Participatory Neighborhood Revitalization Effects on Social Capital: Evidence from Community Building Projects in Seoul

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Abstract: Neighborhood revitalization projects have been implemented to improve both the physical and social environments of deteriorated communities. The purpose of this study was to evaluate the impacts of government-sponsored community building projects (CBPs) in Seoul, Korea, that aim to revitalize declined communities through resident participation on the social capital of their inhabitants. The present study compared survey data collected from 12 completed CBPs and matched communities of similar size and demographic characteristics using structural equation modeling. The analysis identified a significant effect of CBPs on certain dimensions of social capital. For instance, the cognitive and trust dimensions of CBP residents tended to be higher than those of inhabitants of the matched communities. However, there was no evidence of significant differences in the social behavior dimensions of social capital between the two groups. The results imply that, although the influence of CBPs on some dimensions of social capital is limited, the participatory process initiated in CBPs encourages interaction among residents, thereby contributing to the improvement of social capital. **DOI: 10.1061/(ASCE)UP.1943-5444.0000416.**

Introduction

Over the past few decades, criticism of conventional top-down urban developments, undertaken through closed decision-making processes, has led to new urban design and planning approaches, such as neighborhood revitalization, sustainable development, and new urbanism, which have incorporated horizontal, inclusive, and participatory processes (Larsen 2005; Zheng et al. 2014). Despite the different characteristics of each new approach, public participation is a common component among them. For instance, new urbanists urge the public to take part in design processes (Bohl 2000). Also, the involvement of the local community and the promotion of sustainable development are indispensable for enhancing resident participation in the coordination of public programs (Fordham 1993).

In Seoul, South Korea, many low-income neighborhoods have deteriorated because of a lack of proper maintenance and investment. The major urban development approach to those deteriorated communities has been large-scale, top-down redevelopment that completely tears down old neighborhoods and replaces them with high-rise, modern apartment buildings. However, a new trend of incremental development involving public participation has become widely accepted as an alternative or complement to large-scale development ever since the decline of Korea's real-estate market. After Wonsoon Park was elected as mayor of Seoul in 2011, a small-scale grass-roots approach called The Community Building Project (CBP), implemented through specific projects in selected neighborhoods, became a new urban regeneration paradigm.

The aim of the CBP is to improve the physical environment and communities in deteriorated neighborhoods and maintain existing urban fabrics. Individual CBPs incorporate resident participation in regeneration processes by organizing resident councils. The participatory planning process of CBPs is expected to encourage social interaction and activity in these communities and, moreover, enable residents to actively and independently manage and maintain their own neighborhoods. However, little empirical research has investigated the impact of participatory planning on social aspects of communities. The present study focused on social capital, which is a concept commonly used to explain residents' social activities and relationships, by comparing the social capital level of residents in Seoul's CBPs with those in matched neighborhoods. Because Seoul has a relatively short tradition of participatory planning, the evaluation of CBPs can provide policymakers and planners with valuable insights into the strengths and weaknesses of this approach. Hence, the broader goal of this study was to shed light on effective urban regeneration approaches that can be used in future policymaking and planning.

Following this introduction, the next section reviews relevant theories and empirical studies. The third section introduces the quasi-experimental design, data, and analytic approach of the present study. The fourth section describes the results of the analysis, and a final section concludes by discussing the implications of the findings.

Theoretical, Empirical, and Analytical Background

Social Capital

Definition of Social Capital

Over the past 20 years, social capital has become one of the most popular topics in the social sciences (DeFilippis 2001).

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Table 1. Four Dimensions of Social Capital (Data from Perkins and Long 2002)

Form of social support	Form of perceived control	
	Cognition/trust	Social behavior
Informal	Sense of community	Neighboring
Formally organized	Collective efficacy	Citizen participation

Loury (1976) first introduced the term in a paper titled, "A dynamic theory of racial income differences," to represent the relationship between social position and the acquisition of standard human capital characteristics, after which many scholars—such as Bourdieu (1986), Coleman (1988), and Putnam (1993, 1995)—developed the concept of social capital and redefined it. Among them, the authors noted Putnam's definition on social capital (Putnam 1993): "Social capital refers to features of social organization such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit. Social capital enhances the benefits of investment in physical and human capital." Despite opposition to his definition and research, Putnam notably recognized social capital as being constructed of measurable individual variables (Foley and Edwards 1999; Jackman and Miller 1998).

Because research on social capital has spanned across the social sciences, such as political science, sociology, economics, management studies, and even the health sciences, its definition has varied depending on the field (Adler and Kwon 2002; Akçomak 2011). At the time of writing, Akçomak's paper, "Social capital of social capital researchers," noted that more than 2,500 papers had been published in the social science citation index (SSCI) on social capital from 1977, but that indiscriminate usage of the concept made its meaning ambiguous (Akçomak 2011).

Thus, this paper specifically adhered to the definition of social capital commonly used in the field of community psychology (e.g., Long and Perkins 2007; Perkins and Long 2002; Sanoff 2006). The authors operationalized social capital on the basis of Perkins and Long's (2002) four dimensions: (1) trust in one's neighbors, (2) trust in the efficacy of organized collective action (empowerment), (3) informal neighboring behavior, and (4) formal participation in community organization (Table 1).

Sense of Community

Sense of community has been used widely as an indicator of quality of community life and a catalyst for the behavioral dimensions of social capital (Beckman et al. 1998; Chavis and Wandersman 1990; Hughey et al. 1999; Perkins and Long 2002; Wandersman and Giamartino 1980). McMillan and Chavis (1986) proposed the following definition: sense of community is a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together. The essential components of community can be defined as mutual interdependence among members, a sense of belonging, connectedness, spirit, trust, interactivity, common expectations, shared values and goals, and overlapping histories among members (Rovai 2002). Empirical studies have investigated the relationship between sense of community and other factors, such as community satisfaction, collective efficacy, neighboring, communitarianism, informal social control, fear of crime, litter, graffiti (Perkins et al. 1990), and participation and common land investment in home and community building (García et al. 1999; Perkins and Long 2002; Prezza et al. 2001).

Collective Efficacy

Perceived collective efficacy is not simply the sum of the perceived efficacy of individual members; it is also an emergent group-level property because social cognitive theory extends the concept of human agency to collective agency (Bandura 1997, 2001). Furthermore, perceived collective efficacy promotes a group's motivational commitment to its mission, resilience to adversity, and performance accomplishments (Bandura 2000). Additionally, Sampson et al. (1997) defined collective efficacy as social cohesion among neighbors combined with their willingness to intervene on behalf of the common good, and regarded collective efficacy as informal social control and mediator of social composition. Duncan et al. (2003) agreed with their definition and conducted research to clarify the relationship among neighborhood-, family-, and individual-level variables, and perceptions of neighborhood collective efficacy. The study indicated that age at the individual level, marital status at the family level, and poverty and perceived gang activity at the neighborhood level anticipated the degree of neighborhood collective efficacy (Duncan et al. 2003).

