Will smart cities enhance the social capital of residents? The importance of smart neighborhood management

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ABSTRACT

Social capital is a concept that indicates the strength of the relationship among people inside and outside a community. It is a factor that facilitates policy for community formation and regeneration and is also an indicator of the outcome of a policy for improving a community. This study examined the hypothesis that the regional efforts to create smart cities using advanced ICT technologies enhance the social capital of the city and identified the factors that enhance social capital. Urban policy in Japan is shifting from hardware-oriented development to software-oriented area management; the Minato Mirai 21 district in the city of Yokohama is a typical example of area management. The essence of smart transition is to enhance various management functions by using smart social technologies, such as advanced information communication. The attractiveness of smart cities with so-phisticated area management provided by such technologies will likely be high. Thus, this study's results will provide useful implications for better area management in smart cities.

1. Introduction

Social capital, as defined by Robert Putnam (Putnam, 2020), represents the relationship among people in a community. In his book *Bowling Alone*, Putnam demonstrated that social capital decreased despite the prosperity of the United States in the latter half of the 20th century and also considered social capital regeneration techniques. The OECD defines social capital as "networks together with shared norms, values, and understandings that facilitate co-operation within or among groups" and as a real-world network between individuals (OECD, 2007). According to the organization, social capital has three categories: bonds (links to people based on a sense of common identity), bridges (links that stretch beyond a shared sense of identity), and linkages (links to people or groups further up or lower down the social ladder). In Japan, where social disparity is relatively small, the bonding and bridging indicators have primarily received attention by scholars (Shiga University & the Economic and Social Research Institute of Cabinet Office, 2016). They defined that each social capital category is a characteristic of social organizations shown by the combination of three dimensions—"trust," "network," and "norms"—which can enhance social efficiency by encouraging coordinated actions among individuals. They argued that strengthening social capital would revitalize regions with civic

activities. In its 2018 report (the Global Happiness Council, 2018), the Global Happiness Council ordered national happiness according to six conditions (including social capital) in each country and stated that the best practices or international diplomatic initiatives in countries and regions can be implemented by confirming the level of happiness. The Cabinet Office of Japan proposed the happiness index as a performance indicator in formulating a "new growth strategy," which is partially related to social capital (the Commission on Measuring Well-being, Japan, 2011). Thus, social capital has been used as a policy tool for good community management but is also as a performance indicator for verifying the effects of management policy.

The concept of social capital, which Putnam initially proposed to indicate relationships among people in a community, was later formulated as a numerical indicator and used as a performance indicator for the community. In other words, it has been used as an important variable in empirical research in various fields as an indicator of policy implementation effect by local governments or an indicator of people's well-being.

Sustainable development goals (SDGs) are currently internationally recognized as social issues to be addressed and attempt to simultaneously solve multiple important issues. Areas of increasing importance include environmental and energy issues and social issues such as aging.

In Japan, a smart city is officially defined as a city whose regional functions and services have become more efficient and sophisticated through the use of advanced technologies, primarily in information and communication technology (ICT); where various problems have been solved; and where new values, such as comfort and convenience, are created. Promoting the use of renewable energy and optimizing energy management are also major aims of smart city-oriented area management (Smart City Public-Private Partnership Platform, 2020).

Here, our question is, "are regional efforts on smart cities improving social capital?" If the answer is yes, then regional efforts toward smart cities can be expected to increase residents' happiness, because social capital is an indicator for estimating happiness (the Commission on Measuring Well-being, Japan, 2011; the Global Happiness Council, 2018). In this case, social capital is considered a means to smoothly facilitate community management (Shiga University & Economic and Social Research Institute of Cabinet Office, 2016), and regional smart city efforts are expected to continue accelerating.

In the present study, we examined the hypothesis that "regional efforts to create smart cities increase social capital" and identified the factors that improve social capital. For that purpose, we administered a questionnaire to residents of condominiums in Minato Mirai 21 in Yokohama, where area management efforts for smart cities are particularly advanced in Japan, to investigate their social capital indicators. The hypothesis was verified by comparing the survey results of Minato Mirai 21 with those of the control area (i.e., other metropolitan areas).

This paper is structured as follows. In Section 2, previous studies on social capital indicators applied to smart cities and other forms of community development are discussed. Section 3 describes our survey outline, and Section 4 discusses the analytical method. Section 5 provides the survey results. Based on this, Section 6 discusses area management oriented toward a smart city with clear concepts that strengthen the social capital indicators of residents and the use of smart social technology to further reinforce social capital. Finally, Section 7 summarizes the paper.

2. Literature

Albino et al. used an in-depth literature review of relevant studies and official documents from international institutions to prove that the concept of social capital is frequently identified in the definition or dimension of smart cities (Albino, Berardi, & Dangelico, 2015). The relationship between social capital and regional governance is often considered in the field of public health. For example, Santana et al. revealed that obesity is lower in areas with high social capital indicators and among a population that walks more often (Santana, Santos, & Nogueira, 2009) and Zock et al. showed that social cohesion reduces the prevalence of depression (Zock et al., 2018).

Because social capital contributes to health, many researchers have identified community features that enhance social capital. Leyden signals pedestrian-oriented neighborhood design (Leyden, 2003) and Rugel et al. suggests natural space exposure (Rugel, Carpiano, Henderson, & Brauer, 2019). Hanibuchi et al. pointed out that the social capital indicators of a community increase with the age of the city and its proximity to neighboring large cities (Hanibuchi et al., 2012). Previous studies also examined factors that increase social capital in relation to solving other social issues. Savoldi and Ferraz de Abreu stated that the Internet has a positive impact on community social capital and gives hope for the challenge of segregation (Savoldi & Ferraz de Abreu, 2014). Van Brussel and Huyse noted that changing the behavior of people is necessary to improve the atmospheric environment of local transportation (Van Brussel & Huyse, 2019). They suggested that developing a citizen participation project for this purpose would increase the community's social capital, promote behavioral change, and resolve environmental problems. In summary, previous studies consider that changing the behavior of residents by raising their social capital indicators helps solve social problems; they also consider the types of

measures needed to raise social capital.

