Effect of Housing Type on Subjective Well-Being: Focus on New Town Developments in South Korea

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Abstract: As urbanization has matured in many areas, interest in qualitative values such as residents' residential satisfaction, social capital, and subjective well-being (SWB) has increased. However, few studies have investigated the influence of different urban environments, including housing types, on residential satisfaction, social capital, and SWB. The present study compares residential satisfaction, social capital, and SWB levels of two different housing types: high-rise apartments and low-rise dwellings. To this end, the authors analyze the large-scale survey data collected from 20,000 residents in Gyeonggi-do, Republic of Korea, using structural equation modeling. The analysis found that the satisfaction level of apartment residents tends to be higher, but their social capital level tends to be lower than their counterparts in low-rise dwellings. Because residential satisfaction and social capital dimensions are positively associated with the dimensions of SWB, the model identified apartments' positive indirect effects via residential satisfaction and negative indirect effects via social capital on subjective well-being. The results imply countervailing effects of apartment developments on residents' SWB: although offering more satisfactory residential environments, high-rise apartments may discourage social capital formation. These results call for urban planning and policy approaches that encourage social ties and interactions, thereby eventually improving residents' SWB. **DOI: 10.1061/(ASCE)UP.1943-5444.0000838**.

Author keywords: Subjective well-being; Residential satisfaction; Social capital; Housing type.

Introduction

Over the last few decades, many cities have experienced rapid urbanization centered on physical development and expansion. However, as urbanization has matured in many areas, research interest in qualitative values such as residents' residential satisfaction, social capital, and subjective well-being (SWB) has increased. The major focus of previous research has been on the association between the physical association between the physical characteristics of neighborhoods (Abass and Tucker 2018) or housing (Bramley and Power 2009) and SWB, and the second focus has been on the association between social capital such as residents' interactions, trust, and other factors and SWB (Hoogerbrugge and Burger 2018; Liu et al. 2017). However, while an integrated association between physical environment, residential satisfaction, social capital, and SWB is more important than separate associations (Beard et al. 2009; Hoogerbrugge and Burger 2018), few studies have comprehensively investigated the complex relationship among them.

In the Republic of Korea, new cities have been developed in Gyeonggi-do, which is the most populated province in the area surrounding Seoul, dispersing the population growth caused by the rapid urbanization of the capital. The major housing type in these new towns is multifamily apartments, which have created residential environments different from old low-rise residential areas in Gyeonggi-do (Fig. 1). Modern multifamily apartments are the most popular housing type in Korea. Although there are expectations of a potential price increase as the province population grows, apartments are more popular than low-rise residential areas because of easier apartment unit management and amenities such as parks, convenience facilities, and management offices within the apartment complexes. However, few studies have investigated the influence of different urban environments, including housing types such as apartments and low-rise dwellings, on residents' residential satisfaction, social capital, and SWB.

In terms of social environments, there is a perception that social capital, such as trust in neighbors, among apartment residents is low due to their structure, which may be inimical to social contact with neighbors (Seo and Ha 2009). However, in apartments, formal social contact led by a management organization can occur (Gelézeau 2007), and a community of friends and parents connected to the school district may be formed. In Gyeonggi-do, the social capital of old residential areas has decreased (Hwang et al. 2017). Korean local governments have implemented urban regeneration projects for low-rise, deteriorated neighborhoods, aiming at an improvement in both physical environments and social capital for residential satisfaction (Ryu et al. 2018). However, little empirical research has investigated how residential environments are related to residential satisfaction and social capital, thereby influencing residents' overall SWB.

The objective of the present study is to unveil the complex relationship between housing type and residents' residential satisfaction, social capital, and SWB. To this end, the authors analyzed

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(a) (b)

Fig. 1. (a) New town development in Gyeonggi-do; and (b) old residential area. (Images by Jae Seung Lee.)

large-scale survey data collected from 20,000 residents by the Gyeonggi Research Institute (Hwang et al. 2017). Such a large survey dataset is a rare opportunity to reliably investigate residential environments and quality of life. A structural equation model (SEM) approach was used to test the complex relationship among housing type and latent constructs.

Currently, Gyeonggi-do is using two methods in parallel: new city development with high-rise apartments and low-rise residential regeneration to deal with the continuous population growth and deterioration of old urban areas. The results of this study are expected to derive implications for urban development and management approaches for improving residents' SWB. Therefore, the broader goal of this study is to shed light on desirable urban development and regeneration approaches that can be applied to cities in mature urbanization stages like the cities in Gyeonggi-do.

The rest of this study is organized as follows: the next section reviews theories and empirical studies related to physical environments and latent attributes. The third section introduces the site, data, and analytic approach of the present study. The fourth section summarizes the results of the analysis, and the final section discusses the implications of the findings.

Theoretical and Empirical Background

Subjective Well-Being

Subjective well-being (SWB), defined as "a person's cognitive and affective evaluations of his or her life," is one of the core concepts of social science and often understood as the goal of public policies and social interventions (Diener et al. 2002). Researchers have discussed the multidimensional features of SWB, which describe how people experience quality of life, including emotional reactions and cognitive judgments. Diener (1984) suggested three components of SWB: frequent positive affect, infrequent negative affect, and cognitive judgments of life satisfaction. Later, domain satisfaction, such as health and leisure, was additionally suggested as an SWB component (Diener et al. 1999). Empirical studies have identified a close correlation between positive emotion (Cho et al. 2020; Franke et al. 2017) and health (Friedman et al. 2010; Steptoe et al. 2015), as well as between leisure or relaxation and SWB (Brajsa-Zganec et al. 2011; Kuykendall et al. 2015; Newman et al. 2014).

Life satisfaction, one of the SWB components, is an overall evaluation of quality of life and interchangeable with subjective well-being or happiness (Veenhoven 2000; Yun et al. 2019). Life satisfaction consists of three categories of determinants: personal and demographic factors, economic factors, and institutional factors (Frey and Stutzer 2000). There is a similar life satisfaction subdomain classification, which includes family, health, civic engagement, life satisfaction, income, leisure, social relationship, housing, community, job, and environment (Florida et al. 2013; OECD 2018).

Residential Satisfaction and Subjective Well-Being

Residential satisfaction, defined as a "positive affective" psychological state that individual residents experience toward their residential environment, has been studied as an important factor affecting the SWB of residents (Amerigo and Aragones 1997). Amerigo and Aragones (1997) argued that the determinants of residential satisfaction are objective environmental attributes, subjective evaluation of environmental attributes, and residents' personal characteristics. Individual residents' satisfaction levels are determined by subjective evaluation of objective environmental attributes, and an individual's subjective evaluation is influenced by personal characteristics (Amerigo and Aragones 1997). Empirical studies that deal with residential satisfaction as a measure of environmental quality, treat residential satisfaction as an outcome variable (De Jong et al. 2012; Van Dyck et al. 2011; Huang and Du 2015). Other studies, however, regard it as an explanatory variable of residents' behavioral and psychological outcomes, such as SWB (Prieto-Flores et al. 2011; Wang et al. 2019).

Residential satisfaction is a consequence of subjective evaluation of the physical environment, which can be one factor in increased SWB. Researchers have investigated physical environment elements such as street type, green space of tree coverage, sidewalks, open space, on-street parking, and community space (Abass and Tucker 2018; Nickelson et al. 2013; Wilkerson et al. 2012); neighborhood amenities such as community centers, playgrounds, and libraries (An et al. 2017; Liu et al. 2017); and accessibility to life, including healthcare service, natural service, and natural environment (Li et al. 2019) as important variables for explaining subjective well-being and life satisfaction.