Neighboring

Neighboring includes two behavioral elements of neighbor attachment: informal mutual assistance and information sharing among neighbors (Woldoff 2002; Perkins and Long 2002). One form of neighboring is routine daily interaction (Woldoff 2002). Another form of neighboring is friendship-oriented interaction, which represents deeper interaction among neighbors (Woldoff 2002).

Citizen Participation

Several studies in the fields of sociology and political science have researched civic participation, concentrating on the association between citizen participation and demographic predictors of that participation (Perkins and Long 2002). Citizen participation, as a formal social capital behavior, occurs in blocks, neighborhoods, building associations, faith-based community services or advocacy committees and coalitions, school-based associations, and other grassroots community organizations (Perkins and Long 2002). Urban planners often disregard public participation and, likewise, citizens have shown limited interest in policies related to urban planning (Berry et al. 1993; King et al. 1998). However, citizen participation is very important to ensure that enduring plans are produced (Brody et al. 2003; Healey 2015) because citizen participation can raise trust, credibility, and commitment regarding the implementation of policies and, thus, build social capital (Brody et al. 2003; Burby 2003; Innes 1996; Innes et al. 1994).

Community Building Projects and Social Capital

Community Building Project Practices in Seoul, Korea

From the 1950s to 1990s, Korea's authoritarian central government focused its urban planning initiatives on economic development and industrialization (Lim 2000). Only a few chief policymakers and scientific professionals played a significant role in this government's urban planning processes and public policy decision making (Kim 2015). These processes did not incorporate resident participation, which meant that many became victims of ruthless urban redevelopment in which bulldozing and ground clearing preceded the construction of high-rise apartments.

From 2000, the central and local governments sponsored projects, including CBPs, aimed at participatory neighborhood revitalization. The key models for these projects are the urban village in the United Kingdom, new urbanism in the United States, and Machizukuri (meaning community planning) in Japan, all of which aim to create community through physical and environmental revitalization, and social regeneration (Park and Lee 2013). Korea's projects also are aimed at recovering a sense of community,

conserving architectural heritage in the town, and rehabilitating low-income housing.

In response to the increasing support of the national government and society, the city of Seoul initiated a series of participatory CBPs with different titles: Bukchon Regeneration Project (2000), Livable Community Building Project (2008), Seoul Human Town Project (2010), and Participatory Residential Environment Improving Project (2012). Despite different names and periods of execution, they share several key characteristics: (1) encouraging residents to get involved in every procedure, (2) improving low-income housing, (3) initiation by local governments (Seoul City), and (4) attempting to conserve communities' cultural and historical sites.

Although the development of each project piloted by Seoul City has varied, each primarily consists of the following processes: (1) selecting sites through the application of a neighborhood, (2) confirming sites, (3) composing a resident union by conducting workshops for the regeneration plan, (4) initiating the regeneration plan, and (5) conducting the project and activating the community. Although each project is initiated by the local government, citizen participation is necessary for its completion. Residents take part in the development of their neighborhood's revitalization plan with government officials and professional planners. The plan is institutionalized, in the form of a district unit plan, through coordination with both the local government and residents. Furthermore, residents construct a resident organization to oversee many activities in the community after the local government executes the physical project; these could include expanding infrastructure and building community facilities. This means that once physical plans are completed, CBPs continue through resident management. Residents have responsibility for both the oversight and maintenance of the CBPs. To encourage residents to participate, the local government gives residents a presentation about the project and provides various education programs to form social consensus among residents on their understanding of the project.

The other important factor in urban regeneration in Seoul is physical change (Park and Sohn 2013; Park et al. 2013). Community building projects' physical plans normally are implemented by specific design guidelines that consist of not only public-sector specifications, but also private-area specifications. Particularly, the private-area design guidelines specify building type, height, and color, and the design for the front yard and so-called green zone, which includes the entrance, parking area, and walls around the building. The public-sector design guidelines include improving the street environment, creating a town hall and small parks, and installing closed-circuit televisions (CCTV) and security facilities. Fig. 1 lays out the physical plan and character of the Amsadong neighborhood, in which the CBPs have been implemented. Also, because sites selected for CBPs are mostly poor and deteriorating, the local government provides low-interest loans for residents to promote housing renovation. These physical changes comprise a large part of the CBP process.

Participatory Community Building and Social Capital

Few studies have related participatory community planning to social capital. One study by Crawford et al. (2008) showed that community participation in planning and design helps to build social capital because shared time together and structured interaction can develop trust and a mutual comfort zone. Some studies on community development also have showed the potential of participatory community building to nurture the social capital of residents. Bridger and Alter (2006) argued that community organizations, aiming to accomplish specific tasks and pursuing a variety of interests with social interaction, provide residents with opportunities to take part in community activities, which makes it easy to cultivate healthy social capital. Moreover, analyzing the Crest Street Community in Durham, North Carolina, Rohe (2004) argued that social capital built at the neighborhood level can enhance not only interaction and trust among residents, but also the longer-term capacity of the residents to maintain their community. His study also illustrated that community residents can reinforce the level of social capital in their community by establishing an inclusive neighborhood organization with democratically elected leaders (Rohe 2004).

Earlier studies on the relationship between the built environment and social interaction offer another salient link between social capital and participatory community building. Eicher and Kawachi (2011) noted that informal social interactions, which are a significant part of forming social capital, rely on structural components of the built environment. This follows Jacobs's description of the city, in which casual interactions at the street level rest on street layout, building features, and even the width of sidewalks (Eicher and Kawachi 2011; Jacobs 1961). Additionally, Jacobs demonstrated that shared spaces—community parks and well-placed benches—that may enable interaction provide further examples of how the built environment relates to social capital (Eicher and Kawachi 2011).

Several physical plans, including small parks, community facilities, and public space improvement, have been investigated in previous studies. For instance, Cohen et al. (2008) reported that the presence of well-maintained parks increased collective efficacy within a half-mile community boundary because parks are regarded as community assets that attract and enable shared recreation and use of a space. The importance of parks also was supported by Lund's (2003) study, which showed that better accessibility to parks encourages pedestrian activity in a neighborhood, suggesting an increase in informal social interactions. A case study of suburban areas in northwest Columbus, Ohio, indicated that buildings with public spaces can increase a sense of community among residents (Nasar and Julian 1995). Additionally, improvements to public spaces by adding physical street elements, such as street murals, benches, and planter boxes, and engagement in the process of selecting aesthetic features, could enhance residents' social capital (Eicher and Kawachi 2011).