However, other studies argue that the concept of social capital should be considered in depth before being used to solve social problems. Altschuler et al. separated the concept of bonding and bridging social capital and pointed out that the former is uniform among people with different socio-economic status in a community and the latter varies depending on the status (Altschuler, Somkin, & Adler, 2004). Semenza and Krishnasamy concluded that a health-promoting community design should be developed after analyzing the characteristics and needs of the community based on the concept of bonding and bridging social capital (Semenza & Krishnasamy, 2007). Ebi argued that communities can be made resilient to the health risks resulting from climate change by top-down risk management and bottom-up enhancement of social capital, noting the importance of the latter based on case studies in the United States (Ebi, 2011). Cohen and Schuchter argued that interdisciplinary programs in public health, education, and urban planning have common goals, including social capital, and that further research is needed to coordinate these programs (Cohen & Schuchter, 2013). Ramirez-Rubio et al. introduced an international decision-making tool designed for urban policies that promote public health (Ramirez-Rubio et al., 2019). Although the purpose of the tool is achieving SDGs, it also has other goals such as increasing social capital. Thus, social capital has become an important consideration in urban planning policy.

Social capital consideration has also attracted attention in the planning of smart cities. According to Fortino et al., smart cities are a community of self-interested agents associated with IoT devices. He developed an algorithm that describes the trustworthiness of the relationships of agents and the cooperative environment from social capital to have a practical impact on IoT systems in smart cities (G. Fortino, Fotia, Messina, Rosaci, & Sarné, 2020a). Further, they developed intelligent agents technology to add social behavior to the community of smart objects (G. Fortino, Fotia, Messina, Rosaci, & Sarné, 2020b). Foth et al. focused on the potential impact of digital transformation in smart cities on citizens and citizenship (Foth, Hudson-Smith, & Gifford, 2016). They were interested in social capital (more specifically, civic capital) as an evaluation indicator. Caragliu et al. argued that typical smart city projects aim to apply general technological solutions to satisfy local needs (A. Caragliu, del Bo, & Nijkamp, 2011) and that social capital enhances the spillover effect of advanced technology and has a positive effect on the output of urban innovation by smart cities (A. Caragliu & Del Bo, 2019). Macke et al. argued for the importance of considering social capital in smart city policy, because resident satisfaction in smart cities is enhanced by the sense of community (a concept similar to social capital) (Macke, Rubim Sarate, & de Atayde Moschen, 2019). Bartelt et al. showed that social capital elements might contribute to desirable outcomes for the organization using data collected in a smart city living lab (Bartelt, Urbaczewski, Mueller, & Sarker, 2020). De Guimaraes et al. indicated that social capital related factors, such as collaboration, participation and partnership, and communication, improve the quality of life (QoL) in smart cities and argued that these factors should be utilized for the governance of such cities (De Guimarães, Severo, Felix Júnior, Da Costa, & Salmoria, 2020). Rani et al. argued that social capital is considered a major factor for sustainability, resilience, and good quality of life in smart cities (Rani, Jabar, Abdullah, & Jusoh, 2020). These studies show that social capital can enhance the functions of smart cities and the consideration of social capital in planning smart cities should be promoted.

Lim et al. used a systematic literature review to determine the results of smart city development (Lim, Edelenbos, & Gianoli, 2019). They pointed out that many studies argue that the move to smart cities improves social capital; however, in most cases, it remains an unproven hypothesis. They conclude that additional research is needed to find evidence of these hypothetical impacts in smart cities.

Increased social capital is generally recognized as having a positive effect (for example, health promotion effect) on town planning policy;

studies have been conducted on factors that improve social capital. However, in smart city policy, social capital is recognized as a necessary characteristic of smart cities and smart city governance should consider improving social capital. Little research has been conducted on the relationship between the construction of a smart city and social capital improvement or the factors in the smart city that improve social capital. Lim et al. indicated that few studies have shown that smart cities improve social capital; this study aims to verify this issue and address the hypothesis that efforts to create smart cities increase social capital (Lim et al., 2019). As pointed out by the OECD (2007), social capital is a real-world network between individuals. Therefore, testing the hypothesis that smart cities improve social capital is not different from testing the hypothesis that smart cities strengthen authentic social ties between individuals. Amankwaa and Blay (2018) point out that social media is increasing human vulnerability in cities, and that it is important to consider the people-centered agenda to address this issue. Further, social capital is believed to be an indicator of consideration for the people-centered agenda.

3. Survey

3.1. Outline

The survey was conducted in large-scale condominiums in Minato Mirai 21, Yokohama. To collect a control sample, we conducted another survey using an almost similar questionnaire for the inhabitants of relatively new large condominiums in other metropolitan areas, where smart city-oriented area management had not been carried out. Table 1 shows the survey procedure. In Minato Mirai 21, the survey subjects were residents living in six large condominiums that are members of the Minato Mirai Condominium Association. We asked all the 3010 households living in these condominiums to answer the survey, and 441 gave valid answers: The valid response rate is 14.7%. Four hundred control samples, which are approximately the same size as the sample in Minato Mirai 21, were collected via a web survey.

The actual questions are given in Appendix I. The questions covered the following topics: (1) creating social capital indicators, (2) the current home of respondents, (3) the usage status of the social networking services (SNS) of respondents, (4) the consciousness of respondents regarding community interaction, and (5) the demographic attributes of respondents. We referred to the precedent case of the survey (Shiga University & the Economic and Social Research Institute of the Cabinet Office, 2016) for questions on creating social capital indicators and to

Table 1
Survey overview.

	Minato Mirai 21, Yokohama	Other metropolitan areas
Survey schedule	October 27–November 30, 2019	November 26–29, 2019
Survey target	Residents of 5 condominiums	Men and women aged 20–69 living in large-scale condominiums (300 or more units) within 10 years of construction in the Tokyo metropolitan area (23 wards/city areas of Tokyo, Kawasaki, Saitama, and Yokohama excluding Minato Mirai 21)
Sampling	Those who responded to the survey request leaflet distributed to each home	Samples affiliated with Rakuten Insight, Inc.
Survey method	Internet survey (respondents accessed the URL on the server of the survey contractor.)	Internet survey
Number of collections	441	400
Survey contractor	Rakuten Insight, Inc.	Rakuten Insight, Inc.

the research report (Ministry of Internal Affairs and Communications, 2018) for those on SNS usage status.