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Social Capital and Subjective Well-Being

Social capital, defined as residents' ability to collaborate in carrying out common goals, is formed through face-to-face interaction in small groups, thereby ameliorating residents' SWB (Svendsen and Svendsen 2004; Helliwell 2006). Social capital is one determinant of SWB, like life satisfaction, and urban planners or public policymakers have, therefore, emphasized the coordination of social relationships in neighborhood activities in many countries (Helliwell 2006). Researchers have discussed a variety of dimensions of social capital, including social relationships, a sense of community, quality of health, voting turnout increased from political participation, and serving of common interests such as civic solidarity (Putnam 1995; Inglehart and Welzel 2005, p. 141; Long and Perkins 2007; Perkins and Long 2002).

Among the dimensions, sense of community, defined as "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 need," has been widely used as an indicator of SWB (Hughey et al. 1999; McMillan et al. 1986; Perkins and Long 2002). Key components of a sense of community are mutual interdependence, connectedness, trust, interactivity, common expectations, shared goals, and overlapping histories among community members (Rovai 2002). Neighboring is a behavioral element of social capital, including informal assistance and information sharing among neighbors (Woldoff 2002; Perkins and Long 2002). Neighboring encompasses casual daily interaction and friendship-oriented interaction (Woldoff 2002). Lastly, there is citizen participation, as occurs in neighborhoods, faith-based communities, or other grassroots community organizations (Perkins and Long 2002). Citizen participation ensures enduring neighborhood plans by raising trust, credibility, and commitment regarding the implementation of policies (Brody et al. 2003; Burby 2003; Innes 1996). Political participation, revealed by voting turnouts, is a crucial form of citizen participation and can be enhanced through more civic involvement and civic solidarity (Putnam 1995; Inglehart and Welzel 2005).

Housing Type and Residential Satisfaction, Social Capital, and Subjective Well-Being

The majority of the studies on housing type and residential satisfaction conducted in Western countries showed higher residential satisfaction levels of single-family detached dwellings than high-rise multifamily apartments among residents (Howley 2010; Reid 1994). For example, Hoekstra (2005) compared average satisfaction with the housing situation of residents in single-family dwellings and apartments in 12 EU countries. Their analysis found that in most EU countries, residents in single-family dwellings are more satisfied with their residential environments than those in apartments, except for those in Portugal and Greece. Winston (2017), analyzing the European Social Survey, also identified the trend of higher satisfaction with single-family dwellings than multifamily dwellings. However, the author concluded that residing in multifamily housing is not a statistically significant predictor of life satisfaction after controlling for relevant sociodemographic variables such as health and income. In this vein, some researchers argue that many people do not want to live in high-density residential areas (Howley 2010) and call for lower-density housing developments to attract the family market. However, studies that focused on cases in Korea generally showed higher satisfaction with apartments than with single-family or low-rise multifamily dwellings (Lim 2014; Kim and Lee 2018), which reflects the characteristics of the Korean housing market, in which apartments are the most preferred.

In many empirical studies on social capital, housing type was included as a control variable, and few previous studies investigated the influence of housing type on social capital on a neighborhood scale. Kleinhans et al. (2007) analyzed residents' social capital in two recently restructured neighborhoods in Rotterdam. This study used a social capital index that composited 22 indicators on social interactions, norms, and trust. Their linear regression model found that single-family dwellings are associated with a higher level of social capital than multifamily housing. However, this analysis focused on a social capital index that averaged all indicators measuring different social capital dimensions. Another empirical study in Korea analyzed the influence of housing type on three types of social capital: informal social ties, participation, and trust (Kwak 2003). Their analysis found that apartment residents have a lower level of trust in neighbors than those in other types of dwellings but failed to identify differences in social ties and participation.

Other researchers have examined the influence of housing type on mental health and psychological well-being. Evans (2003) reviewed relevant studies and argued that high-rise, multifamily dwelling units are disadvantageous to psychological well-being. However, this trend is particularly pronounced among vulnerable residents such as low-income families, old residents, and mothers with young children (Gibson et al. 2011). However, previous studies have often lacked controls for potentially confounding variables such as socioeconomic variables, housing tenure, housing quality, and neighborhood quality (Evans et al. 2003; Gibson et al. 2011). These studies discussed psychosocial processes that may explain linkages between housing and psychological well-being, such as identity, insecurity, social support, parenting, and control.

Conceptual Model and Research Questions

Despite the existence of relevant previous studies, few have comprehensively investigated residential satisfaction, social capital, and SWB. For example, although there are studies that investigate the correlation between social capital and physical environment, few studies, analyzing the association between social capital and SWB, incorporate the aspects of physical characteristics or amenities in neighborhoods (Wilkerson et al. 2012). Therefore, the present study aims to fill this gap by analyzing multiple associations of SWB with physical and social neighborhood environments, which are represented by residential satisfaction and social capital. Furthermore, the emphasis of this study is on the influence of housing type, comparing high-rise apartments mostly in new towns with low-rise residences, on SWB, which has rarely been investigated in previous empirical studies.

Fig. 2 depicts the conceptual model relating housing type and residents' residential satisfaction and social capital levels, socioeconomic characteristics, and SWB. The model posits that the residents' housing type and other personal characteristics influence their residential satisfaction and social capital levels. Also, residential satisfaction, which is determined by an evaluation of their physical environments, and social capital, which assesses the social environments of their community, are expected to affect the residents' SWB. Therefore, individuals' housing type is hypothesized to influence SWB directly and indirectly via physical and social environmental attributes. Based on this model, the present study attempts to answer the following questions:

Does Housing Type Influence Residents' Subjective Well-Being?

Multifamily apartment complexes are typically designed to provide convenience facilities, parking lots, management offices, and security, as well as social organizations and public spaces such as

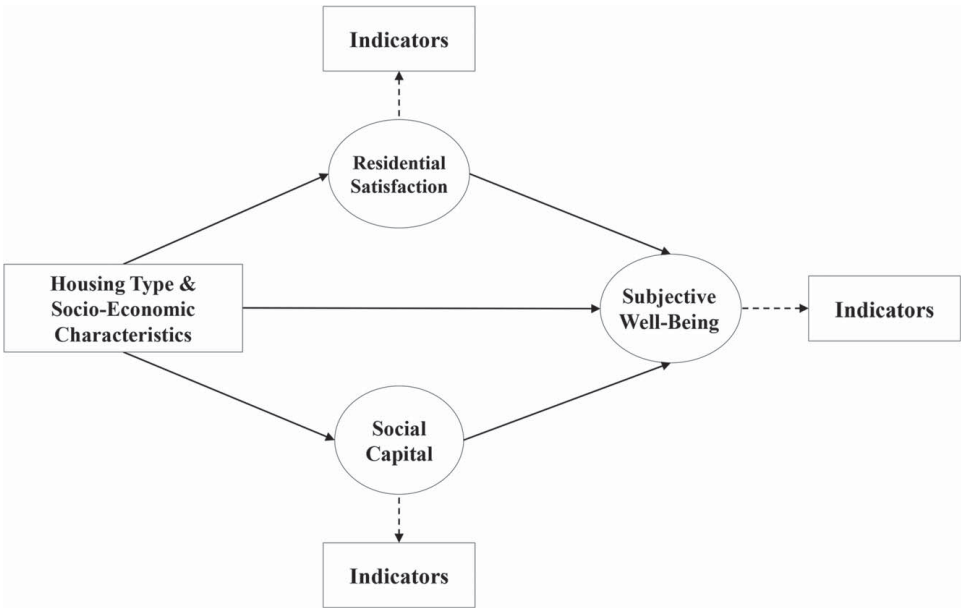

Fig. 2. Conceptual model.

playgrounds, where casual social interactions may occur. Therefore, the SWB level of apartment residents is expected to be higher than those of old low-rise dwellings due to easy maintenance, convenience facilities, safety, and the social environments, both formal and informal, of apartment complexes.