Conceptual Framework and Research Questions

The major goal of this study was to reveal the impacts of Seoul City's CBPs on social capital. This study examined the relationship between the implementation of CBPs and the four dimensions of social capital (i.e., sense of community, neighboring, collective efficacy, and citizen participation), controlling for the socioeconomic characteristics of residents (Fig. 2). Within this framework, the authors attempted to answer the following question: Do CBPs implemented through resident participation affect the social capital of those residents? Community building projects have aimed to not only improve the physical environments of deteriorated neighborhoods, but also recover communities, inspire participation among communities, and achieve enduring and consistent resident management. Thus, the authors anticipated that implemented CBPs increased the social capital of residents.

The authors also expected that the sociocharacteristics of CBP residents, such as gender, age, length of residence, housing ownership, and education level, affected their social capital. Especially with regard to the length of residence, the authors expected that the longer people resided in the neighborhood, the higher the level of their social capital because they may have had more opportunities to interact with their neighbors. In addition, previous research that has studied the four dimensions of social capital (sense of community, neighboring, collective efficacy, and citizen participation) suggested that the dimensions of social capital vary with

(a)

Physical Plan	The Experimental Area	The Controlled Area
Improving the street environment and the street network in the neighborhood	 (b)	 (c)
Building a town hall for community activities	 (d)	There is no community facility for the neighborhood
Removing wall to allow more green area and parking space through the private design guide line	 (e)	 (f)
Creating small neighborhood parks	 (g)	There is no small park for the neighborhood
Installing CCTV at the entrance of the neighborhood	 (h)	There is no facility for crime and security.

Fig. 1. CBPs physical of the experimental and controlled area in Amsa-dong (map data and images © Naver Corp): (a) location of the experimental and controlled area in Amsa-dong; (b) improving the street environment and the street network in the neighborhood (the experimental area); (c) improving the street environment and the street network in the neighborhood (the controlled area); (d) building a town hall for community activities (the experimental area); there is no community facility for the neighborhood; (e) removing wall to allow more green area and parking space through the private design guide line (the experimental area); (f) removing wall to allow more green area and parking space through the private design guide line (the controlled area); (g) creating small neighborhood parks (the experimental area); there is no small park for the neighborhood; (h) installing CCTV at the entrance of the neighborhood (the experimental area); there is no facility for crime and security

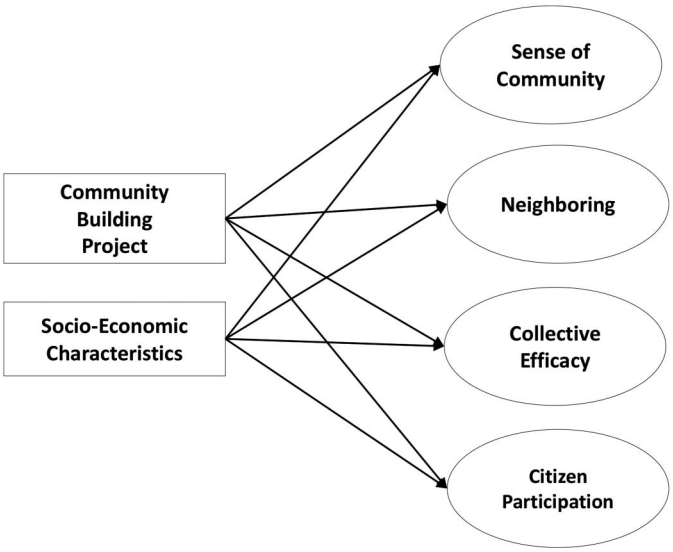

Fig. 2. Conceptual framework: social capital's dimensions and CBPs

socioeconomic characteristics (Perkins and Long 2002). Thus, the authors examined this relationship in detail.

Setting and Method

Context

Seoul is the capital of Korea and one of the most densely populated cities in the world. It occupies 605.25 km^2 and has a population of 10,575,447 (Seoul Statistics 2016). Seoul has 25 administrative districts, which have diverse urban forms on the basis of the specific purposes of their development. From 1950, district developments were initiated asymmetrically, focusing on the area above the Han River. Consequently, the level of development in each district varies, triggering divergences in land use configurations, building types, and deterioration levels. Hence, a variety of types of urban regeneration plans, including CBPs, have been implemented in dilapidated areas.

For this study, 24 of Seoul's neighborhoods were selected for a quasi-experimental and cross-sectional research design. The 12 neighborhoods selected for the experimental group have implemented CBPs initiated by Seoul City. These neighborhoods (and CBPs) are in 12 different administrative areas in Seoul: (1) Amsa-dong, (2) Yeonnam-dong, (3) Insu-dong, (4) Banghak-dong, (5) Samseon-dong, (6) Seongbuk-dong, (7) Siheong-dong, (8) Bukgajwa-dong, (9) Heukseok-dong, (10) Gilreum-dong, (11) Onsu-dong, and (12) Yeomni-dong (Fig. 3). For instance, the CBP of Yeomni-dong recently piloted a program called Salt Way to revitalize a deteriorated neighborhood. The Salt Way project, initiated by the Design Policy Department of Seoul City, prompted participatory planning through surveys, interviews, and three public hearings (Thorpe and Gamman 2013). Its core plan is to build an actively designed fitness circuit passing through crime hotspots (Thorpe and Gamman 2013). Various physical components of the Salt Way project, such as installing CCTV, drawing murals, and forming a small park and community facility, were developed through resident participation.

For the control group, the authors selected 12 matching neighborhoods near the CBPs in the experimental group. The selection criteria for the matching neighborhoods were proximity to a neighborhood with a CBP, similar socioeconomic characteristics (e.g., income level, education level, and average age), similar physical environmental characteristics (e.g., building types and land use), and the size of the matched neighborhood in the experimental group. Researchers carried out field studies for two months (April and May 2015) in these neighborhoods and conducted research on their surroundings to check for the existence of the main elements of the CBP, such as wall paintings, wall removal, public space development, parks, and other community facilities. Fig. 1, previously noted, displays the comparison of Amsa-dong, one of the CBPs, with its matched community.

Survey Design and Data

To measure the social capital of residents living in the selected neighborhoods, the authors developed survey questions (Table 2) on the basis of previous survey instruments (e.g., Kwak 2008; Perkins and Long 2002; Sampson et al. 1997; Woldoff 2002). In particular, the authors modified Kwak's (2008) questions to develop and test a survey instrument for social capital in Korea. Specifically, sense of community, one of the four dimensions of social capital, was covered by six questions modified from a measurement scale of community psychology and lists assessing trust with neighbors (Kwak 2008; Perkins and Long 2002; Sampson et al. 1997; Woldoff 2002). Neighboring is represented by six questions extracted to evaluate routine and social neighboring (Kwak 2008; Woldoff 2002). To assess collective efficacy, the authors used Sampson's et al. (1997) definition of informal social control, which is residents' willingness to intervene on behalf of the common good. Although Sampson et al. (1997) used the measurements of informal social control, social cohesion, and trust to assess collective efficacy, the authors of this study focused on informal social control because social cohesion and trust are very similar to sense of community (Kwak 2008). To measure citizen participation, a special module of the British General Household Survey, which inspected several facets of social capital in 2000 and 2001, was used (Coulthard et al. 2002). Four questions addressed citizen participation, assessing the degree of joining and intending to join neighborhood resident organizations, and the scope of responsibility and intention to meet responsibilities in those organizations (Kwak 2008). The authors expanded three- or four-item Likert scales in previous research (e.g., Kwak 2008; Perkins and Long 2002; Sampson et al. 1997; Woldoff 2002) to a five-item scale with the aim of ensuring consistency among survey questions. In addition, the socioeconomic characteristics of respondents, including gender, age, job, home ownership, length of residence, education, and income were included (Table 3).