SNS usage status was included in the survey for the following reasons. As mentioned earlier, a smart city uses ICT to improve the efficiency of city functions and services. Because SNS is an ICT that is widely used and easy for the general public to understand, we adopted the usage status of SNS. Savoldi and Ferraz de Abreu indicated that the Internet improves relationships between people and strengthens the social capital of the community (Savoldi & Ferraz de Abreu, 2014); therefore, we expected SNS to have a similar effect.

3.2. Minato Mirai 21, Yokohama

This section describes the Minato Mirai 21 district in Yokohama, Japan, that was chosen for this study as a typical example of a smart city. Yokohama is a historic port city located in the Tokyo metropolitan area. Its port was built in the latter half of the 19th century in the present city center, thus dividing the urban space into two. In the latter half of the Japanese economic miracle period (1955–1970), an urban redevelopment plan was developed by relocating the port facilities. The city center reinforcement plan was the starting point for Minato Mirai 21. Although the formulation of this plan began in 1965, the actual construction started only in 1983. From the beginning of the project, urban development with a high level of infrastructure was promoted, including the construction of a shared ditch for water pipes, communication lines, power lines, medium-pressure gas pipes, and district heating and cooling pipes. Under the national "new growth strategy" (2010 cabinet decision), the concept of "environmental future city" was positioned as a national strategic project, and Minato Mirai 21 was selected for this purpose by the Japanese government in 2011. In response to this, Yokohama proceeded with the area management of the district and, consequently, formulated the "Minato Mirai 2050 Project" (City of Yokohama, Japan, 2015). The purpose of the project is to manage the district to reduce its environmental impact, enable sustainable development, and improve the QoL of citizens by promoting the use of ICT. The goal is area management oriented toward creating a smart city.

Minato Mirai 21 was selected as the target area for the "smart community demonstration experiment" conducted by the Ministry of Economy, Trade and Industry (METI) from 2011 to 2015. The results of the experiment are now being used for "promoting low carbonization with comprehensive energy management" as part of the "Minato Mirai 2050 Project". Other goals of the project include the formation of a lush landscape; promotion of tourism, culture, and art; and introduction of next-generation mobility.

4. Analytical method

4.1. How to create social capital indicators

As mentioned in Section 1, the social capital concept has three dimensions (trust, network, and norms) and is classified into two of the three categories mentioned earlier (bonding and bridging). Table 2 shows how the questionnaire items correspond to the three dimensions and two categories of the social capital concept. This study combined the responses to the twelve question items in Table 2 and created twelve types of social capital indicators Ind_k ($0 < Ind_k < 1$) (Table 3) for each individual as follows.

Of the answers to the i-th question Q_i in Table 2, Q1–6 are scored on a four-point Likert scale; Q7 and Q8 on a five-point Likert scale; and Q9, 12, 16, and 21 with Yes/No. Then, the answers were converted into 1 or 0 dummy variables (Res_{Qi}) as follows: For Q1–4, "most people can be trusted" was rated as 1 and other responses as 0. For Q5–8, the answer that selected the Likert scale of the top two stages was rated as 1 and all other cases as 0.

$$Res_{Qi} = 0 \ or \ 1, i = 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 16, 21 \qquad (1)$$

Table 2

Questions for creating social capital indicators (twelve items).

Dimension	Category		Questions
Trust	Br	Q1	Do you generally think that people can be trusted? Or do you think it is good to be careful?
	Bn	Q2	Do you think that the people around you in your area can be trusted? Or do you think it is good to be careful?
	Br	Q3	What about people you meet on a "trip" or in an "unknown land"?
	Br	Q4	Do you think that people can be trusted in the event of a disaster? Or do you think it's better to be careful?
Network	Bn	Q5	How do you interact with your neighbors?
	Bn	Q6	How many neighbors do you have a relationship with?
	Br	Q7	How often do you usually interact with friends and acquaintances (other than at school or at work)?
	Br	Q8	How often do you usually interact with your relatives?
(SNS)	Br	Q9	Do you use SNS (Facebook, Twitter, Instagram, LINE[a], etc.) (even if it is to only passively follow others' profiles)?
Norm	Bn	Q12	Are you currently engaged in community activities (such as residence, neighborhood, women's, elderly, youth, and children's associations)?
	Br	Q16	Are you currently engaged in sports/hobbies/entertainment activities (various sports, arts and cultural activities, lifelong learning, etc.)?
	Br	Q21	Are you currently engaged in volunteer activities, NPOs, and citizen activity (activities for town development, welfare for the elderly and disabled people, parenting, sports instruction, beautification, crime prevention/disaster prevention, environment, international cooperation, etc.)?

Bn: Bonding indicator, Br: Bridging indicator

Q1–6 are scored on a four-point Likert scale, Q7 and Q8 on a five-point Likert scale, and Q9, 12, 16, and 21 with Yes/No.

[a] LINE is a popular SNS in Japan.

Here, Qi is the question number. Next, by combining Res_{Qi} for different questions as shown in Table 3, we defined 12 types of social capital indicators Ind_k ($0 < Ind_k < 1$) considering the combination of three dimensions and two categories of the social capital concept (Eq. (2)).

$$Ind_k = \frac{\sum Res_{Qi}}{N_k}, Q_i \in DEF_k \ (k = 1, \cdots 12) \tag{2}$$

Here, DEF_k indicates the definition items of the indicators in Table 3

Table 4

Respondent background

	Minato Mirai 21, Yokohama	Other metropolitan areas
Male:Female	45:55 [a]	61:39
Average age	*48.3*	46.0
Percentage of high-income earners (with annual income of 12 million JPY or more)	*40.1%*	29.5%
Family with:		
couple only	*33.3%*	22.0%
parents	*7.3%*	6.3%
a college student or graduate	*11.6%*	8.0%
junior and senior high school students	*10.0%*	7.8%
elementary school students	14.1%	19.0%
preschoolers	15.9%	28.5%
Average years of residence in the current home	*8.1 years*	5.2 years
Percentage of people who are satisfied with their current home	*85.0%*	66.5%
Percentage of people who want to continue living in their current home	*83.2%*	69.3%

[a] Larger numbers in Minato Mirai 21 are shown in italics.

and N_k is the number of question items included in the kth social capital indicator and the value in the rightmost column of Table 3.