How do Individuals' Residential Satisfaction and Social Capital Play a Role in the Correlation between Their Housing Type and Subjective Well-Being?

While housing type can be directly correlated with SWB levels, the physical and social environments of different housing types may intervene in their impact on SWB. For example, residents living in apartments may be more satisfied with their residential environments than those in low-rise residential areas because of apartment amenities, easy parking, better security, and centralized management, which may eventually improve the SWB of apartment residents. In terms of social environments, apartments, due to their high-rise structure, are perceived to discourage social contact and, thus, are disadvantageous to the formation of social capital that can improve SWB. In this case, living in apartments may be indirectly and negatively associated with SWB through social capital. However, the rival hypothesis is that the social capital levels of residents in apartments are greater than those in low-rise residential areas because of formal social contact led by a management organization and communities connected to the school district.

By testing these hypotheses, the authors seek to reveal the influence of residential environments on the residential satisfaction, social capital, and overall SWB of residents. The results are expected to enhance a comprehensive understanding of the relationship between physical and social environments and SWB in urbanized regions.

Setting and Method

Context

Gyeonggi-do, the area under study, is a province that forms the capital area of the Republic of Korea, along with Seoul and Incheon. Gyeonggi-do has 28 cities and three counties, occupying an area of 10,183.46 km^2. The population of Gyeonggi-do is approximately 13.7 million citizens, which is 26.5% of the Korean population. It includes a wide range of urban environments, from relatively underdeveloped northern areas facing North Korea to the ICT and semiconductor industrial areas in the southern part of the province. A total of 16 new towns have been developed in Gyeonggi-do since Bundang New Town was developed in the late 1980s. These new towns provided large-scale, high-rise apartments, creating residential environments different from low-rise dwellings in the old urban areas. This combination renders Gyeonggi-do a suitable area to study the impact of various residential environments on residents' SWB. Further, Gyeonggi-do has prepared for more new towns, including apartment housings for 54,000 people in 2028.

Survey Design and Data

The Gyeonggi Research Institute conducted a quality-of-life survey in 2016, concentrating on the domains of family, housing, employment, household finance, transportation, social integration, SWB, and other basic information. This survey focused on subjective indicators of well-being levels rather than objective indicators, because the researchers and policymakers judged that economic factors such as GDP growth and household income cannot fully measure actual well-being levels.

To measure the residential satisfaction, social capital, and quality of life of Gyeonggi-do residents, the researchers of the Gyeonggi Research Institute developed survey questions based on previous instruments (Brajsa-Zganec et al. 2011; Pavot and Diener 1993; Ha 2010; Yanmei 2012; Lin 2019; Wilkerson et al. 2012; Hoogerbrugge and Burger 2018). A focus group of experts was formed to finalize the indicators by modifying questions inappropriate for the Korean context and adding indicators suggested by the experts. The finalized indicators were categorized into three latent constructs: SWB, social capital, and residential satisfaction (Table 1). The indicators for SWB were categorized into three dimensions: positive emotion, healthy habits, and relaxation. Similarly, three dimensions (i.e., sense of community, neighboring, and political participation) made up the social capital construct. The residential satisfaction construct consisted of three dimensions: amenities, parking, and traffic safety satisfaction. Lastly, the survey instruments included questions about residents' housing and socioeconomic status (Table 2). The survey

Table 1. Descriptive statistics of latent variable indicators ($n = 20{,}000$)

Underlying constructs	Dimensions	Indicators	Mean	S.D.
Subjective well-being	Positive emotion	I think I am living the ideal life[a]	3.265	0.773
		I am satisfied with my present life[a]	3.520	0.713
		I have felt a sense of accomplishment in the last week	2.690	0.703
		I have felt a sense of comfort in the last week	2.976	0.627
		I have felt happiness in the last week	2.986	0.570
		Average	3.087	
	Health	I exercise regularly for good health	2.681	0.738
		I manage my eating habits for my health	2.744	0.710
		I am interested in health (4-point Likert scale)	2.942	0.658
		Average	2.789	
	Relaxation	I am not stressed by my amount of sleep	2.989	0.546
		I am getting enough sleep	2.910	0.568
		I am not stressed by the quality of my sleep	2.960	0.578
		I have enough leisure time	2.780	0.658
		Average	2.910	
Residential satisfaction	Amenity satisfaction	I am satisfied with the cultural space of our district	2.712	0.759
		I am satisfied with the neighborhood facilities in our district	2.884	0.700
		I am satisfied with the public institutions in our district	2.910	0.684
		I am satisfied with the welfare facilities in our district	2.870	0.645
		I am satisfied with my local medical institution	3.120	0.569
		I am satisfied with my local market	2.982	0.656
		Average	2.913	
	Parking satisfaction	I am satisfied with the safety of the parking lot	2.788	0.718
		The parking lot has sufficient capacity	2.777	0.682
		Illegal parking enforcement is well implemented	2.741	0.683
		Average	2.769	
	Traffic safety satisfaction	The child protection zone in our area is safe	2.861	0.701
		The commuting routes around schools are safe	2.889	0.705
		Crosswalks in our area are safe	2.737	0.671
		Average	2.829	
Social capital	Sense of community	I feel a sense of belonging in the neighborhood where I live	2.956	0.728
		I feel a sense of belonging in my village/town	3.067	0.720
		I feel a sense of belonging in my city	2.907	0.723
		I feel a sense of belonging in Gyeonggi-do, where I live	2.888	0.690
		Average	2.955	
	Neighboring	I often help my neighbors	2.492	0.824
		I often get help from my neighbors	2.529	0.779
		I trust my neighbors	2.757	0.776
		Average	2.593	
	Citizen participation	I recently voted in a local election (0, not voted; 1, voted)[b]	0.763	—
		I recently voted in a congressional election (0, not voted; 1, voted)[b]	0.800	—
		I recently voted in a presidential election (0, not voted; 1, voted)[b]	0.889	—
		Average	0.817	

[a]5-Point Likert scale.
[b]Dummy; otherwise, 4-point Likert scale.

Table 2. Descriptive statistics of personal variables ($n = 20{,}000$)

Variables	Indicators	Mean	SD	Min.	Max.
Apartment	Type of house (0, otherwise; 1, apartment)	0.41	—	0	1
Own house	Type of house occupation (0, otherwise; 1, own house)	0.60	—	0	1
Residence period	Residence period (year)	10.58	10.68	1	88
Ln(Residence period)	Log transformation of residence period	2.01	0.82	0	4.48
Ln(Residence period)^2	Squared log transformation of residence period	4.71	3.54	0	20.05
Male	Gender (0, female; 1, male)	0.85	—	0	1
Age	Resident's age (10 years old)	5.13	1.43	1.9	9.5
Age^2	Squared resident's age	28.34	15.20	3.61	90.25
College	Education level (0, otherwise; 1, college or higher)	0.47	—	0	1
High school	Education level (0, otherwise; 1, high school)	0.41	—	0	1
Middle school (base)	Education level (0, otherwise; 1, less than middle school)	0.12	—	0	1
Income	Average monthly household income ($10)	342.71	169.76	30	4,500
Ln(Income)	Log transformation of average monthly household income (continuous variables)	5.71	0.52	3.40	8.41
Regular worker	Occupational status (0, otherwise; 1, regular worker)	0.63	—	0	1
Irregular worker	Occupational status (0, otherwise; 1, irregular worker)	0.15	—	0	1
Self-employed	Occupational status (0, otherwise; 1, self-employed)	0.07	—	0	1
Unemployed (base)	Occupational status (0, otherwise; 1, unemployed)	0.15	—	0	1

samples proportional to each local population were adults living in 28 cities and 3 counties in Gyeonggi-do. Using telephone and email, 22,000 respondents were recruited from the residents of Gyeonggi-do who were more than 19 years old. There were at least 600 respondents for each city or county. The respondents were stratified by housing types, according to the share of each housing type in Gyeonggi-do (see Appendix). Trained surveyors conducted face-to-face surveys between July 1 and August 5, 2016, until 20,000 completed survey sheets were collected (Fig. 3).