Surveys were distributed door-to-door and gathered after a few days by trained survey agents. The advantages of this method are as follows: (1) the residence of respondents is clear, and (2) respondents have enough time to finish the survey without time pressure. The survey was conducted from May 23 to June 22, 2015. In each of the 24 neighborhoods in the experimental and control groups, 100 copies of the survey were distributed; thus 2,400 copies in total. After this process, a total of 580 surveys were collected, yielding a 24.2% response rate. Among the collected surveys, those that were incomplete or when social capital questions were unanswered were excluded. Thus, a total of 541 copies of the survey were used as the final dataset. However, in this sample, some socioeconomic questions remained unanswered (e.g., people tend not to answer questions about their monthly income).

Structural Equation Modeling

The challenge of measuring social capital is the concept's diverse and vague definitions. Some researchers (e.g., Perkins and Long

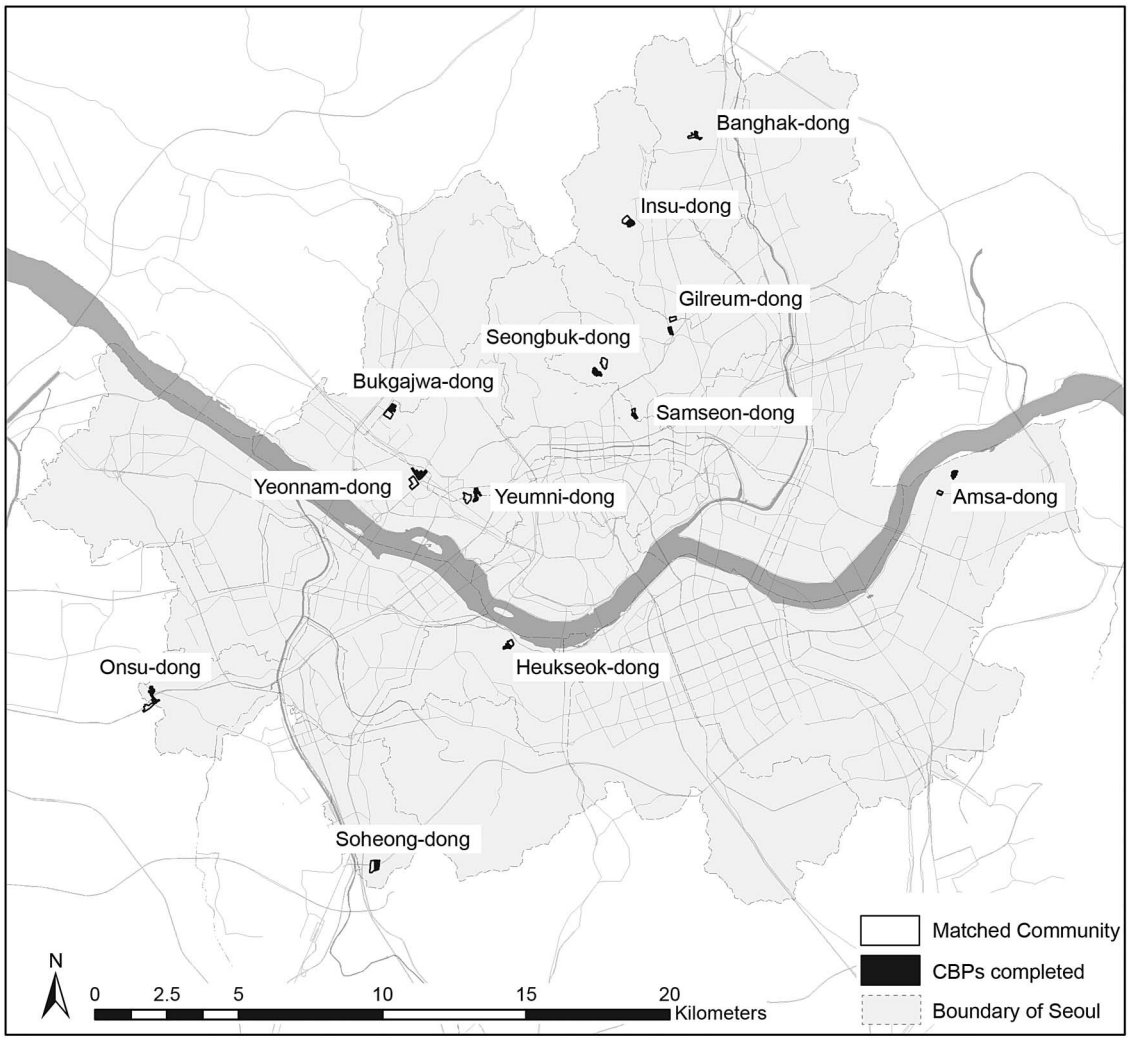

Fig. 3. Location of the experimental and control neighborhoods

2002; Narayan and Cassidy 2001; Forrest and Kearns 2001; Onyx and Bullen 2000; Temkin and Rohe 1998) thus attempted to assess social capital by identifying and measuring its dimensions. However, limitations of previous studies in measuring social capital include the latent nature of the social capital dimensions, which cannot be directly measured. Moreover, intermingled characteristics and dimensions of social capital make valid measurements difficult. For example, sense of community simultaneously is affected by neighboring and citizen participation (Perkins and Long 2002). Thus, simple regression models or hierarchical regression models cannot explain complex interactions among the dimensions.

This problem can be resolved through the use of structural equation modeling (SEM), an analytical tool first used to evaluate social capital in this field by Narayan and Cassidy (2001). Structural equation modeling is a sophisticated and powerful multivariate analysis technique used to examine the relationship between exogenous, mediating, and endogenous latent variables and control variables while accounting for measurement errors (Emhan et al. 2014). Thus, some recent studies on social capital have employed SEM to explain complicated relationships among various factors. For instance, Narayan and Cassidy (2001) and Emhan et al. (2014) used SEM to study social capital; however, their studies did not include the influence of neighborhood design. Also, few studies have employed SEM to interpret how participatory planning processes contribute to increasing social capital. The authors thus used structural equation models not only to analyze the relationship between social capital and participatory neighborhood revitalization, but also to understand the impacts of socioeconomic factors on social capital. The models in this study were estimated by using the command *sem* in the statistical software *Stata*.

