

THE COMMUNITY NETWORKS CENTER AND SOCIAL SUPPORT IN MULTIFAMILY LOW-INCOME COMMUNITIES: A CASE STUDY IN KOREA

Suk-Kyung Kim and Jaechoon Lee

Abstract

As contemporary society has moved into the digital age, community centers on housing estates throughout the world have begun to evolve to computer-based learning centers. This facility is now becoming prevalent globally, and accordingly there are neighborhood networks centers in the U.S. Similar community networks centers have been designed in subsidized multifamily housing communities in Korea since 2001, based on the recommendation of the Korean government to expand Internet access to the entire population. This study focused on residents' evaluations of the effects of a newly designed space—a community networks center in a low-income multifamily housing community. The research explored the role and benefits of the community networks center in terms of social support. The subject community was located in Suwon, Korea. Self-administered questionnaires and interviews were conducted, along with observation. The results showed that the existence of this center provided residents with satisfaction that they were receiving social support. The community networks center also functioned as an educational center for the residents. The findings suggested appropriate educational programs, systematic management and design considerations, and collaborations between government and non-governmental organizations for increasing support for community networks centers in low-income communities.

Introduction

Originally seen to be a gathering place for social and recreational events, in many cases community centers have evolved into educational resource bases with a focus on improving not just the quality of residents' lives, but their potential for self-improvement. As contemporary society has moved into the digital age,

Suk-Kyung Kim is Assistant Professor, Interior Design, School of Planning, Design and Construction, Michigan State University, East Lansing, MI; and Jaechoon Lee is a Ph.D. Candidate, City and Regional Planning, The Ohio State University, Columbus, OH.

community centers on housing estates throughout the world have begun to evolve to computer-based learning centers.

This study focuses on the effects of a newly designed space, namely a community networks center featuring an on-site computer learning center in a multifamily housing community. Particularly in a low-income family housing community, this space should provide residents with opportunities to use the Internet and other programs for educational benefits for their children, and therefore should be effective in improving residential satisfaction. In addition, networks centers are expected to provide residents with opportunities to meet their neighbors and to build up social support (House & Kahn, 1981). This research examined if such community networks centers would improve residential satisfaction, augment the chances of social interactions, and build up social support, including informational support for low-income families.

Review of Literature

As a traditional definition, House and Kahn (1981) stated that *social support* is defined conceptually or operationally in terms of the existence or quantity of social relationships. They also pointed out social support in terms of the structure of a person's social relationships, and the functional content of relationships. They seemed to regard the existence of social support as the most important factor. As its application in academic fields gets broader, the definition and the domain also seem to be changing. *Social network* has been considered as a type of social support with an emphasis on the structure that exists among a set of relationships. While social support has the impression of a one-way relationship, social network seems to imply interwoven relationships.

The term social network has been used more frequently in recent years in research studies (Litwin, 2001) and in daily life as a result of the increasing use of the Internet. The invisible social network created by the cyber-world is now regarded as one of the most important social relationships. Some researchers in the third world are studying the effects of this type of social network (Yim, Lee, & Kim, 2001). The space providing Internet service has thus received academic interest as a new space for creating social networks.

According to House and Kahn (1981), four types of social support could be defined: emotional, instrumental, informational, and appraisal. As one of the types of social support, informational support has been mainly considered with a view of personal interaction with other group members. It has also been known that informational support could not be separated from emotional support in its effects. Therefore, it could be inferred that when informational support is well combined with emotional support, its effects could be maximized. As sources of informational support, family-based network, friends-based network, and neighbors-based network were considered. Informational support has been mainly

studied with an emphasis on the relationships between group members, friends, family (House & Kahn, 1981), or neighbors (Litwin, 2001).

According to Skjaeveland and Garling (2002), the idea of the influence of architecture on causal social relations arose from Festinger, Schachter, and Back's (1950) classic investigations. Their analysis revealed that ease of interaction with neighbors, influenced by such variables as the placement of access of paths and stairways, was a strong determinant of friendship formation.