Fig. 3. Research area.

Structural Equation Modeling

Measuring latent constructs such as "quality of life" is the analytical change of the present study. Previous studies, which have applied statistical methods without latent variables, are limited in identifying and measuring the concepts' underlying dimensions (Wilkerson et al. 2012; Liu et al. 2017; Hoogerbrugge and Burger 2018). However, simple regression models are limited to explaining the intermingled relationship among the latent constructs. This limitation can be overcome by employing SEM, which is a sophisticated multivariate analysis that can examine the complex relationship between exogenous, mediating, and endogenous latent variables and observed variables (Ryu et al. 2018). SEM simultaneously estimates a measurement model that extracts latent variables from indicators and a structural model that examines the correlation between the latent variables and the other observed variables. The authors used structural equation models to analyze the influence of housing type on SWB, both directly and indirectly via a perceived evaluation of physical and social environments, controlling for socioeconomic factors (Fig. 4). The models in this study were estimated using the statistical software Stata 16.

Measurement Model

$$\boldsymbol{I}_{1i} = \boldsymbol{L}_1\boldsymbol{\alpha} + \boldsymbol{\varepsilon}, \quad \boldsymbol{\varepsilon} \sim N(0, \boldsymbol{\psi}_{\varepsilon}\ \text{diagonal}) \tag{1}$$

where $\boldsymbol{L}_1$ = residential noise satisfaction

$$\boldsymbol{I}_{2i} = \boldsymbol{L}_2\boldsymbol{\beta} + \boldsymbol{\varepsilon}, \quad \boldsymbol{\varepsilon} \sim N(0, \boldsymbol{\psi}_{\varepsilon}\ \text{diagonal}) \tag{2}$$

where $\boldsymbol{L}_2$ = residential satisfaction

$$\boldsymbol{I}_{3i} = \boldsymbol{L}_3\boldsymbol{\gamma} + \boldsymbol{\mu}, \quad \boldsymbol{\mu} \sim N(0, \boldsymbol{\psi}_{\mu}\ \text{diagonal}) \tag{3}$$

where $\boldsymbol{L}_3$ = social capital

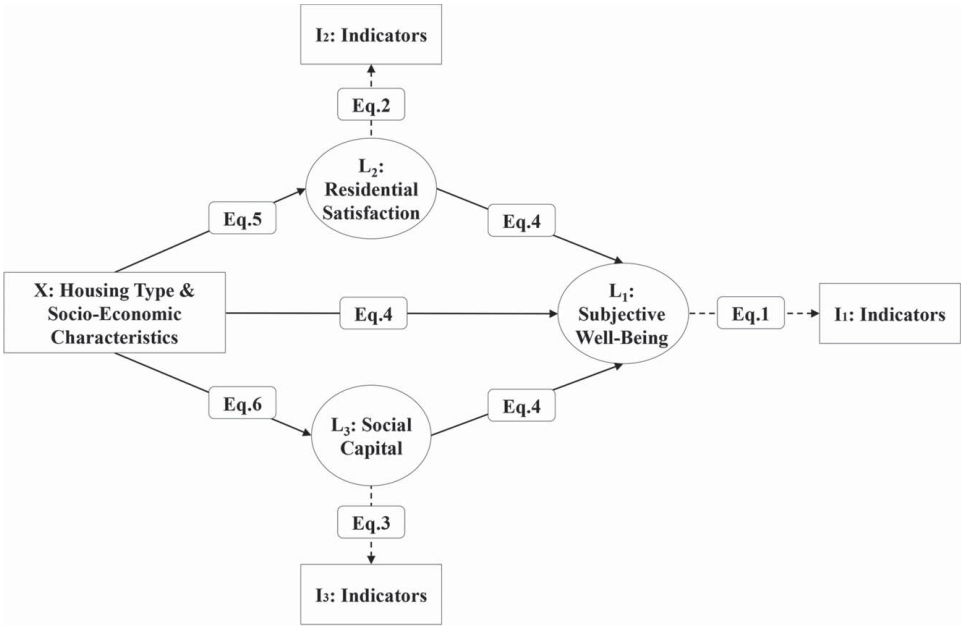

Fig. 4. SEM equations estimating relationships among quality of life: residential satisfaction, social capital, and the objective socioeconomic characteristics of residents.

Structural Model

$$\boldsymbol{L}_1 = \boldsymbol{L}_2\boldsymbol{\eta} + \boldsymbol{L}_3\boldsymbol{\theta} + \boldsymbol{X}\boldsymbol{\vartheta} + \boldsymbol{\varsigma}, \quad \boldsymbol{\varsigma} \sim N(0, \boldsymbol{\varphi}_{\varsigma}\text{diagonal}) \tag{4}$$

$$\boldsymbol{L}_2 = \boldsymbol{X}\boldsymbol{\rho} + \boldsymbol{\delta}, \quad \boldsymbol{\delta} \sim N(0, \boldsymbol{\varphi}_{\delta}\,\text{diagonal}) \tag{5}$$

$$\boldsymbol{L}_3 = \boldsymbol{X}\boldsymbol{\omega} + \boldsymbol{\tau}, \quad \boldsymbol{\tau} \sim N(0, \boldsymbol{\varphi}_{\tau}\,\text{diagonal}) \tag{6}$$

where $\boldsymbol{L}$ = latent variables; $\boldsymbol{X}$ = socioeconomic characteristics; $\boldsymbol{\alpha}$, $\boldsymbol{\beta}$, $\boldsymbol{\gamma}$, $\boldsymbol{\eta}$, $\boldsymbol{\theta}$, $\boldsymbol{\vartheta}$, $\boldsymbol{\rho}$, $\boldsymbol{\omega}$ = unknown parameters; $\boldsymbol{I}$ = indicators of $\boldsymbol{L}$; $\boldsymbol{\psi}$, $\boldsymbol{\varphi}$ = covariances of random disturbance term; and $\boldsymbol{\varepsilon}$, $\boldsymbol{\mu}$, $\boldsymbol{\varsigma}$, $\boldsymbol{\delta}$, $\boldsymbol{\tau}$ = random disturbance term.

Measures and Descriptive Statistics

The definitions and descriptive statistics of indicators for latent variables are listed in Table 1. The survey includes 60 indicators that are designed to measure latent variables in the three constructs: residential satisfaction with 19 indicators, social capital with 27 indicators, and SWB with 14 indicators. The authors conducted exploratory factor analysis to select appropriate indicators from the 60 total indicators to extract latent variables. Most indicators are measured on a 4-point Likert scale, but some are measured on a 5-point Likert scale or binary scale. Therefore, the indicators are standardized before the exploratory factor analysis to deal with different scales. As a result, a total of 34 indicators were selected (12 indicators for residential satisfaction, 10 indicators for social capital, and 12 indicators for SWB) to hypothesize a latent variable structure with three latent variables (*Positive Emotion*, *Health*, and *Relaxation*) for SWB, three latent variables (*Sense of Community*, *Neighboring*, and *Citizen Participation*) for social capital, and three latent variables (*Amenity Satisfaction*, *Parking Satisfaction*, and *Traffic Safety Satisfaction*) for residential satisfaction.

