Social capital is an interwoven set of continuities, communication links, and connected communications. Continuity refers to communications, interactions of the actions, and individuals' social relations in the sociable areas of the society or institutes. Simply, social capital is the result of human's acquaintance with each other

and originates from familiarity and trust, resulting in positive outcomes in people's lives (Seydaei, Shapoor Abadi, & Moein Abadi, 2009). Bohlen (1998) suggested participation in the local community, activity in the context of the society, the sense of trust and security, neighborhood communications, interactions with friends and relatives, capacity to accept differences, work links, and value of life as the dimensions and indicators of the social capital. For Coleman (1988), there are three forms of social capital as follows: commitments, expectations, and reliability in the social structure, information networks, and influential norms (Eriksson, 2010). According to Bourdieu (1983), social capital is the result of the accumulation of the potential and actual resources related to the ownership of a durable network of the more or less institutionalized relationships between the people created by being a member of a group (Bourdieu, 1983). Cohesion and solidarity are the sense of responsibility between several people or groups with the required awareness and will and have a moral meaning ensuring the existence of thought, task, or mutual obligation. Also, a positive meaning is interpreted from it and refers to the mutual dependency of the functions, members, or the creatures in a structured whole (Putnam, 2013).

The social capital is a set of norms of the social system, leading to increasing the level of solidarity and cooperation between the society members and decreasing the cost of the interactions and communications (Fukuyama, 2006). Trust is one of the most significant constituent components of the social capital, resulting in cooperation, participation, and interactions between the people in the social groups and leads to facilitating the individual's social relations with other people of society. Trust and social capital can preserve the sustainability of society. In other words, it is the trust that determines the norms and systems in a community to achieve sustainability (Grootaert, Narayan, Jones, & Woolcick., 2005). Thus, social capital means the social relations and interactions formed between the people based on the social norms and leads to trust between the social activists. These interactions occur in social networks or lead to producing social networks, and finally, resulting in accomplishing actors' common purposes. Therefore, social capital is not material in nature, it does not exist in a person, but it exists in the relationships between the people and emerges there (Putnam, 2013). Indeed, social capital is the product of humans' acquaintance with each other and originates from the trust, and leads to positive results in people's lives.

Table 1. Theorists' Views on Social Capital

Theorist	Social Capital	Reference
Norris & Bryant	Social participation, social commitment, the degree of empowerment, sense of membership in the community, and social networks.	(Bahrani & Aminzadeh, 2006)
Putnam	Trust, norm, and networks (awareness, participation, and civil organization)	(Putnam, 2013)
Bollen & Ownkiss	Participation in the local community, activity in the context of the community, sense of trust and security, the neighborhood relations, interactions with friends and relatives, capacity to accept differences, work link, and value of life.	(Cited by Bowels & Herbert, 2000)
Fukuyama	The crime rate, family breakdown, drug use, and litigation and complaints.	(Fukuyama, 2006)
Organization for Economic Cooperation and Development	Social participation, social support, social network, and civic participation.	Organization for Economic Cooperation and Development
Humphries and Dinen	Values, Networks, and norms of cooperation	
Leyden & Kevin	Neighborhood link, social network, civil participation, and social trust	(Bahreini & Aminzadeh, 2006)
World Bank	Nods and networks, trust and cooperation, collective activities, information, communication, and solidarity.	World Bank Research Group WB (2001)
Lee, Pickles, Suvich	Neighborhood link, social network, and civil participation	(Tajbakhsh, 2005)
Brehm & Rahn	Household income, job status, religion, education, age, size of household, gender, and women's participation	

Since the daily activities form in the public spaces, doing some of these activities depends on using the urban spaces. However, for some people and many

social and individual activities, the quality of urban spaces plays a determining role in the land use or the lack of usage of the urban spaces. Various urban spaces

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have a significant effect on social capital (Chisun & Sugie, 2016). Some of the social problems in urban regions are caused by the consequences of weakening the social capital in the urban society. The composition of the design and good urban structure and the cultural identity of being urban is important for improving social capital (Syaom et al., 2004, p. 69).

