

Social capital and the spatial quality of neighborhoods: Parameters, indicators & strategies

Hadi NIKOUNAM NEZAMI¹, Ali ASADPOUR²

¹ nikounam@apadana.ac.ir • Department of Architecture, Faculty of Art and Architecture, Apadana Institute of Higher Education, Shiraz, Iran

² asadpour@shirazartu.ac.ir • Department of Interior Architecture, Faculty of Architecture and Urbanism, Shiraz University of Arts, Shiraz, Iran

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Abstract

Although there is extensive literature on the issue of social capital, studies that focus on the social issues of residential neighborhoods complain about a lack of socio-physical relations in planning and design strategies. Since social capital is one of the effective paradigms for creating social sustainability, its dimensions and parameters in neighborhoods remain questionable. This study aims to propose a model for increasing social capital in residential areas and suggest strategies and design criteria based on it. With this issue in mind, the present study applies a qualitative approach. In an attempt to identify the components and indicators of social capital, this paper primarily focuses on the developments of social capital. Then based on the analysis of theoretical studies, the development of social capital indicators are defined in residential neighborhoods. As a result, the components of social capital are categorized as a) social networks, b) common values, c) norms, and d) trust. Our final four-parameter model consists of “social participation and interaction” (social dimension) and “place attachment and spatial equity” (physical dimension) based on literature review in neighborhood studies. Based on the stated parameters, planning strategies and design criteria are recommended as “creating and supporting public realm” (social interaction), “resident participating in the physical space management and construction” (social participation), “increasing the presence of citizens in public and open spaces” (place attachment), and “appropriate distribution and location of functions and amenities” (spatial equity).

Keywords

Social capital, Residential neighborhoods, Social capital indicators, Spatial quality, Neighborhood sustainability.

1. Introduction

Today, the design of residential neighborhoods does not take into account the sufficient community-based approaches that affect citizens' social capital. Traditionally, "the urban neighborhood has been defined as an urban space where residents share a communal bond built upon local communities and social networks" (Mahmoudi Farahani, 2016, p.369). According to this definition, the importance of neighborhoods' social-physical structure should more than ever be considered. In other words, planners should attach more importance to social capital as a mechanism for achieving social inclusion and social cohesion (Flint & Kearns, 2006) in the structure of a neighborhood planning. Residents' failure to participate in social events, lack of local amenities and facilities, and citizens' anti-social behavior drive attention to neighborhoods with a social construction (Reiner, 2003). The gap between the environmental components and social activities in neighborhoods will ultimately lead to the lack of public-gathering and a sense of not belonging to the place. Therefore, social capital could act as a useful strategy to link social-physical factors together. The ordinary design usually neglects social capital. Furthermore, social bonds and social interactions that directly affect lifestyle and the built environment modalities have been overlooked.

Although the contemporary design policies in residential areas intend to establish residential satisfaction, assuming models for social interaction and facilitating pleasant experience (Wang & Wang, 2016), a comprehensive model of social capital in residential neighborhoods need to take practical steps in planning and design. In this study, the social capital parameters in residential neighborhoods are defined, and consequently, recognition and explanation of the design policies and strategies to improve social-physical dimensions in residential neighborhoods are considered. Moreover, according to the stated purposes, this study is aimed at taking a new look at these questions: (a) What changes have taken place in the concept of so-

cial capital over time? (b) Which components or parameters of social capital affect the physical-social construction of residential neighborhoods? And (c) What are the appropriate design criteria or strategies by the concept of social capital?

The present research applies a qualitative approach and consists of four steps; the first step focuses on the conceptual developments of social capital and its role in neighborhoods (literature review). It makes an attempt to provide a critical look into social capital as a concept and establish a logical framework. The second step is based on the analysis of the social capital theories. In this step, the social capital parameters which affect the physical and social dimensions of residential neighborhoods are elaborated. In the third step, a proposed model is offered to help form a logical structure by its linkage to the social capital dimensions and components. Finally, planning strategies and design criteria are accordingly recommended.

2. Social capital (background & literature review)

The origins of the term social capital go back to Hanifan (1916), who emphasized, in his discussion of community centers, the importance of community involvement revival for the continuity of democracy and development (Tavassoli & Mousavi, 2005). Hanifan emphasized the link between social capital and social relation so that social capital is considered to be hidden inside of the social relations (Ejtehadi, 2007). One of the important scholars who dealt with the concept of social capital in urban sociology is Jane Jacobs (1961) in her famous book entitled 'The Death and Life of Great American Cities'. She considered social capital as a result of social networks which form some parts of residents' daily life, such as the ordinary interactions between neighbors in a region (Jacobs, 2013; Tonkiss, 2015). Following Jacobs, numerous researches measured and evaluated social capital at the neighborhood scale. For instance, in Temkin & Rohe's (1998) study, social capital was highlighted as an influencing component of neighborhood dynamics and stability. Selman (2001) in

an article entitled 'Social Capital, Sustainability, and Environmental Planning' stated that successful participatory approaches based on social capital resources might lead to neighborhood sustainability. As Bashar and Bramley (2019) evaluated, poverty and proximity of living in the neighborhood act as important factors in promoting the components of residents' social capital. One of the practical studies in this field is Butler & Robson (2001) that surveyed social capital, gentrification and neighborhood change in London. Comparing three neighborhoods in south London, they connected the improvement of institutional and environmental infrastructures to the improvement of these neighborhoods, which results in the merging of cultural and social capital together. Another study in Britain by McCulloch (2003) stated that neighborhood structural attributions, such as population density and housing stability, affect social capital. In Scotland, a study conducted by Flint & Kearns (2006) revealed that creating high-quality environments in the development and management of social housing will enhance social capital, ultimately leading to social interaction and a sense of belonging.