Measures and Descriptive Statistics

Tables 2 and 3 display definitions and descriptive statistics of the key variables, and t-tests with unequal variance results that compare mean values between the experimental and control groups. On the basis of previous research (e.g., Kwak 2008; Perkins and Long 2002; Sampson et al. 1997; Woldoff 2002), 20 indicators were designed to measure four hypothesized latent variables: (1) sense of community with six indicators, (2) neighboring with six indicators, (3) collective efficacy with four indicators, and (4) citizen participation with four indicators (Table 2).

In the experimental group, all group means of social capital indicators were greater than those in the control group. Four out of five neighboring indicators in the experimental group had significantly greater mean values than those in the control group at the 0.05 alpha level. Three out of four indicators of collective efficacy showed statistical difference between the experimental and control

Table 2. Descriptive Statistics of Social Capital Indicators by the Community Building Projects and Matched Neighborhoods, and Tests of Differences

Underlying constructs	5-point Likert scale indicators (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree)	Total mean (S.E.) ($N = 536$)	Group mean (S.E.) Experimental group ($N = 272$)	Control group ($N = 264$)	Mean difference
Sense of community	I trust most people living in my neighborhood.	3.209 (0.034)	3.349 (0.044)	3.064 (0.051)	0.285[a]
	I do not need to be cautious around my neighbors.	3.399 (0.035)	3.511 (0.048)	3.284 (0.051)	0.227[a]
	Many people that I count on live in the neighborhood.	3.047 (0.039)	3.147 (0.055)	2.943 (0.056)	0.204[a]
	My neighbors will help me out when I need it.	3.052 (0.040)	3.143 (0.053)	2.958 (0.060)	0.185[b]
	When my neighbors engage in community work, I consider it my work, as well.	2.919 (0.040)	3.059 (0.055)	2.774 (0.058)	0.285[a]
	I would miss my neighborhood if I move away.	3.267 (0.043)	3.360 (0.059)	3.170 (0.062)	0.190[b]
	Average	3.149	3.262	3.033	—
Neighboring	I often chat with my neighbors.	3.062 (0.043)	3.210 (0.061)	2.909 (0.060)	0.300[a]
	I borrow or lend simple stuff or materials (sugar or tools) to my neighbors.	2.996 (0.047)	3.100 (0.067)	2.890 (0.065)	0.209[b]
	I often help my neighbors, and they also help me (e.g., car repair, house repair).	2.681 (0.044)	2.819 (0.060)	2.540 (0.064)	0.279[a]
	I often invite my neighbors to eat with me or otherwise spend time with me.	2.251 (0.042)	2.339 (0.059)	2.160 (0.059)	0.180[b]
	I often discuss important private matters (e.g., education, divorce) with my neighbors.	2.308 (0.043)	2.412 (0.059)	2.202 (0.062)	0.210[b]
	I often meet my neighbors outside of the neighborhood (e.g., watching movies, sports games, eating together).	2.287 (0.045)	2.338 (0.062)	2.234 (0.064)	0.105
	Average	2.598	2.703	2.490	—
Collective efficacy	If children or adolescents do not go to school and wander around the street, my neighbors will take action to help them.	2.886 (0.041)	2.952 (0.055)	2.818 (0.061)	0.133
	If children or adolescents carelessly vandalize walls, my neighbors will voluntarily take action.	3.213 (0.041)	3.328 (0.058)	3.095 (0.057)	0.234[a]
	If a fight takes place in the neighborhood, my neighbors will voluntarily take action.	3.178 (0.040)	3.330 (0.057)	3.023 (0.056)	0.307[a]
	If a public order situation occurs, my neighbors will take action.	3.235 (0.038)	3.364 (0.055)	3.102 (0.053)	0.262[a]
	Average	3.128	3.244	3.009	—
Citizen participation	I am part of at least one neighborhood residential organization (e.g., condo board, residential community center).	2.752 (0.045)	2.904 (0.063)	2.597 (0.063)	0.307[a]
	I contribute to the organization/s noted previously.	2.226 (0.045)	2.311 (0.067)	2.138 (0.061)	0.172[c]
	I have had certain responsibilities in the organization/s noted previously.	2.017 (0.044)	2.044 (0.065)	1.989 (0.060)	0.056
	I meet my responsibilities to the organization/s noted previously.	2.163 (0.046)	2.193 (0.065)	2.133 (0.066)	0.060
	Average	2.290	2.363	2.214	—

Note: N may differ by variables because of missing values.
[a]$p < 0.01$.
[b]$p < 0.05$.
[c]$p < 0.1$.

groups. In contrast, there was statistical difference in the mean values of only one out of four indicators for citizen participation.

Table 3 shows that almost half of the respondents lived in CBP areas. Basic socioeconomic characteristics of the participants were included in the analysis to account for the influence of individual attributes on social capital. Approximately 40% of the participants were male. The sample areas were quite aged neighborhoods in that almost half of residents were over 50 years old. Over 64% of respondents owned their homes. Over 60% of respondents have lived in their neighborhoods for 1 to 10 years, and 33% have stayed in their neighborhoods for longer than 10 years. The education level of the respondents was lower (46% had a college degree or higher) than the overall education level in Seoul (56% of the population has a college degree or higher) as of 2015 (Seoul Statistics 2015). The respondents' median monthly income was approximately $1,000 lower than the average in Seoul (the average median income of residents in Seoul is $44,750). Comparing the experimental and control groups, no statistically significant difference in socioeconomic characteristics was detected. This implies that the selection of study areas for the research, comprised of 12 experimental and 12 control neighborhoods, reasonably allowed for a clear comparison, minimizing the influence of difference between the two groups.

Results

The authors conducted exploratory factor analysis (EFA) to select proper indicators, from which the four latent variables (sense of community, neighboring, collective efficacy, and citizen participation) could be extracted. As a result, a total of 12 indicators were selected (three indicators for each latent variable). The process and results of the EFA are not presented in this paper, but are available upon request. Then, the authors carried out confirmatory factor analysis (CFA) to confirm the validity of the selected indicators

Table 3. Descriptive Statistics of Key Variables by the Community Building Projects and Matched Neighborhoods, and Tests of Differences