Ind_1 to Ind_3 are social capital indicators that correspond to each of the three dimensions of the social capital concept (trust, network, and norms), respectively. Ind_4 corresponds to the newly added fourth dimension—an SNS indicator that shows a new relationship that has emerged among people due to technological innovation. Ind_5 to Ind_7 are social capital bonding indicators. They are quantified indicators of relationships within the community that also correspond to trust, network, and norms, respectively. Ind_8 and Ind_9 are social capital indicators that correspond to bonding and bridging, respectively. Ind_{10} extends the range of the "bridging" concept to relationships, including SNS. Ind_{11} integrates the three dimensions and two categories of the social capital concept, and Ind_{12} further expands the concept range of social capital to include relationships between people through SNS.

4.2. An analysis of the factors affecting the improvement of social capital indicators

To confirm the factors that influence the improvement of social capital indicators, a regression analysis was performed using twelve social capital indicators as explained variables. First, the analysis was performed on the entire sample for Minato Mirai 21 and other metropolitan areas. The following factors were used as explanatory variables

Table 3

Definition of the social capital indicator Ind_k.

K	Indicator symbol	Explanation of indicators	Definition items of indicators, DEF_k (Question items included in the k-th social capital indicator)												N_k
1	Ind_1	Trust	Q1	Q2	Q3	Q4									4
2	Ind_2	Network	Q5	Q6	Q7	Q8									4
3	Ind_3	Norm	Q12	Q16	Q21										3
4	Ind_4	SNS	Q9												1
5	Ind_5	Trust (Bn)	Q2												1
6	Ind_6	Network (Bn)	Q5	Q6											2
7	Ind_7	Norm (Bn)	Q12												1
8	Ind_8	Bn	Q2	Q5	Q6	Q12									4
9	Ind_9	Br	Q1	Q3	Q4	Q7	Q8	Q16	Q21						7
10	Ind_{10}	Br & SNS	Q1	Q3	Q4	Q7	Q8	Q9	Q16	Q21					8
11	Ind_{11}	Comprehensive	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q12	Q16	Q21		11
12	Ind_{12}	Comprehensive & SNS	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q12	Q16	Q21	12

Bn: Bonding indicator, Br: Bridging indicator

For Q1–4, "most people can be trusted" was valued as 1 and everything else 0. For Q5–8, the answer that selected the Likert scale of the top two stages was valued as 1 and everything else 0. Thus, the answers to the i-th question Q_i were converted into 1 or 0 dummy variables (Res_{Qi}).

that influence social capital indicators: determinants of the current home choice of respondents, events that respondents would like to communicate on SNS, events that deepened the connections between residents of the community, if the respondents lived in their own home, number of years of residence in the current home, if respondents want to continue living in their current home, and personal attributes (gender, age, family structure, occupation, and number of family members). Next, those who responded that they were using SNS in Minato Mirai 21 and other metropolitan areas were analyzed. Additionally, the following factors were added to the explanatory variables: frequency of SNS use, SNS browsing destination, and events that made respondents happy to use SNS.

Note that social capital indicators of Ind_i $i = 1 \sim 3, 6, 8 \sim 12$ are limited dependent variables that take values between 0 and 1; thus, the tobit model was used. The probit model was applied for the social capital indicators of Ind_i $i = 4, 5, 7$, which are binary variables of 0 and 1.

5. Results

5.1. Descriptive statistics of the responses

Table 4 summarizes the background of respondents living in condominiums in Minato Mirai 21 and other metropolitan areas. The average age was slightly higher in Minato Mirai 21, where the percentage of people with high annual income (more than 12 million JPY) was more than 10 percentage points higher than that in other metropolitan areas. Additionally, in Minato Mirai 21, the average number of years of residence in the current home was higher and the percentage of people who are satisfied with their current homes and want to continue living in those homes were higher. Table 5 shows the determinants of the current home choice of the respondents. The items in the first column are the core concepts in area management in Minato Mirai 21 (City of Yokohama, Japan, 2015). The table shows that these concepts influenced the home choice of residents in this district. For 46.3% of the

Table 5
Determinants of your current home choice (for the percentage of people who answered that it was a determinant)

	Minato Mirai 21, Yokohama	Other metropolitan areas
The Minato Mirai 21 Urban Development Basic Agreement is in operation/ A condominium management system is in operation.[a]	53.1%	68.0%
Earthquake measures are promoted/Joint disaster prevention drills are conducted.	46.0%	46.0%
There are next-generation mobility initiatives using electric vehicles/There is convenient transportation.	23.1%	76.3%
There is a district heating and cooling system/There are measures against global warming.	*46.3%* [b]	18.5%
Efforts are being made to improve the water environment and biodiversity.	*30.6%*	21.5%
Cleaning activities and greening measures are performed well.	*72.6%*	51.0%
Community events are active.	*34.5%*	21.3%
Sightseeing facilities are substantial.	*66.4%*	25.3%
Area management is being promoted by the city of Yokohama/ There is community development support by the local government	*69.8%*	23.0%
Companies are being attracted with cutting edge technology.	*54.6%*	18.3%

[a] If a cell is separated by a slash, the first part is the content of the Minato Mirai 21 district survey, and the latter is that of other metropolitan area surveys.
[b] The numbers in Minato Mirai 21, which are larger than the numbers in other regions, are shown in italics.

Table 6
Percentage of people who are happy to use SNS for the following activities

		Minato Mirai 21, Yokohama	Other metropolitan areas	Difference
Bn	I made close friends and contacts in the community.	*19.6%* [a]	17.5%	2.10%
Br	I made close friends and contacts outside the community.	*17.7%*	11.6%	6.10%
Br	I get the latest news and information about society and economy.	*42.5%*	30.8%	11.70%
Bn	I was able to obtain information that I was interested in, such as hobbies and local topics.	*51.3%*	33.9%	17.40%
Bn	I can deepen ties with family and friends.	*49.2%*	32.9%	16.30%
Br	I can reconnect with people who have not been in contact for a while.	*50.5%*	39.4%	11.10%
Br	I was able to connect with people I had never met before.	*20.7%*	17.5%	3.20%
Bn	I have stronger ties within the community.	10.8%	12.3%	−1.50%

Bn indicates that the content described in row affects the bonding indicator, and Br indicates that the content described in the row affects the bridging indicator.
[a] The numbers in Minato Mirai 21, which are larger than the numbers in other regions, are shown in italics.

respondents in the Minato Mirai 21 survey, the region's advanced energy system (district heating and cooling system) was the determinant of their current home choice.