In previous research, social relations and neighborhood attachment have been studied regarding existing public spaces such as stairs, paths, or entrances. However, there is no previous study that explored this newly designed space and its effects on developing social support or social networks in low-income communities. It is thus clear from the review of literature that the community networks center needs to be explored in terms of whether it would function as a new community space providing social support for residents, and whether residents have any opinions and demands for this type of social space.

Community Networks Centers

As contemporary society increasingly moves to the digital age, one of the worldwide issues in low-income housing is the establishment of on-site computer networks centers in communities. Neighborhood Networks Centers, entitled by the U.S. Department of Housing and Urban Development (HUD), is the representative name for this type of computer learning center. They were also called Internet Accessible Centers or Networks Centers within multifamily housing communities. These facilities provide Internet access and educational programs for families who are unable to afford home computers. In this study, those centers established in multifamily housing communities were named as Community Networks Centers, because those centers are located in the community center buildings of multifamily housing.

Now that the Internet has evolved into such an important social resource, it has been assumed that the community networks center can improve residents' lives in other ways, such as the formation of virtual communities and the development of educational opportunities. These Web-based environments are expected to provide opportunities to increase the frequency of casual meetings with their neighbors, and to share their thoughts and concerns with neighbors. HUD established Neighborhood Networks Centers for low-income multifamily housing in 1995, and has supported these facilities in more than 700 communities (U.S. Department of Housing and Urban Development, 2007). Though several other countries including England and South Korea have also applied these facilities for their low-income families, their history is shorter than HUD's program.

In England the Peabody Trust (2007) initiated Neighborhood Learning Centres in low-income housing estates in London. The Trust has funded the

Digital Learning Ring, five housing estate-based multi-media centers intended to bring virtual learning to inner-city housing estates. These resources provide access to online courses in literacy, numeracy, and vocational training. The Trust has also developed the "Computer Gym," a mobile Internet-access facility that visits housing estates lacking digital learning centers. This program was cited as an example of best practice in the U.K. by the Social Exclusion Unit's National Strategy for Neighborhood Renewal. Web sites established through Trust assistance help estate residents locate better housing for them and view housing inspectors' reports. They help residents form tenant group Web sites and the Trust provides special sites for teens and old age pensioners.

In the Korean context, since the beginning of 1998, the Korean government has recommended community networks centers for the residents in low-income multifamily housing communities. This recommendation has been linked with the governmental vision of "Cyber Korea 21." In particular, the Ministry of Information and Communication developed an item in April 1998 for "the Application of High-speed Internet Service in Residential Buildings" (Yim, Kim, & Lee, 2001). At this time, the Ministry of Construction and Transportation established the legal items to design or add common networks facilities to existing public subsidized apartment communities. Based on these policies, some public subsidized apartments converted abandoned spaces to the common spaces for use of the Internet. According to Korea Housing Management (2007), as of 2007 more than 40 subsidized apartment communities in Korea have renovated their "community buildings" or added new spaces for providing community networks centers.

The research context selected for this study is a public subsidized apartment community in the City of Suwon, Korea. The aim of this study is to verify the role of the community networks center as a source of social support in a public subsidized multifamily housing community in Korea. The specific objectives of this research were to: (a) determine whether a newly designed space, namely a community networks center in a low-income family community, improves residential satisfaction, (b) examine whether this space plays an important role as a source of social support, and (c) suggest program and policy considerations for future application.

Methods

This study employed physical observations, a questionnaire survey of residents to discover the functions and contribution of the community networks center and their opinions on these issues, and interviews with the apartment property manager and program coordinator of the center. At first, physical characteristics of the community networks center were observed. The architectural surroundings of the center and the community building were investigated. The facilities of the subject

apartment community were investigated with a checklist and pictures were taken. As the primary method to collect data, a questionnaire survey of the residents was conducted. One hundred and twenty residents were randomly selected from the apartment community. The number of respondents was 106 (88% response rate). Data collection began in July 2002 and was completed in January 2003. As the final step, interviews were conducted. One interviewee was the head manager of the management office, and the other interviewee was the program coordinator for the community networks center in charge of Internet-related educational programs for the residents.