Variables	Definitions	Total		Experimental group		Control group		Mean difference
		N	Mean	*N*	Mean	*N*	Mean	
Question predictor (treatment)								
CBP	Community building projects (0, not executed; 1, executed)	536	0.507	—	—		—	—
Socioeconomic characteristics								
Male	Gender (0, female; 1, male)	499	0.403	253	0.379	246	0.427	−0.047
Elderly	Resident's age (0, 18–50 years old; 1, over 50 years)	495	0.495	250	0.504	245	0.486	0.018
Homeowner	Ownership of housing (0, rent or lease; 1, ownership)	486	0.644	247	0.680	239	0.607	0.073
Long-term resident	The length of residence is more than 10 years (0, otherwise; 1, more than 10 years)	490	0.331	249	0.357	241	0.303	0.055
Midterm resident (base)	The length of residence is from 1 to 10 years (0, otherwise; 1, 1–10 years)	490	0.616	249	0.598	241	0.635	−0.036
Short-term resident	The length of residence is less than a year (0, otherwise; 1, less than a year)	490	0.053	249	0.044	241	0.062	−0.018
College education	Education level (0, otherwise; 1, college or higher)	485	0.460	246	0.451	239	0.469	−0.017
High income	High monthly household income (more than $5,000) (0, otherwise; 1, high income)	462	0.082	234	0.073	228	0.092	−0.019
Middle income (base)	Middle monthly household income ($2,000–5,000) (0, otherwise; 1, midincome)	462	0.485	234	0.496	228	0.474	0.022
Low income	Low monthly household income (less than $2,000) (0, otherwise; 1, low income)	462	0.433	234	0.432	228	0.434	−0.003

Note: $p < 0.05$, including significance levels of difference of means/proportions; — indicates not applicable.

and decided the latent variable structure that would depict the four dimensions of social capital. Confirmatory factor analysis was used to statistically test this latent structure to determine which indicators were most highly correlated with the four latent variables (Model 1 in Table 4). The CFA results showed that the indicators were successful in extracting the four dimensions of social capital because the indicators' coefficients were significant and relatively large (greater than 0.67). The values of the fit indices, such as the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and standardized root mean square residual (SRMR), evaluated model fit. General guidelines for the fit indices were that RMSEA and SRMR less than 0.05, and CFI and TLI values greater than 0.95, indicated good model fit (Hu and Bentler 1999). All of the fit indices satisfied these guidelines, indicating good model fit.

The authors investigated the impact of living in CBP areas on social capital using SEM that employed CFA as a measurement model (Model 2 in Table 4). Although this model did not control for socioeconomic characteristics, the results showed that people living in neighborhoods with CBPs tended to have a higher sense of community and collective efficacy than those in neighborhoods without CBPs. However, there was no statistical difference in neighboring and citizen participation levels between the two groups.

Table 4. Confirmatory Factor Analysis and Structural Equation Modeling Estimating Social Capital of Residents

Variables	Model 1: CFA on each dimension ($n = 521$)			Model 2: SEM with CBP ($n = 521$)			Model 3: SEM with covariates ($n = 476$)		
	Coefficient	(Robust S.E.)	*p*-value	Coefficient	(Robust S.E.)	*p*-value	Coefficient	(Robust S.E.)	*p*-value
Measurement model									
Sense of community									
I_1: Many people that I count on live in the neighborhood.	1.000	—	—	1.000	—	—	1.000	—	—
I_2: My neighbors will help me out when I need it.	0.833[a]	(0.051)	0.000	0.836[a]	(0.053)	0.000	0.844[a]	(0.052)	0.000
I_3: I trust most people living in my neighborhood.	0.673[a]	(0.062)	0.000	0.681[a]	(0.064)	0.000	0.668[a]	(0.064)	0.000
Neighboring									
I_4: I often discuss important private matters (e.g., education, divorce) with my neighbors.	1.000	—	—	1.000	—	—	1.000	—	—
I_5: I often invite my neighbors to eat with me or otherwise spend time with me.	0.987[a]	(0.063)	0.000	0.987[a]	(0.063)	0.000	0.985[a]	(0.067)	0.000
I_6: I often meet my neighbors outside of the neighborhood (e.g., watching movies, sports games, eating together).	0.880[a]	(0.064)	0.000	0.880[a]	(0.063)	0.000	0.887[a]	(0.064)	0.000

Table 4. (*Continued*.)

Variables	Model 1: CFA on each dimension ($n = 521$)			Model 2: SEM with CBP ($n = 521$)			Model 3: SEM with covariates ($n = 476$)		
	Coefficient	(Robust S.E.)	p-value	Coefficient	(Robust S.E.)	p-value	Coefficient	(Robust S.E.)	p-value
Collective efficacy									
I_7: If a fight takes place in the neighborhood, my neighbors will voluntarily take action.	1.000	—	—	1.000	—	—	1.000	—	—
I_8: If children or adolescents do not go to school and wander around the street, my neighbors will take action to help them.	0.792[a]	(0.069)	0.000	0.805[a]	(0.069)	0.000	0.814[a]	(0.068)	0.000
I_9: If children or adolescents carelessly vandalize walls, my neighbors will voluntarily take action.	0.795[a]	(0.072)	0.000	0.805[a]	(0.071)	0.000	0.787[a]	(0.075)	0.000
Citizen participation									
I_{10}: I contribute to the organization/s noted previously.	1.000	—	—	1.000	—	—	1.000	—	—
I_{11}: I have had certain responsibilities in the organization/s noted previously.	0.877[a]	(0.072)	0.000	0.878[a]	(0.071)	0.000	0.900[a]	(0.066)	0.000
I_{12}: I meet my responsibilities to the organization/s noted previously.	0.864[a]	(0.091)	0.000	0.865[a]	(0.090)	0.000	0.883[a]	(0.080)	0.000
Structural model									
Sense of community									
CBP	—	—	—	0.240[b]	(0.119)	0.044	0.205[c]	(0.111)	0.065
Male	—	—	—	—	—	—	0.074	(0.094)	0.431
Elderly	—	—	—	—	—	—	0.101	(0.079)	0.204
Long-term resident	—	—	—	—	—	—	0.259[a]	(0.091)	0.004
Short-term resident	—	—	—	—	—	—	−0.188	(0.187)	0.315
Neighboring									
CBP	—	—	—	0.188	(0.139)	0.174	0.145	(0.131)	0.266
Male	—	—	—	—	—	—	0.107	(0.087)	0.220
Elderly	—	—	—	—	—	—	0.132	(0.099)	0.184
Long-term resident	—	—	—	—	—	—	0.398[a]	(0.105)	0.000
Short-term resident	—	—	—	—	—	—	−0.473[a]	(0.154)	0.002
Collective efficacy									
CBP	—	—	—	0.221[b]	(0.101)	0.028	0.214[b]	(0.103)	0.039
Male	—	—	—	—	—	—	0.184[c]	(0.095)	0.053
Elderly	—	—	—	—	—	—	0.010	(0.088)	0.907
Long-term resident	—	—	—	—	—	—	0.165	(0.111)	0.135
Short-term resident	—	—	—	—	—	—	−0.112	(0.126)	0.370
Citizen participation									
CBP	—	—	—	0.131	(0.161)	0.416	0.128	(0.141)	0.365
Male	—	—	—	—	—	—	0.190[b]	(0.091)	0.038
Elderly	—	—	—	—	—	—	0.292[b]	(0.128)	0.022
Long-term resident	—	—	—	—	—	—	0.384[a]	(0.129)	0.003
Short-term resident	—	—	—	—	—	—	−0.304[c]	(0.164)	0.063
RMSEA	0.049			0.049			0.039		
CFI	0.980			0.977			0.977		
TLI	0.969			0.964			0.965		
SRMR	0.031			0.032			0.029		

[a] $p < 0$.
[b] $p < 0.05$.
[c] $p < 0.10$.