The definitions and descriptive statistics of personal variables are presented in Table 2. The question predictor, *Apartment*, is a dummy variable that discerns apartment residents from those living in low-rise dwellings. Approximately 42% of the participants live in apartments. Other personal variables are included in the analysis to control for the influence of individual attributes. About 60% of respondents own their homes. On average, the participants have resided in their current housing for 10.58 years. In the sample, 85% of the participants are male. The sample areas are quite aged neighborhoods, in that the residents' average age is 51.3 years old. Most respondents are well-educated: 47% have a college degree or higher and 41% finished high school as their highest attained education. The respondents' median monthly income is approximately $3,400. Most respondents are employed, including regular workers (63%), irregular workers (15%), and self-employed workers (7%). Two continuous variables (*Residential Period* and *Income*) are natural-log-transformed to remedy their skewed distributions. The quadratic form of *Age* is included to account for nonlinear relationships between *Age* and other variables.

Results

A SEM is composed of two models: a measurement model and a structural model. The measurement model that measures latent variables is reported in Table 3, and the structural model that examines the relationship between the latent and the observed variables is shown in Tables 4–6.

Measurement and Model Fit

To confirm the validity of the latent variable structure with the selected indicators through the exploratory factor analysis, the authors carried out confirmatory factor analysis (CFA) that is used to determine which indicators are most highly correlated with the latent variables (Table 3). The measurement model results indicate that the latent variables are successfully extracted because the indicators' coefficients are statistically significant and sufficiently large (greater than 0.60 except for one). The values of the fit indexes, including the root-mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI), and standardized root mean square residual (SRMR), evaluate the SEM to be fit. The values of the fit indexes in Table 3 (RMSEA: 0.033, CFI: 0.912, TLI: 0.901, and SRMR: 0.055) show that the latent variable structure reasonably fits the data, satisfying general guidelines for the fit indices: RMSEA less than 0.06, SRMR less than 0.08, and CFI and TLI values greater than 0.90 indicate an acceptable model fit (Hu and Bentler 2009).

Direct Effects on Residential Satisfaction

The structural model is employed to test the impact of living in apartments on residential satisfaction, social capital, and SWB (Tables 4–6). The full SEM model result is summarized in Fig. 5. The authors excluded insignificant effects in Fig. 5 to emphasize the significant effects between the variables.

The SEM results confirmed the hypothesis that living in apartments affects the satisfaction levels of the residents (Table 4). The results indicated that *Apartment* is correlated with the three dimensions of residential satisfaction (*Amenity satisfaction*, *Parking Satisfaction*, and *Traffic Safety Satisfaction*), implying that people living in apartments tend to be more satisfied with their residential environments than those living in low-rise residential areas.

Regarding covariates, homeowners are more likely to be satisfied with their residential environments than their counterparts. The models identified the nonlinear relationship between length of residence and amenity satisfaction and parking satisfaction levels. The correlations between residents' age and amenity satisfaction and traffic safety satisfaction levels are also nonlinear. Residents with higher education levels and higher income levels tend to show higher satisfaction levels in the three dimensions. Regular workers are less likely to be satisfied with the amenities of their neighborhoods, while irregular workers and the self-employed are more likely to be satisfied with the parking environments.

Direct Effects on Social Capital

The SEM results in Table 5 partially confirm the hypothesis that living in apartments affects social capital levels. *Apartment* is significantly and negatively correlated with *Neighboring*, while not significantly associated with *Sense of Community* and *Citizen Participation*. This result indicates that residents of apartments tend to have casual interaction with neighbors less frequently compared with those in low-rise residential areas. However, the model found no evidence to confirm a significant difference in sense of community and citizen participation levels between apartment and low-rise dwelling residents.

Homeowning, male, and higher-income residents tend to have higher social capital levels, including all three dimensions: *Sense of community*, *Neighboring*, and *Citizen Participation*. The models found a nonlinear relationship between length of residence and sense of community levels. Residents' age is also nonlinearly

Table 3. Measurement model for structural equation modeling (SEM) ($n = 20{,}000$)

Measurement model	Coeff.	(SE)	*P*-value
Subjective well-being			
Positive emotion			
I think I am living the ideal life	1.000		
I am satisfied with my present life	0.909*	(0.010)	0.000
I have felt a sense of accomplishment in the last week	0.922*	(0.014)	0.000
I have felt a sense of comfort in the last week	0.765*	(0.013)	0.000
I have felt happiness in the last week	0.743*	(0.012)	0.000
Health			
I exercise regularly for good health	1.000		
I manage my eating habits for my health	0.988*	(0.014)	0.000
I am interested in health	0.674*	(0.011)	0.000
Relaxation			
I am not stressed by my amount of sleep	1.000		
I am getting enough sleep	0.971*	(0.012)	0.000
I am not stressed by the quality of my sleep	0.859*	(0.011)	0.000
I have enough leisure time	0.838*	(0.013)	0.000
Residential satisfaction			
Amenity satisfaction			
I am satisfied with the cultural space of our district	1.000		
I am satisfied with the neighborhood facilities in our district	0.912*	(0.013)	0.000
I am satisfied with the public institutions in our district	0.857*	(0.012)	0.000
I am satisfied with the welfare facilities in our district	0.828*	(0.012)	0.000
I am satisfied with my local medical institution	0.754*	(0.012)	0.000
I am satisfied with my local market	0.607*	(0.010)	0.000
Parking satisfaction			
I am satisfied with the safety of the parking lot	1.000		
The parking lot has sufficient capacity	0.859*	(0.010)	0.000
Illegal parking enforcement is well implemented	0.844*	(0.010)	0.000
Traffic safety satisfaction			
The child protection zone in our area is safe	1.000		
The commuting routes around schools are safe	0.871*	(0.011)	0.000
Crosswalks in our area are safe	0.751*	(0.010)	0.000
Social capital			
Sense of community			
I feel a sense of belonging in the neighborhood where I live	1.000		
I feel a sense of belonging in my city	0.863*	(0.009)	0.000
I feel a sense of belonging in my village/town	0.869*	(0.016)	0.000
I feel belong in Gyeonggi-do, where I live	0.717*	(0.014)	0.000
Neighboring			
I often help my neighbors	1.000		
I often get help from my neighbors	0.952*	(0.007)	0.000
I trust my neighbors	0.741*	(0.007)	0.000
Citizen participation			
I recently voted in a local election	1.000		
I recently voted in a congressional election	0.847*	(0.014)	0.000
I recently voted in a presidential election	0.524*	(0.010)	0.000
RMSEA		0.033	
CFI		0.923	
TLI		0.906	
SRMR		0.042	

*$P < 0.05$.

correlated with neighboring and citizen participation levels. Upon evaluating the relationship between education level and social capital, the results found that the higher the education levels, the lower the social capital level. Compared with the unemployed, regular workers have a lower sense of community levels; irregular workers have lower neighboring and citizen participation levels; and the self-employed have lower citizen participation levels.

Direct Effects on SWB

The direct effects of the residential satisfaction dimensions, social capital dimensions, and observed variables on SWB dimensions are displayed in Table 6. The model identified statistically significant and positive effects of all residential satisfaction and social capital dimensions on all SWB dimensions, confirming that residential satisfaction and social capital are determinants of SWB. However, no significant effects of *Apartment* on SWB dimensions were detected.