This community networks center was the first in Korea to be added to an existing low-income multifamily housing community. The subject site of this study is located in Suwon, Korea. It is an apartment community for low-income families that was completed in 1992. The community networks center was added as a new facility in September 2000. All residents of this apartment community are receiving financial assistance from the local government. They could be categorized into low- or very-low income families in Korea.

Data Collection and Analysis

After having added the networks center to the "Community Building" of this apartment community, the computer-related equipment and high-speed Internet service were donated by two network companies. Since computers and the electronic equipment are vital to this networks center, electronic equipment such as computers and Internet services were investigated. Architectural features of the center such as location, size, lighting, and interior colors were also investigated. The site was visited three times to document the architectural conditions. A checklist was completed and pictures were taken by the researchers.

Questionnaire surveys were conducted to investigate residents' opinions and to discover better solutions for applying community networks centers in other low-income communities in the future. The contents of the questionnaire were categorized into three parts. The first part mainly consisted of demographic characteristics of the participants, including respondents' age as well as number and ages of their children. The second part focused on the current status and use of the space. Frequencies of using the center were determined. The third part consisted of residential satisfaction-related questions and suggestions to verify the role of the center for improving social support and relationships.

Survey results were analyzed by several statistical techniques. The general information of survey participants and their opinions on the networks center were analyzed through descriptive statistics such as frequencies and percentages. Respondents' opinions regarding residential satisfaction and suggestions for the center were additionally verified based on correlations between overall satisfaction and the other variables. Residents' opinions were compared according to their

demographic characteristics such as their age and the number and ages of their children. Because this study had one subject community, mean differences in participants' opinions were verified by non-parametric statistics, for instance the Kruskal-Wallis one-way analysis of variance. All statistical analysis was done by SPSS+ version 15.

Interviews with the apartment head manager and the program coordinator were separately conducted. Each interview took two hours. The questions were categorized into three sections: actual conditions of the residents' use, management-related questions, and suggestions for future applications of community networks centers in other low-income multifamily housing communities. The qualitative data produced by the interviews were content analyzed.

Results

Physical Observations

The number of households in the selected apartment community was 1,213. The net area of the apartment lot is 30,655m². The sizes of individual apartment units were 39.05m², 39.87m², 39.85m², or 43.92m². Four apartment buildings composed this community. One of them was a 12-story apartment building and the other three were 15-story buildings. The type of heating system was a central heating system, and the architectural structure was a reinforced concrete structure. Community facilities included a basketball court, a volleyball court, a badminton court, three tot lots, an outdoor lounge, and a community building. The community networks center was placed in the community building located in the entrance of the apartment community.

In the community networks center, there were 15 computers, 16 chairs, one blackboard, two heating panels, five cooling fans, and one air-conditioner. The size of the center was approximately 4 × 6 m². The space was painted with a bright grey color. Colors of the furniture and a window shade were cold colors. When the researchers visited the space, a computer lesson was being carried out. Eleven students were attending the class, most of them women aged 40 and older.

Surveys

The total number of participants was 106. The participants were all house wives, assuming that house wives could best answer questions about their families. As shown in Table 1, the average age of respondents was 43.0 years. The mean number of children in each family was 1.7. Approximately 40% of the participants had their first child at middle or high school age.