2.2. Functional Dimension

Quality is the state of a phenomenon, which has a specific emotional and rational effect on the human. Quality distinguishes the phenomena and can be the result of the form, function, or meaning of something. Similar to other phenomena, the urban spaces have also quality and enjoy the meaning, function, and form components. The more consistent and coordinated are these components, the better will be the quality of space. The task of urban design is recognizing and coordinating these components.

Many experts have classified and suggested the qualitative dimensions of the urban space. One of these classifications was proposed by Carmona (2008). He classified the influential qualities on the environment and urban public spaces into six classes as follows:

- Physical component
- Perceptual or semantic component
- Social component
- Visual component
- Functional component
- Temporal component

One of the most significant qualities of the proper urban space is its accessibility for all groups. Also, the existence of the various functions and freedom of the acceptable social activities are among the factors that lead to improving the function of the urban environment. The functional dimension of the space is related to the qualities that depend on the existent activities in the space and the function of the space. The functional dimension means that how places function, how people use that, and how urban designers can design better places. Carmona (2008) classified the functional dimension into four classes: the use of the public spaces, mixed land use, and density considerations, environmental design, and network efficiency.

2.2.1. The Usage of Urban Spaces (Meeting the Needs)

Design of urban spaces should be done considering how people use these spaces because the successful places are equipped for people to use. In the application and design of the public spaces, the urban spaces must meet the users' needs and respond to the design concepts in addition to being meaningful (the possibility of establishing a strong relationship between the place

and people) and democratic (accessibility for all groups and providing the freedom of action) (Carmona, 2008).

2.2.2. Mixed Land Use and Density

Development of mixed land use is a planning project conducted by a combination of some land uses, such as retail, administrative, residential, hotels, recreation and leisure, and other functions. The main principle in this planning is walkability and considering the elements related to the living, work, and playing environments (Delisle & Grissom, 2013).

The life of the public urban space depends on the overlapping and continuity of the functions, and the perception of the city requires the combined and mixed distribution of the land uses as the necessary phenomena. Also, the prerequisite of the active and vital environment and creating the functional mixture is the adequate population and activity density. Density is one of the key concepts in urbanism and is considered the first urban space attribute that without having a minimum density, the urban space makes no sense. The dense urban space in terms of form and scale is a proper space for walking, riding a bicycle, and public transportation and encourages and improves social interactions (Pour Mohammadi & Qorbani, 2003). Although the urban density is agreed upon by all the experts of the urban issues, as an approach to achieve sustainable development, there is no consensus on its compactness or broadness, i.e., type of density, due to its complexity.

2.2.3. Environmental Design

The main part of the urban design is providing the comfort conditions in the public spaces. The surfaces of the solar radiation, shadow cover, the degree of temperature, humidity, rainfall, wind blow, noise pollution will have effects on our experience from the environment and the use of the public spaces. Some measures in design can take place to make the conditions more acceptable to the use of the environment. These measures include interference in the formation of space, the creation of microclimate, solar radiation, shadow cover, air movement around the building, and lighting (Carmona, Magalhaes, & Leo, 2008).

2.2.4. Efficiency of Macro Network

The macro network includes different structural levels of the urban facilities. The main macro network in the urban design is as follows: providing the open public space, designing street and sidewalk, the sidewalk space, parking lot and service spaces, and other infrastructural facilities. Generally, the elements and criteria of the functional dimension of the urban design were presented in Table 2.

Table 2. The Elements and Criteria of the Functional Dimension of the Urban Design

Dimension	Criteria
Functional	Network Efficiency
	Environmental Design
	Mixed Land Use and Density
	The Usage of Public Spaces in Meeting the Needs

(Carmona, Magalhaes, & Leo, 2008)