We investigated the usage of SNS in both districts: 84.4% of people in Minato Mirai 21 and 73.0% in the other metropolitan areas use some type of SNS. SNS users were comparatively more than 10 percentage points higher in Minato Mirai 21. Table 6 shows the percentage of people who were happy to do the activities provided in the first column using SNS. The percentage of people who acquired information regarding their surroundings and strengthened connections with family and friends through SNS was 16–17 percentage points higher in Minato Mirai 21 than in other metropolitan areas. Thus, SNS seems to have helped strengthen familiar exchanges between people in the district more than in other metropolitan areas. Here, it should be noted that in the Minato Mirai 21, many people answered, "I can deepen ties with family and friends through SNS." In other words, in smart cities, SNS is helping to deepen authentic social ties.

Additionally, regarding desired SNS communication, SNS was actively used in Minato Mirai 21 for items that affect social capital bonding indicators, such as exchanging information about community events and hobbies and travel. Thus, SNS was actively used for interaction within the community in the district more than in other metropolitan areas.

5.2. Calculation results of social capital indicators

Tables 7 and 8 show the calculation results of the social capital indicators defined in the previous section.[1] Table 7 compares the indicators by region. Except for the Ind_7 norm (bonding) indicator, the social capital indicators of Minato Mirai 21 are significantly higher than those of other metropolitan areas. In particular, the Ind_2 network indicator and the Ind_6 network (bonding) indicator in the district are higher

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[1] The significance of the difference is based on the nonparametric Wilcoxon rank-sum (Mann-Whitney) test.

Table 7
Social capital indicators from Minato Mirai 21 and other metropolitan areas.

		Minato Mirai 21, Yokohama (441 people)		Other metropolitan areas (400 people)		Significance of difference
		Mean	Std. Dev.	Mean	Std. Dev.	
Ind_1	Trust	0.184[a]	0.274	0.116	0.252	***
Ind_2	Network	0.424	0.271	0.323	0.294	***
Ind_3	Norm	0.311	0.270	0.228	0.296	***
Ind_4	SNS	0.847	0.360	0.743	0.438	***
Ind_5	Trust (Bn)	0.313	0.464	0.150	0.358	***
Ind_6	Network (Bn)	0.381	0.424	0.301	0.416	***
Ind_7	Norm (Bn)	0.150	0.357	0.140	0.347	
Ind_8	Bn	0.306	0.291	0.223	0.285	***
Ind_9	Br	0.275	0.195	0.205	0.202	***
Ind_{10}	Br & SNS	0.346	0.182	0.271	0.193	***
Ind_{11}	Comprehensive	0.287	0.189	0.212	0.204	***
Ind_{12}	Comprehensive & SNS	0.333	0.179	0.255	0.195	***

*** $p < 0.01$.
[a] Italic numbers show that there are significant differences.

than those in other metropolitan areas.[2] For relatively high social capital indicators in the district, the satisfaction level of respondents with their current home was high (Table 4); thus, if the social capital indicator is high, satisfaction is also high.

Table 8 compares the calculation results of the social capital indicators for SNS users and non-users in each district. Accordingly, the social capital indicators that show a wide range of friendships, such as Ind_2 network indicators, Ind_9 bridging indicators, Ind_{10} bridging and SNS indicators, and Ind_{11} comprehensive indicators, are significantly higher for SNS users than for non-users.

In Minato Mirai 21, the social capital indicators in all dimensions and categories were high, which lead to resident satisfaction. Additionally, SNS use strengthens the social capital indicators of the network dimensions and of the bridging category.

5.3. Factors affecting social capital indicators

Appendix Tables 1 and 3 for Minato Mirai 21 and Appendix Tables 2 and 4 for other metropolitan areas show the results of calculating the marginal effects[3] by performing tobit or probit analysis to investigate the factors that influence our social capital indicators. Of these, the results that were significant at the of 1% or 5% level for Minato Mirai 21 are extracted and shown in Tables 9 and 10.

Table 9 shows the marginal effects for all samples in Minato Mirai 21. We focus on the Ind_6 network (bonding) index, which had higher values in the district than in other areas. If the determinants of the current home of the respondents were the promotion of earthquake measures/ joint disaster prevention drills and active community events, the social capital indicator increased by 20–30%. Active district events had a positive effect on the indicators in other bonding and bridging categories. Additionally, this indicator was higher if the respondent believed that a regular dinner party would deepen the connections between the residents of the community, if the respondent lived in their own home, if they had elementary school students, or if they had a large number of family members.

This was compared with the marginal effects of the control area (see Appendix Table 2). The Ind_6 network (bonding) indicator was also higher when the determinants of the current home of the respondent were the promotion of earthquake measures/joint disaster prevention drills, active community events, or that the respondent lived in their own home. However, this differs from the results in Minato Mirai 21, in that family factors did not significantly affect this indicator. In the district, the social capital indicators of network dimension and bonding category increased in the presence of children, whereas in other metropolitan areas, the presence of children affected only the Ind_7 norm (bonding) indicator, which implies participation in some organizations.

Table 10 shows the marginal effects for samples using SNS from all samples in Minato Mirai 21. The Ind_6 network (bonding) indicator increased when respondents used Instagram, especially when they often browsed the Instagram profiles of friends and acquaintances in the community, appreciated that they have made close friends in the community using SNS, and believed that participating in circle activities such as hobbies and sports deepens the connections between the

Table 8
Social capital indicators by SNS user/non-user.