Model 3 in Table 4 presents the results of the SEM that controlled for socioeconomic characteristics. The Appendix and Fig. 4 illustrate the relationships among the variables in this SEM (Model 3). The authors excluded home ownership and education level variables, which were insignificant in the model, to save degrees of freedom and retain statistical power. The household income variables also were excluded from the model because of the large number of missing values and insignificant coefficients.

Model 3's results partially confirmed the hypothesis that CBPs executed by local governments affect the social capital of residents in that area. The results indicated that implemented CBPs are correlated with two dimensions of social capital: sense of community (at the 0.10 alpha level) and collective efficacy (at the 0.05 alpha level). These were categorized as cognition/trust dimensions. However, there was no statistical evidence that CBPs were associated with changes in the other two dimensions of social

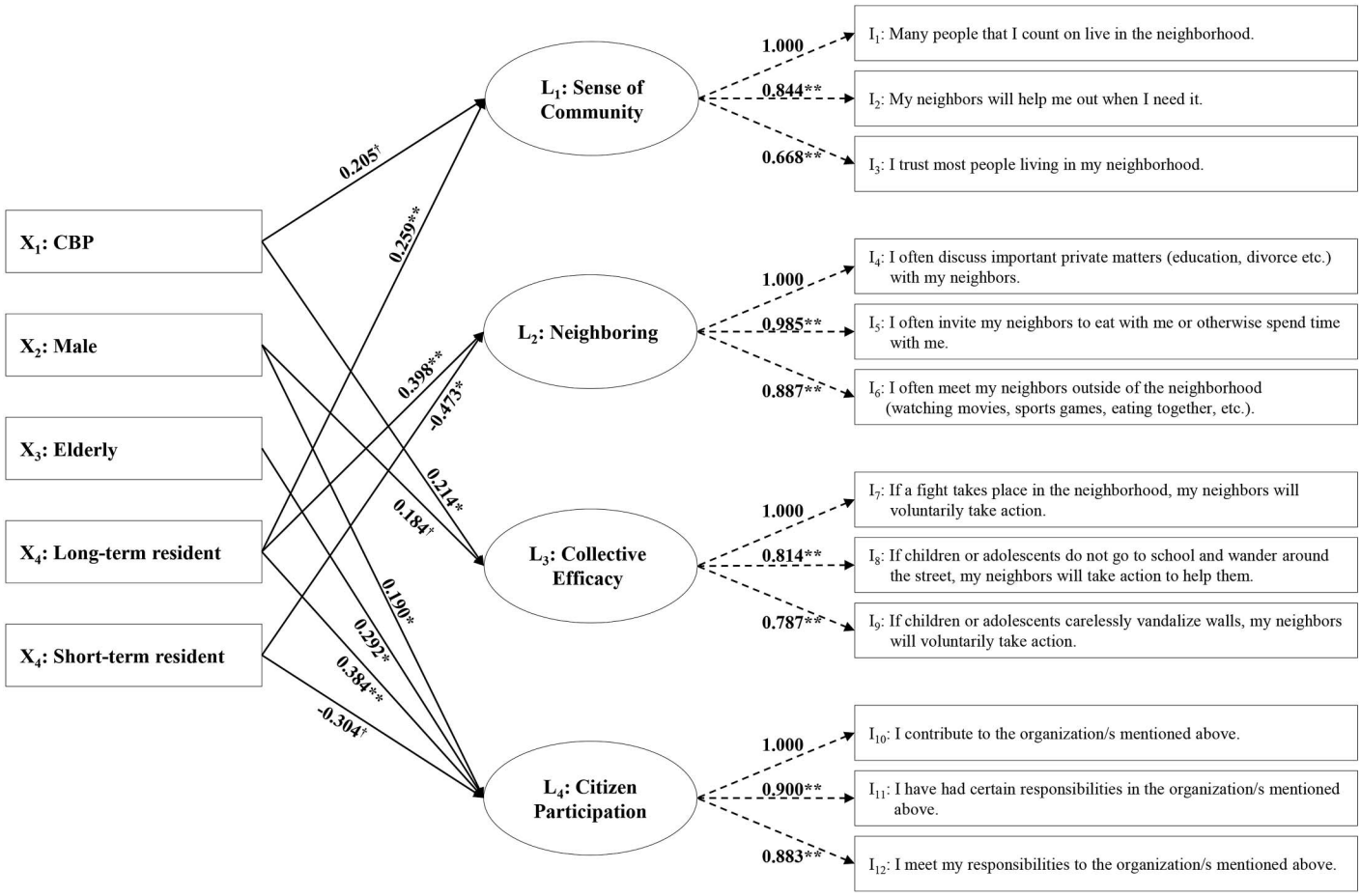

Fig. 4. Structural equation modeling (SEM) estimating social capital of residents

capital: neighboring and citizen participation, which were regarded as social behavior dimensions. Among the tested socioeconomic factors, male residents tended to have higher collective efficacy and citizen participation levels than female residents. Regarding age, residents who were over 50 had higher citizen participation levels than other age groups. The results also indicated that length of residence was positively correlated with three dimensions of social capital: sense of community, neighboring, and citizen participation. Residents who lived more than 10 years in a neighborhood tended to have a higher sense of community, neighboring, and citizen participation levels, and residents who lived in a neighborhood for less than a year showed lower neighboring and citizen participation levels.

Implications and Conclusions

The authors investigated the impact of participatory neighborhood revitalization on residents' social capital by analyzing household survey data from residents living in neighborhoods with CBPs and matched neighborhoods in Seoul, Korea. Thus, the results should be interpreted with demographical characteristics in the selected study areas: 43.29% survey respondents had a low median income (less than $2,000 per month), and survey respondents had lower median monthly incomes than Seoul's average. This reflects that dilapidated and old neighborhoods were selected for revitalization. Although these projects have been implemented under different titles, including pilot-livable community planning in 2009, the Human Town project in 2010, and a residential environmental management project in 2012, these projects share a focus on participatory community planning, which encourages residents' participation and relies on their opinions during project execution, and aims to improve social capital of the residents.

Increasing social capital could lead to benefits for the public good. Previous research suggested that social, human, and cultural capital can convert into financial and physical capital, which means that growing social capital is crucial in revitalizing disinvested neighborhoods (Light 2004; Vidal 2004). Additionally, Woolcock and Narayan (2000) demonstrated that social relations provide opportunities for mobilizing other growth-enhancing resources. In this vein, increasing residents' social capital might represent successful neighborhood revitalization.