Homeowners tend to have higher positive emotion and relaxation levels; male residents tend to have higher SWB levels in all three dimensions; and higher-income residents tend to have higher positive emotion and health levels. The models found nonlinear relationships between length of residence and health levels, as well as between residents' age and positive emotion and

Table 4. Structural model for structural equation modeling (SEM) estimating the residential satisfaction dimensions

	Amenity satisfaction			Parking satisfaction			Traffic safety satisfaction		
Endogenous variables	Coeff.	(SE)	*P*-value	Coeff.	(SE)	*P*-value	Coeff.	(SE)	*P*-value
Apartment	0.123*	(0.008)	0.000	0.108*	(0.009)	0.000	0.028*	(0.009)	0.003
Own house	0.029*	(0.010)	0.003	0.047*	(0.011)	0.000	0.043*	(0.011)	0.000
Ln(Residence Period)	0.030	(0.019)	0.106	−0.181*	(0.021)	0.000	−0.041	(0.021)	0.055
Ln(Residence Period)^2	−0.017*	(0.004)	0.000	0.048*	(0.005)	0.000	0.002	(0.005)	0.691
Male	0.020	(0.011)	0.067	−0.002	(0.013)	0.844	0.014	(0.013)	0.272
Age	−0.074*	(0.023)	0.002	−0.009	(0.027)	0.725	−0.080*	(0.027)	0.003
Age^2	0.010*	(0.002)	0.000	0.002	(0.003)	0.360	0.011*	(0.003)	0.000
High school	0.032*	(0.015)	0.031	−0.062*	(0.017)	0.000	−0.055*	(0.017)	0.001
College	0.059*	(0.017)	0.001	−0.057*	(0.019)	0.003	−0.037	(0.019)	0.055
Ln(Income)	0.106*	(0.010)	0.000	0.102*	(0.011)	0.000	0.075*	(0.011)	0.000
Regular worker	−0.042*	(0.015)	0.006	0.019	(0.017)	0.269	−0.014	(0.017)	0.434
Irregular worker	0.005	(0.016)	0.741	0.082*	(0.018)	0.000	0.020	(0.019)	0.269
Self-employed	−0.010	(0.020)	0.627	0.074*	(0.023)	0.001	0.041	(0.023)	0.077
Equation-level R^2		0.039			0.030			0.013	

*$P < 0.05$.

Table 5. Structural model for structural equation modeling (SEM) estimating the social capital dimensions

	Sense of community			Neighboring			Citizen participation		
Endogenous variables	Coeff.	(SE)	*P*-value	Coeff.	(SE)	*P*-value	Coeff.	(SE)	*P*-value
Apartment	−0.005	(0.010)	0.607	−0.136*	(0.011)	0.000	0.007	(0.005)	0.213
Own house	0.068*	(0.012)	0.000	0.070*	(0.013)	0.000	0.050*	(0.007)	0.000
Ln(Residence Period)	−0.069*	(0.022)	0.002	0.054*	(0.025)	0.031	0.014	(0.012)	0.259
Ln(Residence Period)^2	0.027*	(0.005)	0.000	0.008	(0.006)	0.159	0.000	(0.003)	0.969
Male	0.032*	(0.013)	0.015	−0.035*	(0.015)	0.018	0.075*	(0.007)	0.000
Age	0.022	(0.028)	0.424	0.127*	(0.031)	0.000	0.144*	(0.016)	0.000
Age^2	0.004	(0.003)	0.178	−0.008*	(0.003)	0.008	−0.010*	(0.002)	0.000
High School	−0.097*	(0.017)	0.000	−0.135*	(0.020)	0.000	−0.010	(0.010)	0.317
College	−0.122*	(0.020)	0.000	−0.187*	(0.023)	0.000	0.016	(0.011)	0.148
Ln(Income)	0.111*	(0.011)	0.000	0.086*	(0.013)	0.000	0.048*	(0.006)	0.000
Regular worker	−0.053*	(0.018)	0.003	−0.070*	(0.020)	0.000	−0.004	(0.010)	0.661
Irregular worker	−0.005	(0.019)	0.784	−0.055*	(0.022)	0.011	−0.031*	(0.011)	0.004
Self-employed	−0.030	(0.024)	0.201	−0.027	(0.027)	0.318	−0.059*	(0.014)	0.000
Equation-level R^2		0.072			0.075			0.069	

*$P < 0.05$.

Table 6. Structural model for structural equation modeling (SEM) estimating the SWB dimensions

	Positive emotion			Health			Relaxation		
Endogenous variables	Coeff.	(SE)	*P*-value	Coeff.	(SE)	*P*-value	Coeff.	(SE)	*P*-value
Amenity satisfaction	0.218*	(0.010)	0.000	0.118*	(0.011)	0.000	0.060*	(0.009)	0.000
Parking satisfaction	0.112*	(0.009)	0.000	0.143*	(0.011)	0.000	0.065*	(0.008)	0.000
Traffic safety satisfaction	0.046*	(0.010)	0.000	0.089*	(0.011)	0.000	0.080*	(0.009)	0.000
Sense of community	0.076*	(0.009)	0.000	0.127*	(0.010)	0.000	0.079*	(0.008)	0.000
Neighboring	0.079*	(0.006)	0.000	0.035*	(0.007)	0.000	0.061*	(0.006)	0.000
Citizen participation	0.199*	(0.014)	0.000	0.194*	(0.016)	0.000	0.043*	(0.013)	0.001
Apartment	0.004	(0.008)	0.563	−0.013	(0.009)	0.142	−0.001	(0.007)	0.845
Own house	0.073*	(0.009)	0.000	0.007	(0.010)	0.478	0.036*	(0.008)	0.000
Ln(Residence period)	−0.012	(0.017)	0.493	−0.005	(0.020)	0.786	0.008	(0.015)	0.618
Ln(Residence period)^2	0.003	(0.004)	0.421	−0.012*	(0.005)	0.011	−0.004	(0.004)	0.308
Male	0.052*	(0.010)	0.000	0.032*	(0.012)	0.007	0.021*	(0.009)	0.022
Age	−0.295*	(0.022)	0.000	−0.036	(0.025)	0.152	−0.138*	(0.019)	0.000
Age^2	0.026*	(0.002)	0.000	0.002	(0.002)	0.501	0.015*	(0.002)	0.000
High school	0.054*	(0.014)	0.000	−0.005	(0.016)	0.747	−0.028*	(0.012)	0.023
College	0.149*	(0.016)	0.000	0.014	(0.018)	0.427	−0.023	(0.014)	0.103
Ln(Income)	0.242*	(0.009)	0.000	0.121*	(0.010)	0.000	−0.004	(0.008)	0.594
Regular worker	0.028	(0.014)	0.050	−0.059*	(0.016)	0.000	−0.068*	(0.012)	0.000
Irregular worker	−0.001	(0.015)	0.945	−0.073*	(0.017)	0.000	−0.092*	(0.013)	0.000
Self-employed	0.055*	(0.019)	0.004	−0.047*	(0.022)	0.031	−0.112*	(0.017)	0.000
Equation-level R^2		0.294			0.157			0.117	

*$P < 0.05$.