In addition to Britain, numerous studies were carried out in the Netherlands. The research directed by Kleinhans et al. (2007) is notable in evaluating the two restructured neighborhoods in Rotterdam. They analyzed the relations of social capital and urban regeneration in improving the physical quality of urban neighborhoods and the citizen's social well-being. Another research by Dekker (2007) identified that social capital and neighborhood attachment were effective concepts in increasing resident's participation. Ethnic diversity also tends to be important in resident participation. For instance, Vermeulen et al. (2012) in their research in Amsterdam found out that ethnic variation acted as a contributing factor to the lack of local social networks. In another research, Hoogerbrugge and Burger (2018) examined the relation between neighborhood social capital and residents' life satisfaction in Rotterdam. The results of this study indicated a significant relationship between social

cohesion and life satisfaction. The investigation on the impact of social capital on the residents' satisfaction and a positive perception of neighborhood quality by Kleinhans (2009) in two reconstructed areas showed that newcomers to the neighborhood have relatively high levels of social capital.

Considering many studies in social capital, Wood & Corti (2008) classified the relationship between social capital and the physical environment in three domains: First, Macro-level is the first category of contextual trends studying subjects, including crime, violence, neighborhood stability, and community adaptability capacity. Second, Meso-level explores the relationship between social capital and neighborhood characteristics and design, such as walkability and access to amenities. Third, Micro-level examines neighborhood-specific features to generate possibilities for social interaction, engagement in groups and activities, quality of the neighborhood and maintenance of a private and public environment, access to nature and greenery, and finally feelings of safety.

According to this classification, many papers investigated micro or macro-level issues in residents' social capital. For instance, Browning (2009) explained the downside of social capital as negotiated coexistence, property crime, and disorder in urban neighborhoods, arguing that increased network communication enhances the interaction between residents and according to studies in Chicago's neighborhoods this will reduce the impact of public monitoring and reduce crime. Kelly et al. (2010) reviewed the impact of social capital on violence. The results of their research in Mexican-American neighborhoods suggested that attention to social capital such as efficacy could improve a neighborhood's social-physical conditions. The role of citizen behavior in forming social capital was also measured. Cho and Kang (2017) pointed out that neighborhood social capital had a significant role in the behavior patterns of individuals in public or private environments. From their point of view, social capital could be achieved by the characteristics and quality of the social relationship between individuals.

The impact of environmental design factors on social capital was also discussed by researchers. For instance, Hanna et al. (2009) investigated social capital and quality of place in a small town. The results indicated that the characteristics of the spatial organization were directly related to the rise of social capital. The spatial elements can also support social capital by facilitating networks and developing the socio-economic opportunity. Mazumdar et al. (2018) identified a significant relationship between social capital and the built environment. In their survey, they concluded that the impact of neighborhood design features and the accessibility of facilities were positive on the social capital and negative on the neighborhood density. Muzayanah et al. (2020) examined the role of urban form in the formation of social capital in Indonesian cities. The results of their study indicated that the urban form could influence the parameters of social capital. They noted in the findings that in high residential density areas the level of social capital indicators was relatively low.

In addition to the aforementioned studies, Iranian scholars have also conducted many pieces of research on social capital that could be categorized into two different levels of scale: city and neighborhood. For instance, Honarvar et al. (2015) evaluated the components of social capital in the Iranian city based on the analysis of Old Persian texts. Referring to city evaluation, social networks were considered as a key component of social capital that influenced other components, so that the impact of these social networks could be observed through “inter-neighborhood links” to “reinforce cooperative norms” and “trust.” Mohseni Tabrizi & Aghamohseni (2011) in the city of Mahalat examined the role of social capital on urban development. They estimated the high level of social capital among citizens and the possibility of further urban development.

Adhami Sayadmahaleh (2014) explaining the role of public spaces and their relation to social capital. This study, conducted in the city of Amol, concludes that strengthening public spaces acts as a factor in improving the “qualitative level of social capital” and

ultimately “urban development”. Habib et al. (2013) also measured social capital in urban structures with an emphasis on public space in Tehran. The results showed that public places in the city could promote social capital in a structural and cognitive dimension. Indicators such as “feelings of security”, “trust”, “social participation”, “socialization” and “amount of interaction” can be used to evaluate social capital in the urban structure.

Barati & Yazdan Panah Shah Abadi (2016) evaluated social capital in promoting the quality of life for residents of the new City of Pardis. They emphasized the significant relationship between social capital and subjective quality of urban life. In this regard, we can point to the study of Vatankhah (2014) who emphasized the meaningful relationship between the promotion of social capital and the components of urban space quality. As well as in the neighborhood scale, Rastbin et al. (2012), in their studies in the Jolfa neighborhood in the city of Isfahan, confirmed the relationship between environmental quality components and the levels of social capital indicators.