		Minato Mirai 21, Yokohama					Other metropolitan areas				
		SNS users (372 people)		SNS non-users (67 people)		Significance of difference	SNS users (292 people)		SNS non-users (101 people)		Significance of difference
		Mean	Std. Dev.	Mean	Std. Dev.		Mean	Std. Dev.	Mean	Std. Dev.	
Ind_1	Trust	0.187	0.275	0.160	0.264		0.122[a]	0.258	0.104	0.243	***
Ind_2	Network	0.441	0.273	0.331	0.243	***	0.350	0.293	0.253	0.291	***
Ind_3	Norm	0.315	0.270	0.289	0.278		0.250	0.301	0.175	0.281	
Ind_4	SNS	1.000	0.000	0.000	0.000		1.000	0.000	0.000	0.000	
Ind_5	Trust (Bn)	0.317	0.466	0.284	0.454		0.154	0.362	0.149	0.357	
Ind_6	Network (Bn)	0.391	0.423	0.321	0.424		0.318	0.422	0.257	0.398	
Ind_7	Norm (Bn)	0.142	0.350	0.179	0.386		0.147	0.355	0.129	0.337	
Ind_8	Bn	0.310	0.287	0.276	0.299		0.235	0.286	0.198	0.286	***
Ind_9	Br	0.286	0.197	0.217	0.176	***	0.224	0.202	0.157	0.195	***
Ind_{10}	Br & SNS	0.375	0.173	0.190	0.154	***	0.321	0.177	0.137	0.171	***
Ind_{11}	Comprehensive	0.295	0.189	0.239	0.180	**	0.228	0.201	0.172	0.207	***
Ind_{12}	Comprehensive & SNS	0.354	0.173	0.219	0.165	***	0.292	0.185	0.158	0.190	

Bn: Bonding indicator, Br: Bridging indicator
*** $p < 0.01$.
** $p < 0.05$.
[a] Italic numbers show that there are significant differences.

Table 9
Marginal effect of social capital indicators in Minato Mirai 21 (extracted results of $p < 0.05$)

		Ind$_1$	Ind$_2$	Ind$_3$	Ind$_4$	Ind$_5$	Ind$_6$	Ind$_7$	Ind$_8$	Ind$_9$	Ind$_{10}$	Ind$_{11}$	Ind$_{12}$
		Trust	Network (NW)	Norm	SNS	Trust (Bn)	NW (Bn)	Norm (Bn)	Bn	Br	Br & SNS	Comprehensive	Comprehensive & SNS
Determinants of current home choice	Urban Development Basic Agreement				−0.043								
	Earthquake measures/joint disaster prevention drills		0.058				*0.209*			0.028		0.027	
	Next-generation mobility initiatives				0.037								
	Cleaning activities and greening measures							−0.048					
	Active community events		0.044		0.057		*0.294*	0.057	0.067	0.027	0.031	0.033	0.036
	Substantial sightseeing facilities		−0.038		−0.037		−0.213				−0.021		−0.018
What to do on SNS	Consultations for everyday small household chores	−0.079											
	Discussing to go out together				−0.029								
	Help and consultation for childcare and childrearing			0.068									
	Health and illness consultation	−0.143			0.050	−0.068				−0.036	−0.023	−0.034	−0.026
	Consultation for other concerns	*0.161*				0.066				0.036	0.031		0.022
	Information exchange regarding hobbies and travel				−0.089			−0.050			−0.024		−0.023
	A trip to get acquainted with the local history, culture, nature, art, etc.		−0.058										
Events that deepen community ties	Volunteer activities such as cleaning				0.078								
	Planning and holding local events								0.087				
	Events, such as athletic meet and excursions, that can be enjoyed by parents and children				0.074								
	Circle activities, such as hobbies and sports				*0.100*								
	Regular dinner parties		0.050	0.083	−0.063		*0.278*		0.067			0.036	
	Age			0.006	−0.006			0.006					
	Own house dummy						*0.866*						
	The number of years you have lived in your current home		0.007				0.084			0.013			
Family	with junior and senior high school students			*0.197*									
	with elementary school students		*0.136*		−0.133		*0.778*	*0.162*	*0.214*			0.090	
	with preschoolers				−0.172								
Occupation	Self-employed		*0.119*	*0.232*						0.093		0.089	0.075
	Civil servant/teacher	−0.339	*0.110*	*0.163*									
	Unemployed		*0.163*							*0.147*	*0.107*		
	Homemaker		*0.131*										0.060
	Number of family members living together						*0.395*						

The numbers in Minato Mirai 21, which are larger than the numbers in other regions, are shown in italics.

Table 10
Marginal effects of social capital indicators of SNS users in Minato Mirai 21 (extracted results of $p < 0.05$)

		Ind_1 Trust	Ind_2 Network (NW)	Ind_3 Norm	Ind_5 Trust (Bn)	Ind_6 NW (Bn)	Ind_7 Norm (Bn)	Ind_8 Bn	Ind_9 Br	Ind_{10} Br & SNS	Ind_{11} Comprehensive	Ind_{12} Comprehensive & SNS
Frequency of SNS use	LINE	−0.064					−0.040	−0.052				
	Instagram		0.028			*0.199*						
	Other		−0.032									
Determinants of current home choice	Promotion of earthquake measures/joint disaster prevention drills.		0.061		0.061	*0.245*		0.074	0.037	0.026	0.043	0.034
	Cleaning activities and greening measures						−0.062					
	Community events are active		0.038	0.049		*0.272*	0.064	0.058			0.024	0.022
	Sightseeing facilities are substantial		−0.036			−0.201						
Purpose of a Facebook search	Friends and acquaintances in the community				0.134							
Purpose of a Twitter search	Friends for daily interactions			*0.144*		*0.178*						
Purpose of a LINE search	Friends and acquaintances in the community				−0.213							
Purpose of a Instagram search	Friends for daily interactions			0.121								
	Friends and acquaintances in the community	*0.204*	0.107			*0.538*		*0.160*	0.070	0.057	0.087	0.074
Purpose of a other SNS search	Friends for daily interactions				−0.262							
Positive aspect of using SNS	Close friends and contacts in the community		*0.152*			*0.775*					0.059	
	Deepened ties with family and friends			0.125					0.059		0.047	0.038
What to do on SNS	Consultation for everyday small household chores	−0.076										
	Help and consultation for childcare and childrearing			0.091			0.050				0.026	0.022
	Health and illness consultation	−0.183			−0.092				−0.038	−0.031	−0.039	−0.035
	Consultation for other concerns	*0.200*			0.098						0.026	0.022
Events that deepen community ties	A trip to get acquainted with the local history, culture, nature, art, etc.			−0.066								
	Planning and holding local events				0.090		0.092					
	Conducting hobby-related		0.060			*0.306*						