Table 1. General Characteristics of Survey Participants

Category		Frequency	Percent
Age	20s	8	7.5
	30s	32	30.2
	40s	43	40.6
	50s and older	23	21.7
	Total	106	100.0
	Mean = 43		
Number of children	0	3	2.8
	1	39	36.8
	2	52	49.1
	3 and more	12	11.3
	Total	106	100.0
	Mean = 1.7		
Age of eldest child	Preschooler	11	10.4
	Elementary	15	14.2
	Middle school	13	12.3
	High school	29	27.4
	College student	10	9.4
	Older than college student	21	19.8
	No response	7	6.6
	Total	106	100.0

All the participants had an opportunity to visit the community networks center, and received an introduction to the space and equipment from the management office (Table 2). When asked how often they used the center, 17.9% of the participants responded that they used the center at once a month. Approximately 18% visited the space and used computers at least once a week, and 8.5% used the space once a day. About 54% of respondents, however, did not use the space since their first visit. These results show that most of the participants did not frequently use this center. Frequency of eldest child's center use was similar to the participants, with 52.8% never visiting. Comparing percentages on the frequency of center usage, the most active user was the participants' eldest child (47.2%) followed by the house wives studied (41.5%).

Table 2. Use of the Community Networks Center

Category		Frequency	Percent
Frequency of respondents' center use	Just once and never visited	58	54.7
	Once a month	19	17.9
	Once a week	19	17.9
	Once a day	9	8.5
	No response	1	0.9
	Total	106	100.0
Frequency of eldest child's center use	Just once and never visited	56	52.8
	Once a month	16	15.1
	Once a week	21	19.8
	Once a day	2	1.9
	No response	11	10.4
	Total	106	100.0
Most frequent user of center	First child	50	47.2
	Second child	8	7.5
	Myself	44	41.5
	Others	4	3.8
	Total	106	100.0

The existence of the community networks center appeared to improve residential satisfaction with their apartment community. Twelve questions were asked to investigate residents' opinions about the center. These questions included residents' satisfaction with the current conditions of the center, benefits from the center, the role as a space for social relationships, needs for improving the center, and overall satisfaction. The list of the questions and the results are presented in Table 3. The degree of satisfaction was measured by a 5-point Likert item scale, ranging from 1 (mostly disagree) to 5 (mostly agree).

Regarding the location and size of the center, participants' satisfaction levels were a little higher than the neutral point (3). The mean value of residents' satisfaction was 3.2 for size of the center, 3.1 for location, 3.0 for the indoor environment of the center, and 2.9 for the convenience of the center (Table 3).

In terms of benefits, participants thought that the center would be helpful for children's education ($M = 3.2$) and keeping up with contemporary information ($M = 3.5$). Participants responded that they needed more community networks centers ($M = 3.4$) and more educational programs to help the residents use computers ($M = 3.7$). They also suggested that more support for the computer-related equipment and services was necessary ($M = 3.4$). However, the mean values regarding the

Table 3. Participants' Opinions on Satisfaction-Related Questions (N = 106)

Category	Question	Descriptive		Mean Differences from Kruskal-Wallis Tests According to Independent Variables	
		M	SD	Age of Respondent (p)	Age of First Child (p)
Satisfaction with current conditions of the center space	Location of the center is proper	3.1	0.91	.010	.001
	Size of the center is proper	3.2	0.90	.078	.206
	Indoor environment of the center is comfortable	3.0	1.05	.001	.039
	It is convenient to use computers within the community	2.9	1.09	.008	.063
Benefits from the networks center	Helpful for children's education	3.2	1.02	.058	.063
	Enhancing the residents to use Internet for keeping up with current information	3.5	0.91	.001	.163
Role as a space for social relationships	The place for exchanging information with neighbors	2.9	1.20	.000	.069
	Being used actively as a meeting space with neighbors as well as an Internet using space	2.5	1.21	.000	.007
Needs for making the center better	Need more community networks centers in the apartment community	3.4	0.96	.013	.194
	Need more educational programs for the residents	3.7	0.73	.493	.047
	Need more support for equipments and services	3.4	0.97	.021	.032
Overall satisfaction	Satisfied with the fact that our community has the community networks center	3.5	0.89	.486	.784

Note: Possible responses were 1 (mostly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (mostly agree).

role of the networks center as a space for creating social relationships were below 3.0. Instead of having social contacts in the community networks center, the community center building, apartment lobbies, and pedestrian roads were found to be the primary social spaces for participants. The mean value of residential satisfaction of the center was positive ($M = 3.5$). More than 62% of the participants agreed or strongly agreed that “I am really satisfied with the fact itself that our community has this center.”