The study by Mozaffar et al. (2013), pointed to the direct relationship between sociability and social capital. Reza-zadeh & Selseleh (2010) suggested the establishment of local social and physical capital led to sustainable neighborhood development, thereby improving the quality of life of neighborhood residents. In contradiction, Alizadeh et al. (2014) found, in an analyzed case study (informal settlements, old/central, and planned neighborhoods in Sanandaj city), that high levels of social capital did not improve the environmental quality of the neighborhood.

Nevertheless, as the literature review also suggests, most studies specifically measured social capital indicators in urban planning and urban designing just by considering dimensions such as social interaction or social participation. However, there is a theoretical gap which only suggests the limited indicators of social capital in studies, whereas the scope of social capital is beyond the above-mentioned indicators. In this paper, we investigate the dimensions of social capital as a whole phenomenon.

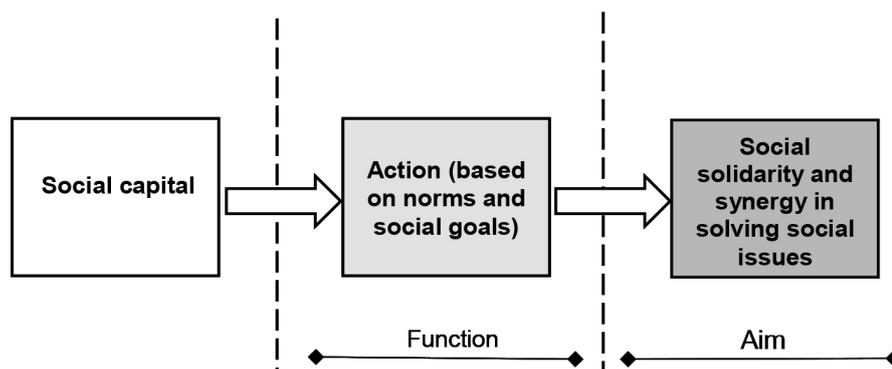


Figure 1. Aim of social capital.

2.1. Dimensions of social capital

Social capital is a paradigm that can combine across different disciplines and provide a framework in which the social environment characteristics of individuals are measured (McClain, 2016). Social capital is a result of communication between citizens and is, in effect, a potential that helps citizens through cooperation and participation to achieve shared goals (Stolle, 2003). In the meantime, communities will achieve desirable social goals in which factors and components of social capital are considered (Krishna, 2002).

Social capital emerges in a sustainable network of social interactions and can be defined as a change in the social structure whereby social actors will reach their goals (Rydin & Pennington, 2000; Lin, 2001b; Bridger & Alter, 2006). More specifically, the position of each individual or group in the social structure is their asset; that is, social capital (Burt, 2000 & 2005). In a prevailing conclusion, it could be stated that social capital seeks a public benefit, and it would be seen as a public good that supports targeted behavior in the community (Collier, 2002; Arneil, 2006; Fukuyama, 2007; Ejtehadi, 2007).

In general, it can be stated that social capital performance is action based on common social norms and goals, whose purpose, in principle, would be increasing synergy and solidarity among community members to solve social problems (Figure 1). In other words, social actors behave according to a purposeful action that has a collective interest and a common value, and ultimately one can expect the reproduction of social capital. Therefore, social capital has a function based on

goals and values that focus on social issues such as solidarity and synergy.

In the literature on social capital, four major approaches could be identified. The first approach refers to a critical or the Marxist subject in social capital theory, which is reflected in Bourdieu's theories. The second approach is the subject of the economic or the rational thread in social capital, which has been the subject of much discussion from Coleman's point of view. Although the third approach focuses on sociologists such as Lin and Portes, who point to the level of interaction and relationship between actors together in achieving social resources. The fourth approach is a political and democratic thread in social capital that is reflected in the writings of Putnam and Fukuyama (Grootaert et al., 2004; Lewandowski, 2008, p. 30).

Bourdieu (1980, 1986) and Coleman (1988, 1987) have more systematically introduced the term social capital. They considered social capital as a way of organizing social influences and emphasized the intangible character of social capital (Portes, 1998; Castiglione et al., 2008; Häuberer, 2011; Nanetti & Holguin, 2016).

The concept of social capital in the Coleman and Bourdieu approaches had two key dimensions. Primary is the structure of the relationship between individuals, which had been embedded in social networks and allows a person to access resources. In this frame, features of social participation becomes clear. The second considered the sources of social capital in a way that increasing access to these resources could lead to the individual benefit and ultimately improve the quality of

life (Portes, 1998; Healy & Hampshire, 2002; Arneil, 2006; Koniordos, 2008). Bourdieu considered the social capital generation based on frequent relationships of the people in social networks, which will increase the mutual recognition and awareness of each other (Koniordos, 2008). For Coleman, this relationship is shaped by the collective essence of social capital and by factors such as trust, expectations, and mutual obligations amongst individuals (Castiglione & et al., 2008; Nanetti & Holguin, 2016).

Another scholar in this field is Putnam; He considered the main purpose of the social capital concept as to strengthening social cohesion (Putnam, 2013). Putnam emphasized social networks of commonly beneficial relationships (DeFilippis, 2001). In his interpretation, networks of public engagement lead to neglecting social gaps (Putnam, 2013). Social capital due to democracy is a “civic virtue” that could be generalized to society. Social capital would be thought of as a source rooted in social networks, which was created by mechanisms such as shared norms and trust (Burt, 2005; Kayahara, 2006; Lin & Erickson, 2008; Nanetti & Holguin, 2016).