Table 10 (*continued*)

		Ind$_1$	Ind$_2$	Ind$_3$	Ind$_5$	Ind$_6$	Ind$_7$	Ind$_8$	Ind$_9$	Ind$_{10}$	Ind$_{11}$	Ind$_{12}$
		Trust	Network (NW)	Norm	Trust (Bn)	NW (Bn)	Norm (Bn)	Bn	Br	Br & SNS	Comprehensive	Comprehensive & SNS
	and sports lectures by inviting an outside or community instructor											
	Regular dinner parties		0.050	0.068					0.038	0.028	0.034	0.029
	Age			0.005								
	Own house dummy					*0.879*						
	Number of years of residence					0.067						
Family	with parents					−0.896		−0.267				
	with a college student or graduate					−0.876		−0.200				
	with elementary school students		*0.154*									
	Self-employed		*0.162*	0.271*		*0.647*	*0.151*	*0.164*	0.134	0.110	0.123	0.108
Occupation	Civil servant/teacher	−0.426		0.190*								
	Unemployed		*0.148*						0.130	0.107	0.130	0.116
	The number of family members living together					*0.512*		0.102				

The numbers in Minato Mirai 21, which are larger than the numbers in other regions, are shown in italics.

residents of the community. In Minato Mirai 21, SNS was effectively used to foster networks within the community.

This was compared with the marginal effects for the samples using SNS among all samples in other metropolitan areas (see Appendix Table 4). Connections with friends and acquaintances within the community through LINE[4] and Instagram enhanced the *Ind$_6$* network (bonding) indicator. However, unlike the case of the sampled district, in other metropolitan areas, SNS use for daily consultation did not affect any social capital indicators. The feature of Minato Mirai 21—the feeling that "it is good to consult about housework, childcare, concerns, etc., on SNS"—raised the social capital indicators of the trust and norms dimensions. Thus, in the district, the active use of SNS in daily life strengthened the ties between people and improves social capital indicators.

In Minato Mirai 21, the area management concepts for "smart cities," such as disaster prevention drills and active community events, clearly strengthened the social capital indicators of network dimensions among residents. Additionally, in this district, networks expanded through children and families and SNS had a positive effect on fostering networks within the community. Social capital indicators are raised by utilizing SNS in daily life, a characteristic of a city where area management is oriented toward a smart city.

The presence of an advanced energy system (district heating and cooling system) was the determinant of current home choice for about half of the respondents in Minato Mirai 21, but it could not be said to be a factor strengthening the social capital indicators. Van Brussel and Huyse pointed out that strengthening social capital induced behavioral changes facilitate pro-environmental behavior (Van Brussel & Huyse, 2019). In our future research, we will consider whether the strengthening of social capital indicators by area management oriented toward smart cities has the effect of encouraging residents to shift to a more efficient energy system.

6. Discussion

In this study, we examined the hypothesis that "regional efforts to create smart cities increase social capital" and identified the factors that improve social capital. To that end, we conducted a questionnaire survey of condominium residents in the Minato Mirai 21 district in the city of Yokohama—which is conducting area management oriented toward a smart city—and in the control area (other metropolitan areas).

Twelve types of social capital indicators were created by combining the three dimensions (trust, network, and norms) and two categories (bonding and bridging) of the social capital concept. In the survey, we also asked about the SNS usage status of the respondents. A smart city is defined as "A city whose regional functions and services have become more efficient and sophisticated through the use of advanced technologies mainly in information and communication technology (ICT) (Smart City Public-Private Partnership Platform, 2020)." Therefore, we considered SNS as the latest ICT technology that is most familiar and easy for residents to understand and investigated the relationship between the usage status and social capital indicators.

The social capital indicators of Minato Mirai 21 were significantly higher than those of the control area, as were the satisfaction level of the residents. Therefore, it is appropriate to set the improvement of social capital indicators as the area management goal.

The social capital indicators of SNS users were significantly higher than those of non-users, primarily those in the bridging category. In Minato Mirai 21, the percentage of respondents using SNS was higher than in the control area, and a larger percentage of respondents used SNS to collect familiar information and to interact with familiar people. Furthermore, in the district, people who want to use SNS for "consultation for everyday small household chores," "health and illness consultation," "information exchange about community events," and "information exchange regarding hobby and travel" were 45.3%, 53.6%, 68.0%, and 75.0%, respectively. These proportions in the control area were 37.3%, 41.1%, 15.5%, and 54.1%, respectively; thus, the values are much higher in Minato Mirai 21 than in the control area. This suggests, in the district, that more respondents use SNS to improve their daily life, and that SNS is helping to deepen authentic social ties in the district.

Promotion of earthquake measures/joint disaster prevention drills and active community events affected the expansion of social capital indicators in the bonding category and network dimensions in Minato Mirai 21 and the control area but had a positive effect on social capital

[4] LINE is a popular SNS in Japan.

indicators in the bridging category only in the former district. These activities are intended area management concepts in the district, determinants of the current home choice of residents, and factors that raised the social capital indicators. In Minato Mirai 21, family structure (especially having elementary school children) had a positive effect on the social capital indicators of the bonding category. No such family-based effects were identified in the control area.

Looking at SNS users, in both regions, communicating with people in the community via SNS helped expand the bonding network. In Minato Mirai 21, SNS was more actively used for daily information exchange between residents than in the control area. Therefore, in the district, the social capital indicators of respondents who used SNS tended to increase in all dimensions and categories. SNS is a general ICT technology, not limited to a specific use in the district. However, these technologies are effectively utilized in area management aimed at creating smart cities, to improve the social capital indicators of a wide range of concepts, and to ultimately produce resident satisfaction in the district.