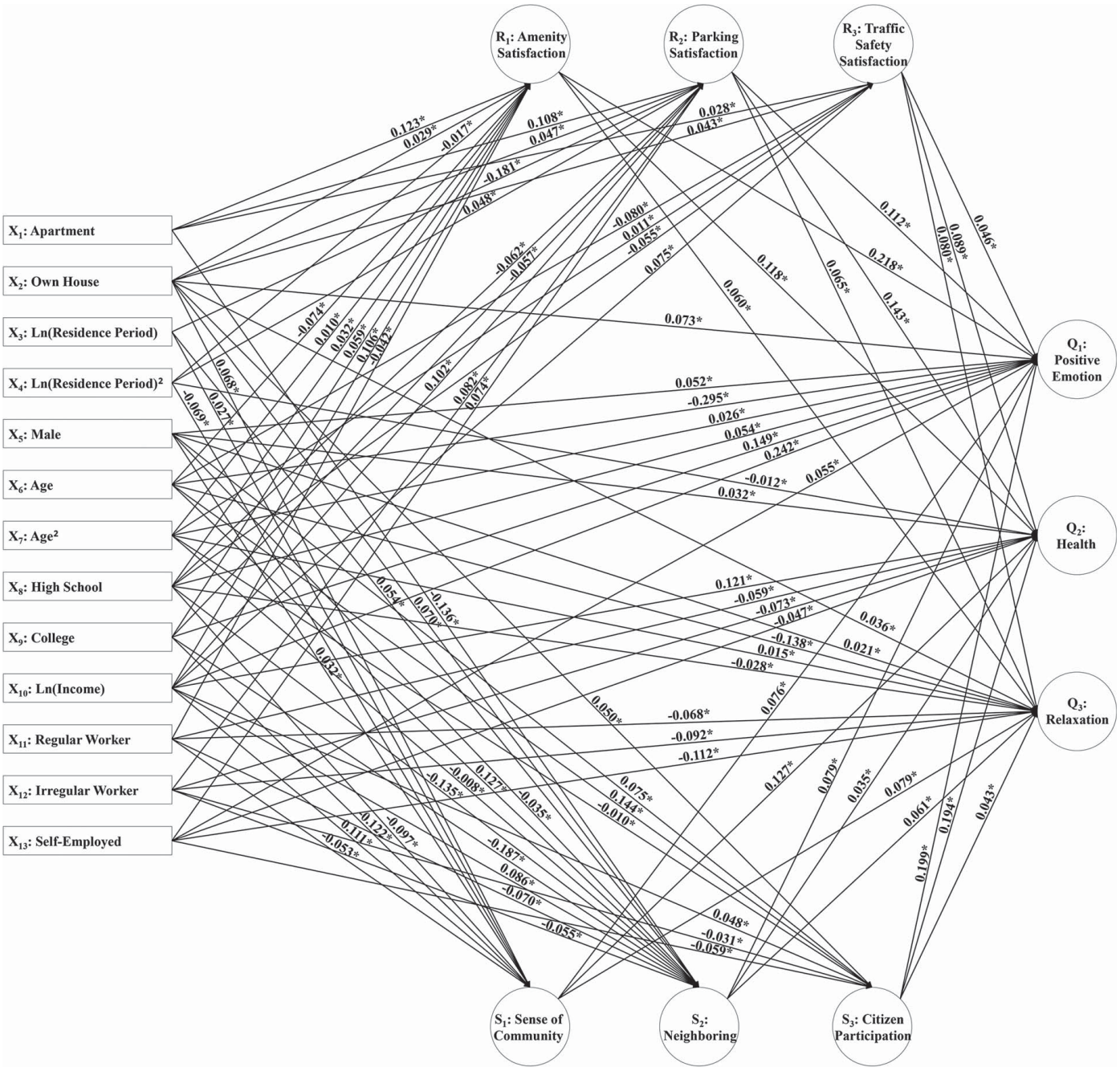

Fig. 5. Path diagram and SEM results. Results from models in Tables 3–6; *$P < 0.05$. (Sources: Esri, DeLorme, HERE, MapmyIndia.)

relaxation levels. Although the residents with higher education levels are likely to have higher positive emotion levels, residents with a high school degree are likely to have lower relaxation levels than those who have lower education levels. Relative to the unemployed, regular workers and irregular workers have lower health and relaxation levels. The self-employed have higher positive emotion levels, although they have lower health and relaxation levels.

Indirect and Total Effects of Apartment on SWB

The direct, indirect, and total effects of *Apartment* on the SWB dimensions are summarized in Table 7. Although the direct effects of *Apartment* on SWB dimensions are insignificant, some indirect effects of *Apartment* are significant. However, the indirect effects via residential satisfaction dimensions (amenity, parking, and traffic safety satisfaction) are positive, while the indirect effects via the social capital dimension (neighboring) are negative. Consequently, the negative indirect effects via social capital countervail positive indirect effects via residential satisfaction, attenuating the positive total effects of *Apartment* on the SWB dimensions.

Implications and Conclusions

In the process of urbanization in many regions of the world, modern apartments have been newly built on green land or have replaced traditional low-rise dwellings, which has brought about a major change to the physical and social environments experienced

Table 7. Direct, indirect, and total effects of *Apartment* on the SWB dimensions

Endogenous variables	Intervening variables	Indirect effect			Direct effects of apartment on SWB dimensions	Total effects of apartment on SWB dimensions
		Direct effects of apartment on intervening variables	Direct effects of intervening variables on SWB dimensions	Indirect effects of apartment on SWB dimensions		
Positive emotion	Residential satisfaction					
	Amenity satisfaction	0.123	0.218	0.027	—	0.027
	Parking satisfaction	0.108	0.112	0.012		0.012
	Traffic safety satisfaction	0.028	0.046	0.001		0.001
	Social capital					
	Sense of community	—	0.076	—	—	—
	Neighboring	−0.136	0.079	−0.011		−0.011
	Citizen participation	—	0.199	—		—
Healthy habits	Residential satisfaction					
	Amenity satisfaction	0.123	0.118	0.015	—	0.015
	Parking satisfaction	0.108	0.143	0.015		0.015
	Traffic safety satisfaction	0.028	0.089	0.002		0.002
	Social capital					
	Sense of community	—	0.127	—	—	—
	Neighboring	−0.136	0.035	−0.005		−0.005
	Citizen participation	—	0.194	—		—
Relaxation	Residential satisfaction					
	Amenity satisfaction	0.123	0.060	0.007	—	0.007
	Parking satisfaction	0.108	0.065	0.007		0.007
	Traffic safety satisfaction	0.028	0.080	0.002		0.002
	Social capital					
	Sense of community	—	0.079	—	—	—
	Neighboring	−0.136	0.061	−0.008		−0.008
	Citizen participation	—	0.043	—		—

Note: Only significant effects at the 0.05 alpha level are reported.

by residents. This study aimed to assess the influence of residential environments, comparing the two housing types, on residents' SWB, accounting for their evaluation of both physical and social environments, which are measured as residential satisfaction and social capital, respectively. While previous research has focused on the association between residential satisfaction and SWB or between social capital and SWB (Abass and Tucker 2018; Bramley and Power 2009), the present study comprehensively investigated the complex relationship between them. The authors analyzed the large-scale survey data that collected 20,000 responses from residents in Gyeonggi-do, Republic of Korea, utilizing the SEM to test the hypothesized relationship between housing type and SWB, as well as intervening latent variables: residential satisfaction and social capital dimensions. Therefore, the SEM tested the direct effects of housing type and indirect effects via residential satisfaction social capital on SWB.

Implications of the Analysis Results

Previous research has suggested that increasing residential satisfaction and social capital could lead to benefits for the public good (Light 2004; Prieto-Flores et al. 2011; Vidal 2004; Wang et al. 2019). In this vein, residents' residential satisfaction and social capital might represent desirable neighborhood environments to foster residents' SWB.

The EFA and CFA results are generally consistent with those of previous studies (Brajsa-Zganec et al. 2011; Pavot and Diener 1993) that categorized residential satisfaction dimensions (*Amenity Satisfaction*, *Parking Satisfaction*, and *Traffic Safety Satisfaction*), social capital dimensions (*Sense of Community*, *Neighboring*, and *Citizen Participation*), and SWB (*Positive Emotion*, *Health*, and *Relaxation*). Based on the latent structure and the relationship between the latent variables, the SEM showed that housing type plays a role in the level of residents' residential satisfaction, social capital, and SWB.

The results indicated that people living in apartments tend to be more satisfied with their residential environments such as amenities, parking lots, and safety from traffic, compared with those living in low-rise residential areas. This result disagrees with that in studies conducted in Western countries that found higher satisfaction levels among residents for single-family detached dwellings than for high-rise multifamily apartments (Hoekstra 2005; Howley 2010; Reid 1994). However, the results of this study reflect the Korean housing market, where people tend to prefer apartments to single-family or low-rise multifamily dwellings (Lim 2014; Kim and Lee 2018). Studies of other Asian housing markets also identified higher satisfaction with apartments than with single-family dwellings. For example, in a study on Tokyo's housing demand, Tiwari (2000) showed that 60% of homeowners had switched their preference from spacious single-family houses to apartments or condominiums because of the high cost of housing. The housing market of Beijing has also shifted toward medium- and high-rise apartment buildings over twenty stories (Wang and Li 2004).