2.3. The Functional Dimension and Social Capital

The public urban spaces are considered the most significant urban environments that have unique functions and attributes. These spaces must have some features at each level and function to meet the needs and demands of the users and citizens. Among the most significant attributes are the physical form, access network, and space arrangement that have a significant effect on citizens' social relations. Social relations can be formed in different places and environments. Thus, this attribute plays a considerable role in the social product of the city and the formation of the social capital disregarding the scale and type of place (Krafta, 2013). Many studies addressed the relationship between the elements of the urban form and the social interactions of the humans in the city. Morton (2002) pointed out the deep-rooted relationship between the social life and the form of the urban space and believed that the built space affects the users' perceptions and social behavior (Morton, 2002). Therefore, if the social relations do not occur properly, it implies that the relationship between space and society has not been established well (Hanson, 2000). Burley (2016) also studied the social capital and interactions quantitatively and qualitatively considering the physical nature of the neighborhoods. According to Burley, two potential competitive mechanisms, i.e., distance to the interaction space and density, affect the formation of the interactions. The quantity of social interactions and social capital increases by reducing the distance and increasing the density (Burley, 2016). Grant (2002) believed that mixed land use and high density cause an increase in social relations, leading to improving social capital. Creating an environment in which the residents can have easy access to a wide range of land uses can contribute to increasing social capital. Influential factors, such as the size of the buildings, demographic pattern, and the number of the residential units, play a role in the relationship between mixed land use and social capital. Also, the historical background and the dimensions of the development affect the relationship between the mixed land use and social capital directly. Hanson and Hillier (1984) addressed the effectiveness of the environment on the nature of the social behavior in a study and pointed to the relationship between the interactions of the social groups, demarcation, and the arrangement of the plots (Hanson & Hillier, 1984). According to Hanson, the transformations in

the physical features, even on the neighborhood scale, was not the only change in the spatial arrangement of the residential units but also affects the way people use the space, encounter, and behavior with others. Hillier (1996) also showed in a study that there is a high correlation between the movement patterns of the pedestrian, the form of the city, spaces, and its activities. He emphasized that although there is certainly a correlation between the movements and the interaction points, the spatial configuration can have considerable effects on the social movements among the residents of a city or a neighborhood (Hillier, 1996). The area of a person's real interaction is determined by the distance he/she travels during a day. The more movement a person has, the broader will be his/her social interaction and the possibility of improving the social capital will increase. Leyden (2003) addressed the relationship between the social capital and built environment in a study and indicated that the residents of the walkable neighborhoods obtained higher scores than the vehicle-oriented neighborhoods in the social capital indicators (Leyden, 2003). Shakibaei and Tabibian (2017) investigated the effects of the physical form on the social capital in the neighborhoods of Qazvin. The results showed that the maximum social capital had been formed among the neighborhoods with compatible features with the semi-organic context. Also, while there was a significant relationship between the physical indicators and social capital, the intensity and impact factor of these factors were not the same and so that the factors that have the direct relationship with the permeability and land use had more significance in the formation of the social capital in these neighborhoods. Bagheri and Amouei (2018) also studied the role of the spatial-physical plan of the urban neighborhoods in improving the social capital. The findings indicated that the connection between the public spaces, the neighborhood relations, improving the social centers of the neighborhood, mixed and diverse land use, continuity, and equipping the pedestrian network can facilitate the formation and improvement of the social capital. It seems that the low quality and poor functional dimensions of the urban neighborhoods affect various social functions and activities, directly and indirectly. Some of these activities cause a change in the urban spaces and their corresponding expectations. Thus, factors such as access, the structure of context, density, demographic characteristics, the land use, the functional arrangement, distribution of the social activities can be effective in

the formation of the social capital among the residents besides being the constituent factors of the form and the physique of the urban neighborhoods and can ensure the intensity and quality of the social capital resulted from the simulations presence of human, activity, and space.

The literature review indicates that the relationship between the components of the functional dimension and social capital has been more studied in social studies and a specific social context and space. However, it seems that this relationship in the urban spaces is different, not similar, and has differences in terms of cultural, economic, and social nature. Therefore, in line with the previous research and to complete these studies, the current study identified the relationship between the components of the functional dimension and social capital in Sa'adat Abad, Nazi Abad, and Narmak urban neighborhoods that have a distinct identity and social, economic, and cultural differences. It seems that the differences between the functional structure of these neighborhoods cause a change in social capacities.