This study's EFA and CFA results were consistent with Perkins and Long's (2002) categorization of social capital into four dimensions: (1) sense of community, (2) neighboring, (3) collective efficacy, and (4) citizen participation. On the basis of the latent structure of social capital, the SEM showed that Seoul City's CBPs played a role in building social capital among residents—particularly a sense of community and collective efficacy. This result indicated that residents in neighborhoods with CBPs likely had higher social capital's cognition/trust dimensions in their neighbors. Although the analysis did not differentiate the residents who directly participated in the planning process from other residents during the sampling process, both groups were included in the sample. Thus, the observed differences between the CBPs and matched communities implied that the direct participants may have interacted with other

residents in their communities, leading to the increased overall social capital levels of CBPs. However, implementing a CBP did not have a significant influence on residents' social behavior, represented by neighboring and citizen participation. This result indicated that participatory planning, although having contributed to the increased social capital cognition/trust dimensions, was not effective enough to bring about a change in behavior.

In addition to finding modest impacts of CBP on sense of community and collective efficacy, the authors also found that social capital dimensions were individually associated with different socioeconomic factors. For instance, older residents were more likely to participate in community organizations than younger residents; the longer residents lived in their community, the more socially active they were and the higher their sense of community. The study also showed that male residents had higher collective efficacy and citizen participation than female residents. These results are consistent with those discussed in previous studies (Hyman and Wright 1971; Prezza et al. 2001; Rankin and Quane 2000).

Current CBPs have been implemented primarily by central government-sponsored policies rather than voluntary participation of residents and civic groups. For instance, most projects have been initiated according to the interests of government agencies (e.g., welfare, economy, culture), and then foster participation from citizens. Seemingly, citizens can draw project plans by themselves as long as their proposed projects are consistent with the interests of government departments and are relevant to their purposes. Moreover, leaders of resident and civic organization are sometimes associated more with policymakers or government officials than with the residents themselves. Thus, CBPs led by the central government could be ineffective in enhancing communities. In fact, the findings showed that living in a neighborhood with a CBP was not significantly associated with residents' social behavior, which implies that the influence of the participatory process plays a limited role in encouraging residents to participate in community activities. However, CBPs' effects may be even more far-reaching because the four dimensions of social capital are intricately correlated. Sense of community tended to have a particularly positive correlation with neighboring and citizen participation (Long and Perkins 2007). Thus, although there was no evident direct impact of CBPs on the social behavior dimensions of social capital (neighboring and citizen participation), increased cognition and trust dimensions (sense of community and collective efficacy) potentially may lead to improved overall social capital in the future.

However, it is still clear that the effect of CBPs' participatory process was not fully successful because these projects failed to encourage residents' social behavior in a short term. Developing social capital in an economically depressed neighborhood was one of the challenges of developing local assets (Vidal 2004). The typical process of forming social capital is through the voluntary participation of a society's members; relationships between members are horizontal and rely on official contact, such as of a group, organization, or conferences, and trust, reciprocity, consideration, and mutual respect are necessary virtues in this democratic system (Putnam 1993). However, in many Asian countries with short histories of democracy, such as South Korea, western scholars' theories in respect to promoting social capital are rarely accepted (Patel et al. 2016). In the case of South Korea, regionalism, school relations, and kinship play significant roles in citizen participation (Park 2005). Also, a social organization depends on an individual, unofficial, and vertical relationship between members (Park 2005). Thus, to improve social capital through participatory processes, a more sophisticated understanding of local social structures is essential. How, then, can urban planners implement desired participatory community planning in Korea in which residents are willing to participate? This research called for more work on understanding participatory community planning and social capital in countries with difference social contexts.

Shortcomings and Future Research

The results were relevant only to a specific demography, geography, and time of year (i.e., April–May 2015) and may not be generalized. For example, comparing the survey data to Seoul's census data, it appeared that residents in the sample had much lower household incomes than average Seoul residents. Also, the present study selected 24 communities within 12 districts located in parts of Seoul with different attributes. This factor may lead to inconsistent outcomes for CBPs. For example, socioeconomic characteristics, accessibility to adjacent neighborhoods and social amenities, and existing social capital in each community may vary. These could affect testing of the impact of CBPs on social capital.

Additionally, the present study did not differentiate between the impact of CBPs' participatory processes and physical interventions on social capital. Although participation was a pivotal factor of CBPs, every CBP also involved physical improvement projects, such as building a community center or park, installing CCTVs, and creating murals. Thus, isolating the influence of participatory processes from the impact of physical changes should improve the validity of the analysis.

Another limitation of the present study was rooted in the cross-sectional nature of the analysis, which only stated that the longer people lived in the neighborhood, the higher the level of their social capital—an analysis that is unable to reveal how long the social effects of resident participation last. Longitudinal analysis in the future may shed light on the duration of the social effects through participatory planning.

Last, the present study did not fully interpret all of social capital's dimensions. This was because the authors limited the dimensions of social capital to a psychological approach and, thus, only incorporated Perkins and Long's (2002) four dimensions. Thus, the authors excluded other factors that may impact social capital, such as communitarianism, community satisfaction, block confidence, and place attachment. Parallel studies in different contexts may enhance the generalizability of this study. Also, future studies that investigate more comprehensive social capital dimensions should shed light on the social influence of neighborhood revitalization through resident participation.

Appendix. Equations of Structural Equation Models Estimating Relationships among CBPs, Social Capital Indicators, and the Socioeconomic Factors of Residents

Structural Equation Model

Structural Model

$$L = X\alpha + \mu, \quad \mu \sim N(0, \varphi_{\mu}\text{diagonal}) \tag{1}$$

Measurement Model

$$I_i = L_1\beta + \xi, \quad \xi \sim N(0, \psi_{\xi}\text{diagonal}) \tag{2}$$

where L_1 = sense of community, $i = 1, 2, 3$

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$$I_i = L_2\gamma + \kappa, \quad \kappa \sim N(0, \psi_\kappa \text{diagonal}) \tag{3}$$

where L_2 = neighboring, $i = 4, 5, 6$

$$I_i = L_3\theta + \delta, \quad \delta \sim N(0, \psi_\delta \text{diagonal}) \tag{4}$$

where L_3 = collective efficacy, $i = 7, 8, 9$

$$I_i = L_4\rho + \varsigma, \quad \varsigma \sim N(0, \psi_\varsigma \text{diagonal}) \tag{5}$$

where L_4 = citizen participation, $i = 10, 11, 12$; L = latent variables; X = explanatory variables; α, β, γ, θ, ρ = unknown parameters; I = indicators of L; φ, ψ = covariances of random disturbance term; and μ, ξ, κ, δ, ζ = random disturbance term.

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