Portes (1998) claimed that the “heuristic power” of social capital comes from “consequences sociability”. Field (2013) defined social capital as the link between individuals and the importance of shared values such as trust. “The key issue here is that social capital serves as a possible resource that can increase people’s capacity for achieving their goals by ensuring the cooperation of others” (Field, 2005, p. 6).

As a quick summary, Table 1 presents some other viewpoints of the main key theorists from Marx (1916) to McClain (2016). In this table, the definitions of social capital are classified based on two structural and cognitive approaches by applying Uphoff’s (2000) division. Uphoff divided social capital into two “structural” and “cognitive” dimensions; the structural dimension refers to “relationships” and “networks” and the cognitive dimension rely on intangible mental factors such as shared values and behavioral norms (Colletta & Cullen, 2002; Groo-

taert & Bastelaer, 2002). The structural approach in Table 1 refers to the tangible features resulting from the relationships that have emerged in social networks, and the cognitive approach refers to mental elements such as values, trust, beliefs, and so on. This distinction is based on the main emphasis of key authors and theorists on the definitions given in Table 1.

Three general issues can be deduced from these definitions. First, some of the social capital definitions act as the base for achieving a collective goal, whether political, economic, or social. Second, what has changed in the definition of theorists over time is the usage of this concept as to how it can be employed to solve social problems and social development (Grootaert & Bastelaer, 2002; Dhesi, 2000; Fukuyama, 2001; Krishna, 2002). In this respect, social capital is often represented in a positive aspect. Third, social capital is a process-oriented phenomenon. Some scholars consider the formation of this process as the result of cognitive forms such as norms and trust (Donati, 2014; Fukuyama, 2001; Brehm & Rahn, 1997), while others consider it as the structural attributes of social relationships and networks (Häuberer, 2011; Woolcock & Narayanan, 2000; Rose, 1998).

2.2. Components of social capital

The constitution of the social capital is dependent on cultural and social context (Krishna & Shrader, 2002; Young, 2014). As such, in addition to defining the content of this concept, we need to have contextual components for measuring social capital (Lin et al., 2001). Theorists and scholars in this field have put forward several components, among which we can identify four main categories that are common in the literature review of social capital: (a) social networks, (b) shared values and norms, and (c) trust, each of which will be discussed below.

2.2.1. Social networks

They are the resources by which possibilities would be afforded to create social benefits (Meyerson, 1994). In fact, networks facilitate social participation and communication (Lin,

Table 1. *The social capital concept from the key theorists' viewpoint.*

| Author/s | Year | Definition of social capital | Approach |
|--------------------|-----------|--|------------|
| Marx | 1867 | Capital in Marx's theory has a social meaning; since the production and creation of capital requires a process in which relation and social activity play a central role (Mousavi & Shiyani, 2015; Lin, 2001b; Häuberer, 2011). | Structural |
| Schiff | 1992 | Social capital can be defined as the set of elements of social structure that affect relationships among people and are inputs or arguments of the production and/or utility function (Schiff, 1992, p.160). | Structural |
| Burt | 1992-2005 | The benefits of social relationships that are achievable in the structure of social networks are defined as social capital. Burt regards social capital as the capacity available to individuals and groups that provides an opportunity to use other types of capital (Burt, 2005). | Structural |
| Newton | 1997 | Social capital may be understood and defined in terms of (a) norms and values (b) networks, or (c) consequences-voluntarily produced collective facilities and recourses (Newton, 1997, p.575). | cognition |
| Brehm & Rahn | 1997 | Social capital is an aggregate concept that has its basis in individual behavior, attitudes, and predisposition (Brehm & Rahn, 1997, p.1000) | cognition |
| Sandefur & Laumann | 1998 | The theory of social capital investment is based on advantages, rather than forms; social capital is dependent on the goals of social actors and can create the capacity to achieve individual and collective goals and interests (Sandefur & Laumann, 1998). | Structural |
| Rose | 1998 | People-to-people relationships form the core of social capital issues; social capital is the result of investing in formal and informal social networks that individuals use to allocate benefits or services (Rose, 1998). | Structural |
| Serageldin | 1998 | Social capital refers to the institutions, relationships, and norms that shape the quality and quantity of an individual's social interactions (Aguilar & Sen 2009, p.425). | Structural |
| World Bank | 2000-2001 | Social capital is a strategy to eliminate social problems and reduce poverty. The World Bank views social capital as a stimulus for economic development (Grootaert & Bastelaer, 2002). | Structural |
| Dhesi | 2000 | Social capital is largely inherited from generation to generation. It evolves through repeated interactions, which permit the buildup of trusts and norms (Dhesi, 2000, p.202). | Structural |
| Woolcock & Narayan | 2000 | Woolcock and Narayan discuss social capital in the context of economic development policy. Social capital is based on the relationship between individuals at different levels of society that enables them to act collectively (Woolcock & Narayan, 2000). | Structural |
| Lin | 2001 | Social capital is a shared asset based on individual relationships and has an interactive character that encompasses the collective benefit of individuals (Lin, 2001a; Häuberer, 2011). | Structural |
| Fukuyama | 2001 | Social capital is an "informal norm"; promoting social capital contributes to economic growth and the stability of democracy (Fukuyama, 2001). | cognition |
| Krishna | 2002 | Social capital is the potential derived from 'quality among relationships' within society and the goals of 'collective action' are reciprocal and beneficial (Krishna, 2002). | Structural |
| Paxton | 2002 | Social capital requires (1) objective associations among individuals, and (2) associations of a particular type-reciprocal, trusting, and involving positive emotion (Paxton, 2002, p.256). | Structural |
| Manderson | 2010 | Social capital has proven a strong concept in explaining the productive effects of relational and affective ties, explaining and enabling community inclusion, collective identity, and mutual support (Manderson, 2010, p.233). | Structural |
| Häuberer | 2011 | Social capital is a phenomenon resulting from social relations that depend on social structure (Häuberer, 2011). | Structural |
| Donati | 2014 | Social capital can be generated through trust, cooperation, and interaction that arises between people in society. Social capital is the product of public good relations (Donati, 2014). | cognition |
| McClain | 2016 | Social capital refers to the consideration of networks and the relationship between individuals (McClain, 2016). | Structural |