3. METHOD

The current research was applied and explanatory research in terms of purpose. According to Blaikie, explanation refers to showing the elements, factors of the mechanisms involved in creating a situation or the regular sequences of the social phenomena, and searching for the causes of occurrence of a phenomenon or a particular regular sequence is considered in the scientific explanation.

3.1. Research Design

The research method was quantitative and applied in terms of purpose and given the data collection method, it was descriptive-correlational.

3.2. Sample Size and Sampling Method

The sample is a part of society that represents the whole society. Being representative means that all the characteristics of the population, especially those traits that are important in terms of the subject under study, are proportionally present in the sample and at the same time the results can be generalized to the entire statistical population.

3.2.1. Sample Size

One of the most important issues in research is the selection of sample size because if we consider the sample size high, it leads to a lot of work and high cost. If the sample size is considered low, the research will not lead to the necessary efficiency, and incorrect and non-generalizable results to the statistical community will be obtained (Mansori, 2007).

The statistical population included all the people who use the space and live in the Sa'adat Abad, Nazi Abad, and Narmak neighborhoods. In line with

the purpose of the study, due to the large size of the statistical population, the following formula was used to determine the sample size required to estimate the ratio parameter in qualitative characteristics. In this design, the quality attribute under study is defined as follows: "A ratio of people present in the squares and streets under study and live in that neighborhood".

$$N = \frac{\left[z_{1-\frac{\alpha}{2}} \right]^2 (p \cdot (1-p))}{d^2}$$

In this research, considering that the value of the "p" ratio is not specific, to maximize the sample size and consequently, the accuracy of the results, it was considered $p=0.5$ in the above equation. The minimum required sample size of 267 was obtained considering the value of 0.06 for the absolute error of estimation and the value of 0.05 for the maximum error of the first type α . As some of the questionnaires might not be completed or be not useful due to the lack of participation, impatience, etc., thus, in this design, the number of the samples was increased by 300. Hence, 100 people from Sa'adat Abad Neighborhood, 100 people from Nazi Abad Neighborhood, and 100 people from the Narmak neighborhood were studied using a simple random sampling method.

3.2.2. Sampling Method

Sampling is a method by which a part of the statistical population that can be generalized to the whole statistical population can be selected by studying it. In this study, due to financial constraints, the size and number of urban spaces under study, and also to minimize the sample size, the random method was selected for sampling.

3.3. Study Area

Selected neighborhoods in three different regions in terms of social, cultural, and economic, in districts 2, 8, and 16 in the north, middle, and southern areas of Tehran, respectively, were selected. The study area in this research included Sa'adat Abad, Nazi Abad, and Narmak neighborhoods. The streets and squares appropriate to the research objectives were selected using previous studies and the nature of the research. It was tried to select the axes that have the relative quality at first glance. Considering that the urban space is a space for the occurrence of social interactions, it was attempted that these axes have the proper extent of the citizens' presence in the public urban space. Accordingly, the most significant feature of the spaces of each selected neighborhood was as follows:

- District 2: Sa'adat Abad Neighborhood, Sa'adat Abad Street, Kaj Square
- District 8: Narmak Neighborhood, Ayat Street, Haft-e Hoz Square
- District 16: Nazi Abad Neighborhood, Mada'en Street, Bazar-e Dovom Square.

3.4. Measures

Self-regulation questionnaire: A self-regulation questionnaire was used to assess the functional dimension and dimensions of social capital. Generally, 48 questions were considered to assess the status of the social capital and considering the theoretical foundations and the conducted studies in this regard. Also, four main components (usage of public spaces to meet the needs, the mixed land use and density, environmental design, and network efficiency) were selected to assess the status of the functional dimension considering the theoretical foundations in this regard. The number of the questions to assess each variable was as follows: usage of the public spaces (8), mixed land use and density (4), environmental design (3), and network efficiency (3). The questions of all the dimensions were regulated and provided in a Likert Scale (very few, few, never, much, very much). The content face validity was used to determine the validity of the questionnaire. Thus, the questionnaire was sent to the experts and specialists of urban planning, and their opinions and revisory critics were applied in the questionnaire, and eventually, the questionnaire was set based on their opinions and approval. Also, the internal consistency of the questionnaire was calculated based on Cronbach's alpha values of which were 0.69 for the dimension of the social capital, and the values obtained for the functional dimension were as follows: the usage of the public spaces (0.84), mixed land use and density (0.64), environmental design (0.64), and network efficiency (0.85). All of the obtained values

were at the desirable and acceptable level.