Residents’ opinions on satisfaction-related questions were examined to determine if there were any differences depending on demographic characteristics. For several opinions there were significant differences, based on Kruskal-Wallis one-way analysis of variance, depending on participants’ age and age of their first child (Table 3). This was especially true regarding their opinions on the role of the center as a social space, with significant mean differences occurring depending on their ages. The mean value of the age group of 40s was higher than the other age groups. This mean difference seemed to be related with the age of their first child and their needs relating to the community networks center. For overall satisfaction with the center, there were no significant mean differences depending on the participants’ ages and the age of their first child.

As shown in Table 4, the overall satisfaction with the center was significantly correlated with “satisfaction with the current conditions of the center space,” “benefits from the networks center,” “the role as a space for social relationships,” and “needs for making the better center” at the $p < .01$ level. Among the variables, residents’ satisfaction with the center was strongly correlated with their opinions on the benefits from the center. If they strongly agreed with the benefits from the center, their overall satisfaction with the community networks center was higher.

Table 4. Correlations between Overall Satisfaction and Other Variables

Variable	R with Overall Satisfaction	P
Satisfaction with the current conditions of the center space	.461	.000
Benefits from the networks center	.506	.000
Role as a space for social relationships	.351	.000
Needs for making the center better	.403	.000

The above results reveal that this center was positively regarded in terms of informational support for children’s education and the residents. The center itself

provided the positive perception to the residents that they were provided with social services that update current information through the Internet. Participants expressed opinions demanding more community networks centers in a community, more educational programs that facilitate the functions of this center, and more financial support for computer equipment and services.

The function as a social space, however, was not strongly recognized by the survey participants. Nonetheless, this center could be expected to encourage residents to participate in the use of Internet, and provide them with emotional satisfaction that they are receiving informational support and are not segregated from their neighbors as well as the outside. It could thus be expected, in the long term, that the center would evolve into a space for developing social networks among the residents in a low-income family apartment community.

Questions to verify the contribution of this community networks center were then asked. The most important contribution of the center to the community was that it provided the residents with emotional satisfaction even though they did not use the space frequently (42.5%). As the second positive effect, participants pointed out the educational effects for their children (30.2%) (Table 5).

A negative point of the community networks center was that the participants indicated there was a lack of information regarding the functions and programs of this center (25.5%). They also agreed with the lack of systematic management of the center (22.6%). While many respondents agreed with the educational benefits, they were also worried that this center could make their children spend too much of their time playing computer games without parental control (22.6%). These results support the idea that the proper educational programs for the community networks center should be designed for facilitating community residents' more active participation.

For the future application of this community networks center in low-income apartment communities, four items regarded to be important for architectural planning were asked. As Table 5 shows, participants emphasized security and convenience for the use of the center (44.8%) and accessibility (23.8%).

Interviews

Two interviewees participated in this research. One was the apartment head manager and the other was the educational program coordinator. It was found that various supports from outside of the community were provided for managing the community networks center and coordinating educational programs. The computer equipment and Internet services were provided by two network companies without any charge. The educational programs were administered by the program coordinator, but there were more than 20 part-time volunteers to help the coordinator. They were undergraduate students majoring in computer science at a nearby university—educating residents without payment. According