2001b). Social networks are one of the main pillars of social sustainability and act as a medium for social capital transfer (Gandelonas, 2010). Unger

and Wendersman (1985) categorized social networks created in a neighborhood as contributing to individual well-being and quality of life so that

the merging networks are the context for social interaction between neighbors in the neighborhood area (Unger & Wandersman, 1985).

2.2.2. Shared values and norms

Norms are the base for understanding people's behavior in their social environment (Giddens & Birdsall, 2015). Norms act according to the social structure and the interests of the individuals. In principle, the agreement of individuals on norms and values provides a common context for synergizing activities (Coleman, 1988; Graeff, 2009). In other words, shared norms provide the capacity to achieve coordinated collective action (Nanetti & Holguin, 2016). Shared values and norms in a positive sense are the acceptance of diversity and common understanding among members of society (Piran, 2013). Shared values and norms are cognitive components that can act as a bridge to social organization and social order among people. It may be argued that social capital is readily available in homogeneous societies, but the role of diversity and variety should also be clarified. Diversity can shift the behavior among social actors to a social gap and enable social groups to act so as to solve social problems. Giddens and Bardsal (2015) state that in a homogeneous society, there is a possibility of conflict between values. Cultural diversity that conflicts with shared values and norms can be seen as a factor and an opportunity to change societies.

2.2.3. Trust

Trust is a way that people adapt to their social environment (Mironova, 2015, p.122). The high degree of trust could permit a wide variety of social relationships (Fukuyama, 1995, p.27). Trust among citizens improves when cooperation takes towards a specific goal (Ostrom & Ahn, 2009). The sense of trust connects public and private boundaries and stabilizes social relationships (Evans, 1996). In neighborhoods, the trust will provide an environment where neighbors could easily communicate with each other and behave in ways that promote beneficial social interactions (Temkin & Rohe, 1998).

3. A model for social capital in residential neighborhoods

The physical environment is a reflection of the actions and behavior of users, which results in place-making according to its constitutive criteria. Therefore, the concept of social capital could be considered as one of the approaches that provide a dynamic and continued interaction between the physical dimension and social aspects. Furthermore, it will bring about place-making. Figure 2 proposes a model as a solution to promote social capital in residential neighborhoods. This model can be a basic guide for researchers, professionals, and city policymakers. By using this model and adapting it in different urban environments and conditions and different cultures and climates, it is possible to achieve a base for comprehensive and holistic decisions in social capital in residential areas. The parameters presented in this model are important for the physical-social dimensions because, in the residential neighborhoods, the co-existence of these two dimensions next to each other has been neglected. In this regard, perhaps this proposed model could also be considered as a breakthrough in the design and planning of neighborhoods.

By analyzing the concepts and components of social capital and its dimensions in urban studies, four parameters, namely a) social interaction, b) social participation (social dimension), c) place attachment, and d) spatial equity (physical dimension) are presented in this suggested model. These expressed parameters somehow imply the components of social capital. For example, trust, which is one of the basic components of social capital, could be redefined in the social interactions and participation of citizens that have emerged in urban space and the public realm. Beneficial social interactions will not practically emerge without effective trust between residents. In other words, trust forms the basis for the formation of social interactions or even social participation in a joint issue that pursues the public interest.

The indicators of social capital or any social action need a context for expression, but this context must have conditions. Perhaps the component of spatial