3.5. Procedure

To collect the data, first, the participants were selected randomly, and the purpose of the research was explained to them. Then, after attracting cooperation, the questionnaires were distributed among them and then collected. Also, to analyze the data, the statistical methods were used to compare the mean of the variables per neighborhood, and the Pearson Correlation Coefficient was used to identify the relationship between the variables.

4. RESULTS

The data were collected from the people present in the selected public spaces of Tehran. The average age of the people in Sa'adat Abad neighborhood was 30 years old, in Nazi Abad neighborhood was 33 years old, and 38 years old in Narmak neighborhood. The age range varied between 17-83 years old. Also, in terms of economic status, out of a total of 100 citizens selected in the Sa'adat Abad neighborhood, 16% reported their status as excellent, 45% as good, 31% as average upward, 6% as average, and 2% as average downward. In Nazi Abad neighborhood, 16% reported their status as excellent, 32% good, 17% average upward, 33% average, and 2% bad. In the Narmak neighborhood, 6% stated their economic status as excellent, 22% good, 29% average upward, and 43% average. Other additional descriptive features were listed in Table 3.

Table 3. Demographic Characteristics of the Participants

Neighborhood	Gender	(%)	Marital Status	(%)	Type of Ownership	%	F(%)
Sa'adat Abad	Male	48	Single	65	Tenant	20.7	
	Female	52	Married	35	Owner	77.2	
Nazi Abad	Male	40	Single	43.6	Tenant	13.7	
	Female	60	Married	56.4	Owner	86.3	
					Council House	-	
Narmak	Male	50	Single	46.7	Tenant	16	
	Female	50	Married	53.3	Owner	84	
					Council House	-	

The results indicated that the observed difference in the functional dimension of the studied neighborhoods was significant, based on the F test (Table 4). In other words, there was a significant difference between

the three neighborhoods, Sa'adat Abad, Nazi Abad, and Narmak, in the functional dimension based on the opinions of the citizens and residents of these neighborhoods.

Table 4. Comparing the Functional Dimension Components Generally in the Neighborhoods Understudy

	Mean	Standard Deviation	Minimum	Maximum	F Value	Significance
Sa'adat Abad	37.376	3.953	28	47	47.869	0.000
Nazi Abad	42.046	4.935	24	50		
Narmak	44.482	5.018	34	52		
Total	41.456	5.5057	24	52		

According to the results of Table 5, there was a significant difference in the component of the mixed land use and density among the neighborhoods. Nazi Abad neighborhood had the maximum value of the mixed land use, and the Sa'adat Abad neighborhood had the minimum value of the mixed land use based on the citizens' opinions. The results also indicate that there was a significant difference in the space usage among the neighborhoods in terms of citizens'

opinions. Narmak neighborhood had the maximum value of the usage of space to meet the needs, and the Sa'adat Abad neighborhood had the minimum value. Moreover, the Narmak neighborhood had the maximum value of environmental design, and the Sa'adat Abad neighborhood had the minimum value. Also, there was a significant difference in environmental design between the three neighborhoods based on the citizens' points of view.