Table 5. Issues in Planning the Community Networks Center

Category	Opinion	<i>n</i>	%
Contribution of center to the community	Providing current information through Internet use	20	18.9
	Being a social space where the residents exchange current information with their neighbors	9	8.5
	Functioning as an educational center for children	32	30.2
	Providing emotional satisfaction even though they do not use frequently	45	42.5
	Total	106	100.0
Problems of the center	Lack of systematic management of the center space	24	22.6
	Lack of information regarding the functions and benefits of the center	27	25.5
	Possibilities of children's overexposure to Internet games without parents' observations	24	22.6
	Insufficient size and equipment of the center	18	17.0
	Inconvenient location of the center	13	12.2
	Total	106	100.0
Most important issue in planning the center	Accessibility: residents should have easier access to the center	25	23.8
	Security and convenience: center should be planned in a secure and convenient location	47	44.8
	Design: center should be designed to be aesthetically pleasing and environmental sound	12	11.4
	Efficiency for the practical usage: center space should be large enough and well-equipped for more residents	21	20.0
	Total	105	100.0

to the educational program coordinator, the funds for computer education classes were supported by the local government. However, there was no funding for the volunteers' salaries. This lack of funding has made it difficult to steadily manage educational programs and instructors.

Several difficulties in managing this center were indicated in the interviews. As the most difficult problem, providing the budget to maintain this center and its programs was indicated. The second most difficult problem was to coordinate educational programs with insufficient equipment, and the third was to advertise educational programs to the residents. The insufficient size of the space was

highlighted. For future applications, the program coordinator and the apartment manager suggested the provision of well-considered and equipped spaces for actively facilitating the benefits of community networks centers.

The apartment manager and the program coordinator recommended several important elements for successful applications of community networks centers in the future. Prominent among them is that these centers can have an important meaning in terms of the formation of social networks among residents. While participating in educational programs and using the Internet, residents could form social relationships within and outside of the community as well as receiving informational support.

Another important element for community networks centers regards funding. Managing the programs and keeping the instructors should be regularly funded at sufficient levels. This is the most significant element for continuously encouraging residents to participate in educational programs, and to offer the opportunities to receive informational support. After encouraging more residents to use this center, social relationships could then be formed. Actually, the two interviewees agreed that the residents would like to form interactions in their computer lesson classes. After having finished classes, many residents have kept in touch with their other classmates. The managers thought highly of these continuing relationships.

The interviewees also agreed on the social attention and consideration for applications of the community networks centers in low-income apartment communities. They insisted on continuous governmental support in the financial and structural aspects. They additionally suggested that local governments should provide funds for managing the community networks centers, including the supply of full-time educational program coordinators. They expected the centers would be extended to a growing number of low-income apartment communities.

Conclusions and Recommendations

The primary purpose of this study was to examine the roles and effects of a community networks center in a low-income apartment community, considering the formation of social support for the residents. Based on a survey of residents and management interviews, the following conclusions and suggestions are presented.

First, as revealed by the survey results, the community networks center affected residential satisfaction. The center provided residents with satisfaction that they were keeping up with contemporary information. Overall satisfaction with this center was positive.

Second, the community networks center has not yet performed well in terms of fostering social relationships among residents. However, if educational programs are further developed and management leads residents to participate in the programs, these centers will function efficiently as a social space for

forming social networks among the residents. Since this subject center was also positively verified in assisting children's education in the apartment community, the educational role of the center for low-income families should be considered. As suggested by House and Kahn (1981), on the basis of a traditional concept of social support or social networks, the community networks in an apartment community could be regarded as neighbors-based networks or community-based networks.

Third, the design of community networks centers should be appropriate for encouraging residents to use the space. Space size, lighting, color scheme, furniture, and computer and Internet equipment should be considered for comfortable usage. In the case of this study, the space size was not enough to accommodate the needs from residents. The physical condition of current and future centers should thus be carefully reviewed by designers.

Fourth, governmental support and social attention for the applications of community networks centers should be provided. While applying these centers in low-income apartment communities, local governments should recommend that residents participate in educational programs and to obtain social support provided by various support sources. This will continuously provide informational support for residents.