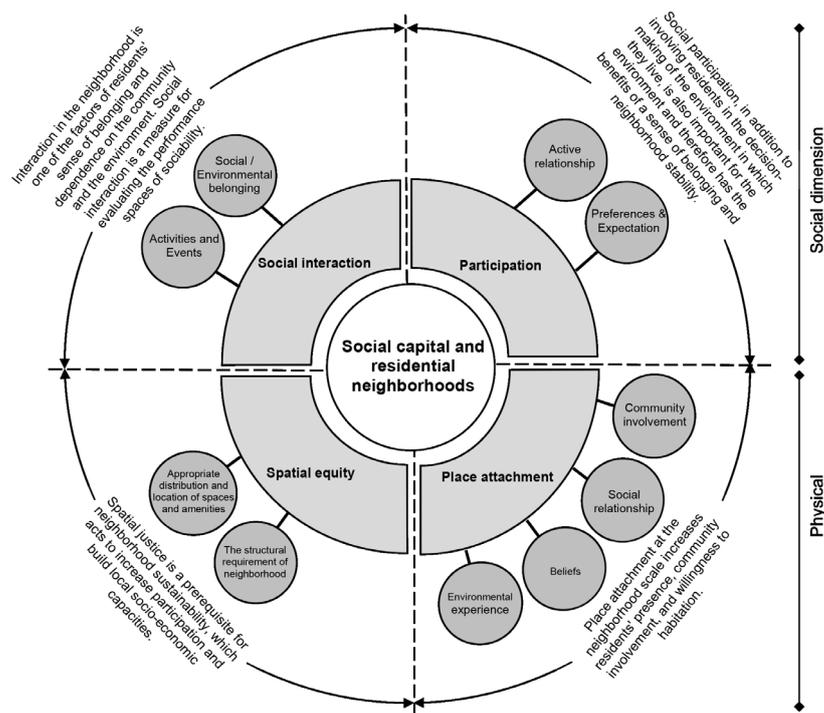


Figure 2. A Model for developing social capital in residential neighborhoods.

equity and place attachment according to the criteria that will be addressed further in its definitions is the most appropriate expansion of the relationship between social-physical dimension that will achieve the reproduction of social capital in residential neighborhoods. It seems that in place attachment and spatial equity, the indicators of social capital are among the driving principles. Shared values and social relations in networks lead to the connection of people with place, and wherever the conditions are physically and socially equal and balanced for people in society, the level of this connection will increase. In fact, the intervention and preference of people in the community to improve the condition will increase due to the importance of the environment.

In the model (Figure 2), it should be stated that the social interaction component is based on social activities and events that provide a common context for residents to communicate in the environment and on the other hand, the component of social interactions will be strengthened due to the environmental and social dependence of residents in a sociable environment. It should also be noted that the component of place attachment requires the community involvement and social interaction of

people in a neighborhood. If a person's positive experiences of the environment as well as common beliefs and values of individuals shape by the place attachment, the two dimensions of participation and social interaction may also be strengthened. Ultimately, neighborhood sustainability may increase along with the mentioned dimensions.

This proposed model considers the social participation component to have two main features. The first is to establish active communication between residents and the second is the potential capacity to meet residents' preferences and expectations. These two characteristics can lead to the belonging and stability of people in the neighborhood. Through participation, residents find themselves involved in the process of improving and organizing neighborhood developments. Finally, the component of spatial equity presents the needs and expectations of residents from the environment that encompass them. The base for spatial equity is firstly the appropriate distribution of services and facilities and secondly meeting the structural requirements of the neighborhood such as public spaces, open spaces, etc. In addition to providing the above-mentioned items, this provides a context for the growth of

community involvement and social interactions, which also includes the ability to activate the economic potential of the neighborhood.

3.1. Social interaction

Social interaction, as a key parameter, provides the opportunity for improving the cohesion of the local communities as well as encouraging residents to come together for dynamic and participatory activities. On the one hand, the efficiency of social interactions by building a different level of neighborly relationships in “social control” and “social cohesion” has been approved (Browning, 2009). On the other hand, social interaction is an indicator of the social networks in the physical and social environment. Wherever the environmental parameters strengthen to empower the sociability of residents, there will be the possibility to upgrade any of the social capital indicators. The social relationships between neighbors increase the level of trust and help them achieve their common goals.

Social interaction is also a process of purposeful behavior of residents in a place shaped by informal everyday relationships, collective activities, and local events. The possibility of these behaviors at the neighborhood level provides the potential for local social networks to be more strengthened. It would be expected for the residents to support each other in resolving social contradictions and facilitating positive social actions. Relationships between residents in the place can develop the possibility of dependency and belong to the physical environment in which they live. It could be stated clearly that the characteristics of the place where the residents interact within would be restored in line with their needs and activities. Finally, the interactions between the residents constitute a network of relationships that lead to residents occupancy, bonding them with the place. In this respect, it is important to add the physical factors to make places more sociable, where the residents have a visit, meet, leisure and daily activities. Social interactions play a central role in place making, both affecting and influencing the conditions of the place.

3.2. Participation

Participation is a factor in the development of neighbors’ communication so that active communication could be considered as a participation measurement. Social participation enables people to trust the environment in a sustainable network of relationships. Residents’ participation in shaping the public and semi-private spaces of the neighborhood is a mechanism that can manage the preservation and verification of these places. Participation is a key factor in the evolution of public spaces (Hoskyns, 2014).

Social participation, in addition to recovering and modifying the physical environment, will also enable residents to be more stable and sustainable. Furthermore, residents’ participation in the neighborhood plays a decision-making role in constructing and shaping the physical environment. Participatory planning, designing, and policy development in the neighborhood will improve the professional’s ability in achieving environmental quality simply because the participatory approach takes into account the preferences and expectations of the residents. Besides, citizens in cooperation with each other may find their expectations objectively and can be expected to have a sense of belonging to their neighborhood and wish to participate in preserving it.