Table 5. Comparing the Mean of the Functional Dimension Components in the Studied Neighborhoods

Components of the Functional Dimension	Studied Neighborhood	Mean	Standard Deviation	Minimum	Maximum	F Value	Significance
Mixed Land Use	Sa'adat Abad	8.591	1.306	5	11	10.337	0.000
	Nazi Abad	9.546	1.534	4	12		
	Narmak	9.030	1.549	5	12		
Usage of Space to Meet the Needs	Sa'adat Abad	18.505	2.009	16	23	16.983	0.000
	Nazi Abad	19.545	2.711	13	25		
	Narmak	20.777	2.913	14	27		
Environmental Design	Sa'adat Abad	3.622	1.247	2	8	103.798	0.000
	Nazi Abad	5.173	1.354	2	8		
	Narmak	6.309	1.317	3	8		
Network Efficiency	Sa'adat Abad	6.281	1.343	4	10	63.910	0.000
	Nazi Abad	7.505	1.347	4	10		
	Narmak	8.383	1.377	6	11		

Furthermore, the results of Table 5 showed that the Narmak neighborhood had the maximum value of the network efficiency and Sa'adat Abad neighborhood

had the minimum value, and there was a significant difference in the network efficiency between the neighborhoods based on the residents' points of view.

Table 6. Correlation Among the Functional Dimension Components and Social Capital

Row	Functional Dimension Components	Social Capital	
		Correlation Coefficient	Significance Level
1	Mixed Landuse	0.468**	0.000
2	Space Usage to Meet the Needs	0.424**	0.000
3	Environmental Design	0.250**	0.000
4	Network Efficiency	0.288**	0.000

** : Significance Level Less Than 0.01

Pearson Correlation coefficient was used to determine the relationship between social capital and functional dimensions (Table 6). The results indicated that there was a positive and significant relationship between the social capital and all components of the functional

dimension at the significance level of 99%. Among the components of the functional dimension, the mixed land use and density had the highest correlation with the social capital. Also, the environmental design had the minimum correlation with the social capital.

Table 7. Pearson Correlation Coefficient between the Functional Dimension Components and Social Capital

Functional Dimension Components	Social Capital		
	Neighborhood	Correlation Coefficient	Significance Level
Mixed Land Use	Sa'adat Abad	0.467	0.000
	Nazi Abad	0.243	0.048
	Narmak	0.228	0.045
Space Usage to Meet the Needs	Sa'adat Abad	-0.094	0.490
	Nazi Abad	0.199	0.142
	Narmak	0.675	0.000

Functional Dimension Components	Social Capital		
	Neighborhood	Correlation Coefficient	Significance Level
Environmental Design	Sa'adat Abad	-0.160	0.213
	Nazi Abad	0.381	0.003
	Narmak	0.251	0.003
Network Efficiency	Sa'adat Abad	0.322	0.011
	Nazi Abad	-0.149	0.255
	Narmak	0.436	0.000

The results of the Pearson correlation coefficient indicated that there was not a significant relationship between the components of the space usage and environmental design in the Sa'adat Abad neighborhood. However, there was a significant and positive relationship between the components of the mixed land use and network efficiency and the social capital in the Sa'adat Abad neighborhood (Table 7). Moreover, no significant and positive relationship was seen between the components of the space usage and network efficiency and the social capital in the Nazi Abad neighborhood while there was a significant and positive relationship between the components of mixed land use and environmental design and the social capital. Also, a positive and significant relationship was seen between the social capital and all components of the functional dimension in the Narmak neighborhood.

5. DISCUSSION AND CONCLUSION

The current research studied the relationship between the functional dimension of the urban space quality and social capital. Thus, the relationship between the components of the functional dimension and the social capital was studied, analyzed, and explained in three prominent axes of the Narmak, Sa'adat Abad, and Nazi Abad neighborhoods of Tehran. The obtained results showed that there was a significant and positive relationship between the citizens' social capital and the components of mixed land use and network efficiency in the Sa'adat Abad neighborhood, components of environmental design and mixed land use in the Nazi Abad neighborhood, components of the space usage to meet the needs, network efficiency, mixed land use, and comfort in the space in the Narmak neighborhood. Therefore, it can be said that the obtained results showed a significant and positive relationship between the functional dimension and social capital. In other words, as the functional dimensions of the urban space improve, the social capital increases as well. These results are in line with the previous studies, such as Leyden (2003), Baum and Palmer (2002), Brocato (2006), Burt et al. (2000), Grant (2002), Rahimi et al. (2020).