As an example to encourage the diffusion of these community networks centers in low-income multifamily communities, the management plan of the Peabody Trust could be considered. As mentioned earlier, the Peabody Trust has been facilitating the networks centers in their housing estates in London to meet their residents' demands for informational support. They obtained ample support from the government as well as nonprofit organizations. Likewise, in general, community networks centers for low-income families should be planned by the collaborations between government and non-governmental organizations, such as network service companies and computer manufacturing companies.

This research started from the supposition that application of a small space, with available accessibility to the Internet and computer-related equipment, would provide the opportunities of social support for the neighbors in a low-income apartment community. Based on the findings of this study, it could be concluded that an important outcome of the community networks center to augment social support for low-income families has already been initiated. The next step is to facilitate the community networks center to function as a space for increasing social contacts among residents by encouraging them to participate in educational programs, and enhancing social networks with their neighbors while they are involved in the programs. This procedure would be the foundation that enhances social support, especially community-based informational support, for low-income residents of multifamily communities.

References

- Aragonees, I., Francescato, G., & Garling, T. (2002). *Residential environments: Choice, satisfaction, and behavior*. South Hadley, MA: Bergin and Garvey Publishers.
- Cohen, S., & Syme, S. (1985). *Social support and health*. Orlando, FL: Academic Press.
- Everard, K., Lach, H., Fisher, E., & Baum, M. (2000). Relationship of activity and social support to the functional health of older adults. *Journal of Gerontology: Social Sciences*, 55B(4), S208-S212.
- Festinger, L., Schachter, S., & Back, K. (1950). *Social pressures in informal groups: A study of human factors in housing*. New York: Harper.
- Fischer, C. (1982). *To dwell among friends: Personal networks in town and city*. Chicago: University of Chicago Press.
- Fleming, R., Baum, A., & Singer, J. (1985). Social support and the physical environment. In S. Cohen & S. Syme (Eds.), *Social support and health* (pp. 327-347). New York: Academic Press.
- House, J., & Kahn, R. (1981). Measures and concepts of social support. In S. Cohen & S. Syme (Eds.), *Social support and health* (pp. 83-108). New York: Academic Press.
- Korea Housing Management. (2007). *IT plaza in Korea National Housing Corporation apartments*. Retrieved May 25, 2007, from www.kohom.co.kr/index.jsp
- Kweon, B., Sullivan, W., & Wiley, A. (1998). Green common spaces and the social integration of inner-city older adults. *Environment and Behavior*, 30(6), 832-858.
- Litwin, H. (2001). Social network type and morale in old age. *The Gerontologist*, 41(4), 516-524.
- Minkler, M. (1985). Social support and health of the elderly. In S. Cohen & S. M. Syme (Eds.), *Social support and health* (pp.199-218). New York: Academic Press.
- Peabody Trust. (2007). *Neighborhood learning centres*. Retrieved May 25, 2007, from www.peabody.org.uk/pages/GetPage.aspx?id=119
- Skjaeveland, O., & Garling, T. (2002). Spatial-physical neighborhood attributes affecting social interactions among neighbors. In I. Aragonés, G. Francescato, & T. Gärling (Eds.), *Residential environments: Choice, satisfaction, and behavior* (pp.183-203). Westport, CT: Bergin & Garvey.

- Sugihara, S., & Evans, G. (2000). Place attachment and social support at continuing care retirement communities. *Environment and Behavior*, 32(3), 400-409.
- U.S. Department of Housing and Urban Development. (2007). *What is neighborhood networks?* Retrieved August 25, 2007, from www.hud.gov/offices/hsg/mfh/nnw/aboutnn/nnwwhatisnn.cfm
- Yancey, W. (1972). Architecture, interaction, and social control: The case of a large scale housing project. In J. Wohlwill & D. Carson (Eds.), *Environment and the social sciences: Perspectives and applications* (pp.126-136). Washington, DC: American Psychological Association.
- Yim, M., Kim, S., & Lee, Y. (2001). *Development on the model of intelligent apartment housing corresponding to residents' demands*. Seoul, Korea: Housing Research Institute of Korea National Housing Corporation.