3.3. Place attachment

Place attachment is a cognitive and behavioral relationship among the people and places (Brown et al., 2012). Desirable environmental characteristics in terms of physical and social dimensions lead to place attachment over time. The neighborhood becomes more meaningful to the inhabitants through activity and social interaction, and likewise, the connection with the place takes shape. From the viewpoint of Kleinhans et al. (2007), high levels of place attachment will indicate (re) production of social capital among residents. Local groups and community centers are factors in facilitating attachment to the place. These social networks will expand the residents’ awareness and cognition of the environment (over time) and will increase the level of residents’ communication.

The public realm and behavioral territory which arises at the level of a neighborhood are a clear example of individual bonding with the environment. The public realm, like open spaces, in addition to providing social benefits such as attending events and activities for individuals, strengthens the social sense among individuals (Woolley, 2003).

Indicators such as neighborhood relations, community involvement, and residential satisfaction attach the neighbors to the place. More than the physical features, the social processes define the concept of place attachment, a process that supports and revitalizes public characters in a neighborhood. Beliefs, one's mental experiences of a place, social events, collective memories of symbols and signs will indicate the overlaps of social processes in place and lead to the place attachment. The spatial organization based on cooperation will preserve and reinforce important public places. It will increase residents' level of joint actions and environmental desirability. One becomes attached to a place wherever social-physical attractions are brought together in an environment. In other words, people become attached to the place when they experience the sense of being in place and perceive the place as their own.

3.4. Spatial equity

Spatial justice is followed by the "social justice array", a concept that directly depends on the perceived quality of the living environment. As can be assumed from Kunzmann (1988), the goal of "spatial justice" is to have "equal access" to local service and spaces. Equal access of people to urban spaces, especially public spaces, as stated by Gehl (2015), is a democratic dimension of social sustainability. Spatial equity increases a neighborhood's "socioeconomic capacities" as well as people's social participation. Spatial equity, like participation, pursues the common expectation of its inhabitants and focuses on equitable behavior within the community. In other words, the extended users' social activities, as well as the power of public intervention (sharing expectations), would be another outline of social support. Spatial equity will guarantee

local social capital development. Spatial equity is a process-oriented term. This process shapes the neighborhood structure over time through the collaborative interaction between residents and experts. The balanced combination of services and infrastructure at the neighborhood level, in addition to absorbing population, supply the presence of residents, so the possibility of communication and environmental satisfaction will also increase. In a macro view, spatial equity, in addition to having a structural perspective, possesses a cognitive dimension. Spatial equity indirectly compares the perceptions and experiences of people from other places as opposed to the conditions in which they live. Thus, wherever the dwelling qualities are evaluated from the perspective of residents in a desirable and equitable neighborhood, spatial equity would be reflected in it.

These four mentioned parameters in general form an integrated and interconnected cycle, in which users' presence remains as bases for social relationships and social network performance. Therefore, the main structure of this model is based on organizing social processes in residential neighborhoods and tends to be a solution for promoting social capital.

As can be seen from the findings of the study so far, the key structural parameters derived from the components of social capital and social network communication have been accurately or inaccurately studied before in residential neighborhoods. It should be noted that local social networks could be supported by the creation and development of places that promote civic activities and respect the goals of residents. These parameters have a basic structure and are indistinguishable from each other in such a way that their interconnections with the design and planning goals provide neighborhood sustainability and quality of life in both physical and social dimensions.

4. Planning strategies and design criteria

Strategies and designing tactics based on the parameters of participation and social interaction, place attachment & spatial equity can be stated as follow:

a) The strategies of creating and strengthening a public realm to achieve social interactions should be adopted. Public realms in neighborhoods are a socialized and valuable environment in terms of establishing social relationships that create vitality in the neighborhood. Providing and emphasizing the public realm in strategies can create a two-way interaction. On the one hand, it provides an area for residents where part of their daily life takes place, and in the meantime, it is possible to solve problems related to the conditions of the neighborhood through collective interaction. On the other hand, the public realm in residential neighborhoods can serve as a gateway for the presence and communication of other people living outside the neighborhood.

According to the mentioned strategy, appropriate design criteria can be expressed to ensure social interaction. Designing open spaces in the neighborhood, connecting the public realm with the main pedestrian axis and accessible networks, forming active frontage, homogeneous mixing land-use in the neighborhood, as well as the visible public spaces, improves the sociability and security of residents in the built environment. Designing and facilitating community spaces such as neighborhood centers, local parks, playgrounds, cycling paths, sports clubs, religious buildings, etc. will also provide twenty-four-hour social activities for residents and amazingly improve the opportunity for social occasions and events.