The research indicated that among the functional dimensions, the mixed land use and density have the highest correlation with the social capital. The previous studies emphasized that mixed land use and high density lead to increasing social relations, improving

social capital. Creating an environment where the residents can have easy access to a broad range of land uses can contribute to increasing social capital. Mixed land use is often suggested as an option with the ability to be surveyed, easy, and dynamic (Grant, 2002), which can improve the social capital. That is to say, the more the use of the mixed land uses, such as the size of the buildings, demographic pattern, and the number of the residential units, the more the social capital will be improved. Also, the historical background and the development dimensions directly affect the relationship between the mixed land uses and the social capital. High density is another factor that plays a role in increasing social capital. The high density leads to increasing the social relations, walkable spaces, green and open spaces, resulting in the crease in the social relations. Therefore, the results of this study are in line with the previous studies, such as Nabil and Eldayem (2015), Grant (2002), and Kang (2006).

Regarding the component of public space usage to meet the needs, the results showed that after the component of mixed land use and density, it has the highest relationship with social capital. In order to understand and explain this issue, it can be said that urban public spaces are considered important urban environments that have unique features and functions. These types of spaces at every level and function must have characteristics to meet the needs of citizens. Therefore, a high-quality urban environment conveys a sense of satisfaction to citizens through physical, social, or symbolic factors. This feeling of satisfaction increases the presence of citizens in space and the rate of interaction and social participation, resulting in increasing social capital. These findings are in line with the previous studies, such as Yvez and Foncez (2002) and Joongsub and Kaplan (2004).

The access network was another component of the functional dimension. The results indicated a significant and positive relationship between this component and the social capital in the selected spaces. Lynch classified the access network into the ability to access the activities, resources, services, information, and places, including the value and type of the accessible factors (Bahreini & Aminzadeh, 2006). Access to the facilities and service is one of the features and qualities of a good city because the constant receiving of service has a direct and significant effect on people's daily life. Therefore, the location of the services in the space,

the access radius, and supporting the services are considered the features of a successful space, leading to increasing the social capital.

The results indicated the appropriate situation of the Narmak and Nazi Abad neighborhoods in terms of the functional dimension and social capital. The Narmak and Nazi Abad neighborhoods could preserve their identity as distinctive neighborhoods than other neighborhoods considering the more compact context, high social relations among the residents, and diverse land uses. In these neighborhoods, the residents have a sense of emotional belonging and pleasure by living in the stated neighborhoods, and the social links between the residents of the neighborhoods are high and the social relation and interaction have led to improving the residents' sense of belonging. In these neighborhoods, indicators such as local cooperation, social solidarity, participation in local affairs, sense of security and safety, trust, and identity with the place are at a high level. For this reason, it can be explained that neighborhoods such as Narmak and Nazi Abad, which have high social solidarity and desirable functional components, showed a greater relationship with social capital in this study. However, it seems that newer neighborhoods, such as Sa'adat Abad with low density, non-mixed land uses, public spaces that do not meet the social needs of the residents, spatial identity, continuity, and integrated social links among the residents are not the same as other neighborhoods. Therefore, this neighborhood showed a relatively weaker relationship between the functional dimensions and social capital in this study. These results are in line with the previous studies, such as Grant (2002), Kang (2006), and Yu and Li (2008).

The current study faced constraints in implementing the research. The research was conducted in three urban spaces of Tehran which were the prominent axes of a neighborhood. Therefore, the other types of urban spaces were not studied. Hence, the results cannot be generalized to other public urban spaces as there is no awareness of the effect of a similar relationship in other spaces. Secondly, the causal relationship was not studied in this research, and the simultaneous relationship between two components of the functional dimension and the social capital was investigated, and it is not determined which other component can predict this relationship. Therefore, it is suggested that in future research on social capital and functional dimension, the functional relationship between the two components of functional dimension and social capital in urban space along with other variables should be studied to identify the determining and predictor factors of these two components. Also, the relationship between functional dimensions and social capital in other urban spaces such as squares, sidewalks, etc., should be addressed. Finally, the relationship between spatial qualities that lead to the strengthening of the functional dimension and social capital in Iran must be investigated.

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