Because of the Korean law on building permits, high-rise apartments can be built only when developers secure an amount of land large enough that it can be designed and developed as an apartment complex with community parking spaces, playgrounds, and other community facilities. Because building high-rise apartments is much more profitable than building single-family houses or low-rise apartments, Korean developers with large tracts of developable land do not want to build low-rise apartments. Therefore, multifamily apartment complexes in Korea typically include convenience facilities such as community gyms, daycare, community rooms, and

on-site parking lots. Moreover, new apartment complexes are designed with large underground parking lots that not only provide ample parking space but also separate pedestrian and traffic circulation. Therefore, residents can use the outdoor space in their complexes that is safely separated from traffic circulation, while occupying at least a single parking spot. Also, management offices operate the apartment complexes, and common security offices oversee safety.

On the other hand, under the same permit law, developers with small tracts of land are forced to build multifamily residential structures. These are called "villas" in Korea, which is contrary to the original Italian meaning. The villas are mostly three- to four-story buildings that do not have community facilities. In addition, both low-rise apartment complexes and stand-alone high-rise apartment buildings rarely exist in Gyeonggi-do. This is unusual, since stand-alone high-rise apartments are common in other countries, including Japan. Because of this housing market structure in Korea, most nonapartment residents in Gyeonggi-do live in single-family houses and low-rise multifamily housing without their own amenities, management and security offices, and sufficient parking spaces. Therefore, residents in low-rise residential areas must use public or private amenities, which are less accessible than facilities in their own residences and which compete with neighbors to secure on-street parking spaces because of insufficient on-site parking spaces. These differences between apartment complexes and low-rise residential areas may lead to higher satisfaction levels of apartment residents.

In terms of social capital, although no discernible differences in positive emotion and citizen participation are identified, apartment residents tend to interact with their neighbors less actively than those in low-rise residential areas. This result is generally consistent with that of previous studies (Kleinhans et al. 2007; Kwak 2003; Seo and Ha 2009) that criticized modern apartment developments that discourage informal social contact with neighbors. Despite formal social contact led by a management organization and community facilities that may induce casual contacts among neighbors, the architectural structure of a high-rise multifamily apartment might not be advantageous for encouraging interaction with neighbors to build social capital.

Another reason for the lower level of social capital of apartment residents may be the process of developing apartment complexes that replace old residential neighborhoods or green fields. Aged low-rise neighborhoods tend to form long-term community bonds, which enhance the social capital of the residents. However, when large-scale apartment complexes replace old towns, only a few original residents can move into the new apartments. This means that it is almost impossible to maintain the social capital of the old towns. Also, most apartment residents are newcomers who relocate from diverse areas and, therefore, will have little time to build social capital with neighbors.

The results showed that individual residents' residential satisfaction and social capital levels play a role as intervening factors when housing type influences SWB. The model detected no direct impact of living in apartments on the three SWB dimensions: positive emotion, health, and relaxation (Table 4). However, because all residential satisfaction and social capital dimensions are positively associated with all SWB dimensions, living in apartments is indirectly correlated with the SWB dimensions (Tables 4 and 5).

The direct, indirect, and total effects of living in apartments on the SWB dimensions, shown in Table 7, revealed that housing type's negative indirect effects via neighboring compensate for the positive indirect effects via residential satisfaction dimensions. Although residents living in apartments may be more satisfied with their apartments' amenities, easy parking, better security, and centralized management, which can improve their SWB, their high-rise structure, which discourages social contacts and, therefore, the formation of social capital, may weaken their SWB.

These countervailing effects raise crucial challenges for planners and policymakers. High-rise apartment complexes are one of the most popular development patterns in many developed and rapidly developing countries. In Korea, the higher satisfaction levels of apartment residents reflect their preference for apartment dwellings. Moreover, high-rise apartment development is an attractive option for housing policymakers who aim to rapidly provide mass dwellings. Consequently, apartments have become the most popular housing type in the Korean market. However, urbanization that has focused on apartment development replacing old towns has brought along with it social side effects by accelerating the dissolution of existing communities. The residents of "new towns" are from various regions and become neighbors without local traditions or social ties. In addition, the structure of apartment buildings is disadvantageous to social contacts and interactions among neighbors, which weakens social capital and quality of life.

Therefore, to minimize the negative influence of apartment-oriented developments and improve SWB, it is crucial to implement urban development in a way that secures the social capital of the new towns and maintains the social networks of existing cities. Apartment complexes should be designed to facilitate social interactions by including more common spaces and community facilities where neighbors can meet. Physical design may not be sufficient to promote social interactions. Social programs such as recreation programs, education programs, and flea markets may promote social activities using community facilities and increase interactions among neighbors. Also, new developments should be in harmony with old towns that have established social capital rather than demolishing them. In the long term, such urban developments that balance physical improvements and social capital will contribute to better SWB of citizens in cities that face similar problems of urbanization.

Shortcomings and Future Research

Although the present study sheds light on the influence of residential environments on SWB, the results are relevant only to a specific region and may not be generalized. Some results of the present study are quite different from those of previous studies conducted in Western countries, which reported lower satisfaction levels of apartment residents (Howley 2010; Reid 1994). Parallel studies in other regions with demographic and geographic contexts different from that of Gyeonggi-do should decipher the mechanism, such as cultural and economic contexts, that leads to the conflicting results and enhance the external validity of the present study.

Also, the present study cannot fully interpret all dimensions of residential satisfaction, social capital, and SWB. While developing indicators from relevant studies (Brajsa-Zganec et al. 2011; Pavot and Diener 1993; Ha 2010; Yanmei 2012; Lin 2019; Wilkerson et al. 2012; Hoogerbrugge and Burger 2018), the authors excluded indicators that cannot effectively extract latent variables through exploratory factor analysis and confirmatory factor analysis. Better indicators, developed from pilot studies, may make it possible to test more latent structures. Future studies that investigate more comprehensive residential satisfaction, social capital, and SWB dimensions should shed light on the social influence of neighborhood revitalization through resident participation.

Appendix. Survey Samples by City or County

Cities and counties	Apartment	Other	Total
Suwon-si	453	506	873
Seongnam-si	417	500	834
Goyang-si	453	439	805
Bucheon-si	356	484	768
Yongin-si	539	303	760
Ansan-si	259	538	722
Anyang-si	335	406	679
Namyangju-si	329	388	653
Hwaseong-si	233	473	637
Uijeongbu-si	251	433	624
Siheung-si	276	411	619
Pyeongtaek-si	150	535	619
Paju-si	215	449	607
Uiwang-si	322	338	600
Yeoncheon-gun	77	583	600
Icheon-si	189	467	600
Pocheon-si	167	489	600
Hanam-si	188	472	600
Osan-si	387	273	600
Gapyeong-gun	138	522	600
Yeoju-si	79	581	600
Yangpyeong-gun	87	573	600
Yangju-si	236	425	600
Dongducheon-si	193	471	600
Gimpo-si	249	411	600
Gunpo-si	421	240	600
Guri-si	262	402	600
Gwangju-si	157	503	600
Gwangmyeong-si	242	412	600
Gwacheon-si	334	326	600
Anseong-si	177	483	600
Total	8,171	13,836	20,000

Data Availability Statement

Some or all data, models, or code generated or used during the study are proprietary or confidential in nature and may only be provided with restrictions.

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