Lack of planning for the establishment of the masses at the neighborhood level will not only create visual unity but also prevent the visibility of public spaces and ultimately the lack of effective communication between residents in a neighborhood. Therefore, the emphasis on motion sequences and visual corridors that reinforce the public realm can be design criteria that indirectly affect social interactions.

b) The strategies for residents' participation in the management and construction of physical space may target the participation component. Part of the adopted strategy refers to

the transfer of neighborhood management to its residents which addresses the concerns of residents in the care, maintenance, and improvement of public-semi-private realms and open spaces of the neighborhood, and the part has to do with the participation of residents in the construction of new physical spaces from the planning to construction stage. Each mention of these sections will increase the potential for participation between residents. As this study declared criteria, such as creating connections between designers and residents for considering their expectations and preferences in the design process, the residents' decision making about abandoned public spaces as well as developing collaborative strategies for tenants to increase the level of participation, will increase the residents' willingness to attend and habit the neighborhood.

c) The strategy should consider the place attachment parameters to increase the presence of residents in the public realm and open spaces. Public realm and open spaces are the connection point that attracts residents due to the activities defined in it. When these areas are socialized, residents' interaction and community involvement can occur, and in addition to providing satisfaction, attachment between residents and the neighborhood can be imagined over time. Applying tactics such as involving residents in the development and construction of places as well as increasing residents' relationships in public and semi-private spaces is aimed at achieving place attachment. If neighborhood programming bases its foundation on the residents' lifestyle, designing and revitalizing local landmarks, creating focal points in the neighborhood, and paying enough attention to the local architecture, then it would be possible to prepare strategies that increase the level of sense of belonging to the neighborhood.

d) The strategies for proportional distribution and location of spaces and services are crucial for spatial equity, the balance between activities and the appropriate distribution of areas and places in addition to forming the structure of a neighborhood.

It provides a suitable context for the development and growth of the other three components of social capital. Spatial equity is a mechanism for organizing the physical changes of the neighborhood and provides residents with maximum access to amenities (over time).

Planners and designers should pay more attention to set an appropriate space between public and residential zones. They should try to prepare more pedestrianizing neighborhoods, linking pedestrian networks to public spaces, provide proper access to public transport, and consider essential infrastructure and appropriate services in the physical environment design. These can all indicate a high level of spatial equity. It should be noted that even on a more limited scale, spatial equity would be achieved by creating retail outlets such as coffee shops and street shops in the neighborhood. In addition to meeting the requirements of residents, the local economy will thrive. Furthermore, eliminating inappropriate land uses that may cause basic changes in the neighborhood in long and short periods may have a positive impact on shaping neighborhood spatial equity. Flexible spaces that provide the future development of the neighborhood, in addition to inducing a dynamic quality to the neighborhood, may be able to meet the requirements of neighborhood spatial equity over time according to the socio-economic context.

5. Conclusion

Social capital is a paradigm that has a public character and pursues community interests based on their goals and behavior. Trust, common norms and values, and social relations that arise through these components in social networks can be considered as sources of social capital. The richer these resources are among the members of a society, the more able individuals will be to achieve more social capital. Social capital is also a factor in social life as well as a kind of public synergy in solving social issues. Social capital may also be considered as one of the main factors in a society's urban (re)development, a capital that is built on a variety of sustainable relationships in society. Central findings of this

study support Putnam's theoretical view of creating social networks to generate social capital. Based on the structural aspect of this approach and attention to social processes in the environment, urban designers and planners can provide a framework for developing social capital. Applying the social capital approach in residential neighborhoods can be considered as a solution that, in addition to responding to social problems and dimensions, provides a capacity that has an impact on the quality of physical space.

Social capital parameters in planning and designing neighborhoods stay in line with the preferences of the residents' public interests. Access to social capital resources in neighborhoods will have outcomes such as life quality, social solidarity, and sustainability. The present study divides social capital parameters in residential neighborhoods into physical and social dimensions, including social interaction and participation (social dimension), place attachment, and spatial equity (physical dimension). The parameter of interaction and social participation in neighborhoods, in addition to strengthening the connection and stability of residents with their place, provides an opportunity for residents to meet their needs and expectations from the physical environment around them. Place attachment can be viewed as a scale that is the result of combining social-physical processes side by side. In other words, social attractions and activities along with environmental characteristics connect people with place. But spatial equity in the proposed model is regarded as a key parameter that achieves socio-economic potentials in residential neighborhoods. In fact, spatial equity provides adequate access for all residents to the spaces and services required by the neighborhood.

It should be noted that urban studies researchers have more seen the parameter of interaction and participation to achieve social capital, and they have less dealt with place attachment and spatial equity. However, in this study, by analyzing the data from the concept of social capital and its components, the four parameters mentioned together have formed an integrated process to promote social capital, and therefore

the parameters have an internal relationship with each other. The proposed model can be considered in two ways. First, this model provides a better understanding of the concept of social capital and its promotion in residential neighborhoods. Second, given its parameters, the proposed model can be a structural solution to eliminate the physical-social deficit of residential areas. It can be clearly stated that each of these parameters is directly related to the elements of social capital (social networks, common values and norms, and trust). Therefore, it should be emphasized that raising the level of each indicator means developing social capital. The model of social capital introduced in this research is also based on these four main pillars and can be a basic premise for theoretical and practical work. As it is obvious, measuring each of the parameters is required to examine it directly in the cultural, social and physical context of residential neighborhoods because the conditions of each context to strengthen and use social capital indicators will be different.

Therefore, further studies focusing on these parameters may employ the concept of social capital and its impact on the physical environment and can measure and evaluate neighborhood satisfaction. Considering the challenges that arise at the community level is likely to further highlight the concept of social capital and its parameters. For instance, the current pandemic of the coronavirus (Covid-19), affecting urban spaces, social interactions, individual social distance and in general residence lifestyles especially in neighborhoods and communities is one of the most important issues in social capital studies in years ahead. Perhaps it is critical that the concept of social capital and its parameters be revised or manipulated to suggest a more practical solution in future.

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