Fig. 1 outlines our analytical results. Based on a clear concept, the local government is approaching the improvement of social capital indicators and residents' satisfaction level in the area by implementing area management oriented toward smart cities. In Fig. 1, the arrow labeled "Top-down" shows this approach. In particular, disaster prevention measures inspired by the Great East Japan Earthquake are at the core of such a top-down concept. Recently, due to the occurrence of catastrophic disasters caused by global warming, citizens' awareness of disaster prevention is increasing, and disaster prevention measures, as a top-down concept in smart cities, will attract increased attention. Additionally, the use of renewable energy is often added to the action items in area management to increase resilience in the event of a disaster. Needless to say, the use of renewable energy is also beneficial for mitigating global warming (Smart City Public-Private Partnership Platform, 2020). The more recent COVID-19 pandemic will add infectious disease control to the area management concept in addition to disaster prevention measures.

Conversely, smart city residents (smart residents) are approaching the improvement of social capital and satisfaction by using SNS in their daily lives. The existence of the family further promotes the effect. In Fig. 1, the arrow labeled "Bottom-up" shows this approach. SNS is a general-purpose ICT that is also used outside of smart cities, but the "how to use the technology" by smart residents seemingly enhances the effect of the bottom-up approach. In recent infectious disease pandemics, SNS has become more important to compensate for forced social distance. Therefore, differences in how the technology is used will increasingly affect differences in social capital indicators.

As indicated by the prior literature (Shiga University & the Economic and Social Research Institute of Cabinet Office, 2016), improvement of social capital indicators will further enhance local government policy

implementation through strengthening cooperation among residents. The literature cites NGOs as a form of cooperation among residents. The improvement of the social capital indicators feeds back to the top-down and bottom-up approaches in Fig. 1 and further enhances these effects.

Using London as an example, Foth et al. showed best practices combining top-down and bottom-up approaches in smart cities, arguing that digital transformation makes it possible (Foth et al., 2016). They also showed the role of smart citizens in causing civic innovations using new technology. Our analytical results empirically demonstrate the scheme conceptually described by Foth et al.

Fig. 1 shows that top-down and bottom-up approaches should be parallel in smart city-oriented area management procedures. It should be noted that social capital indicators are used as common ratings for both approaches. If the two approaches are effectively combined through the common evaluation indicator, smart city-oriented area management will succeed, and residents' satisfaction will improve.

7. Conclusion

In this study, we focused on Minato Mirai 21, Yokohama, a typical area in Japan that implements area management oriented toward smart cities. We then tested the hypothesis that "regional efforts to create smart cities increase social capital." We conducted a survey with similar questionnaires for Minato Mirai 21 and the control area. Based on the survey results, social capital indicators that combine the three dimensions (trust, network, and norms) and the two categories (bonds and bridges) of the social capital concept were created and compared for both regions. Results showed that residents were highly satisfied in Minato Mirai 21, where area management was oriented toward smart cities. Additionally, the concept of area management was a determinant of the current home choice of the respondents and improved the social capital indicators for a wide range of concepts. Furthermore, in smart cities, advanced ICT technologies, such as SNS, are widely used to strengthen the communication between residents and to assist in their daily lives. In other words, in smart cities, SNS is helping to deepen authentic social ties. We confirmed that the social capital indicators of residents using advanced technology are higher than the social capital indicators of those who do not. In summary, the hypothesis that smart city-oriented area management improves regional social capital indicators is supported, and advanced ICT strengthens the effect of the hypothesis.

Finally, we conclude that smart city-oriented area management should be promoted by arranging a top-down and bottom-up approach using social capital indicators that are common ratings for both approaches. Here, the top-down approach means that local governments should implement smart city-oriented area management under a clear concept, and a bottom-up approach means that smart residents can use SNS in their authentic lives.

There are three limitations in this study: First, since this study is based on a questionnaire survey of residents in the Minato Mirai 21 district of Yokohama, Japan, it is necessary to confirm that similar results can be obtained in other smart cities in Japan and worldwide. Second, this research focused on SNS as the most general-purpose ICT. However, now various ICTs are being adopted in the daily lives of people living in cities, as well as urban infrastructure, such as energy and mobility. It is necessary to expand research on the interrelationship between the penetration of various smart technologies to citizens, smart city-oriented area management, and social capital indicators. Third, this research does not fully consider the benefits of promoting renewable energy use. As the survey results show, improving local resilience and preventing global warming are matters of deep concern for smart city residents. We need to consider the position of the renewable energy utilization promotion policy in Fig. 1. We will work on these limitations in future research.
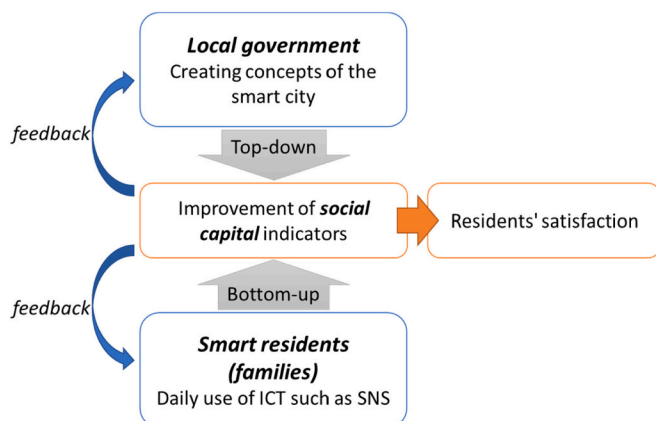
Fig. 1. Outline of analytical conclusions.

CRediT authorship contribution statement

Human subject approval statement

This study was approved by the Ethics Review Committee on Research with Human Subjects of Waseda University (Application No. 2019-204 and No.2019-205).

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix I. Survey items in Minato Mirai 21, Yokohama

★ Questions for creating social capital indicators
(Trust)
Q1 Do you generally think that people can be trusted? Or do you think it is good to be careful?
Q2 Do you think that the people around you in your area can be trusted? Or do you think it is good to be careful?
Q3 What about people you meet on a "trip" or in an "unknown land"?
Q4 Do you think that people can be trusted in the event of a disaster? Or do you think it is better to be careful?
(Network)
Q5 How do you interact with your neighbors?
Q6 How many neighbors do you maintain a relationship with?
Q7 How often do you usually interact with friends and acquaintances (other than at school or at work)?
Q8 How often do you usually interact with your relatives?
(SNS in the network)
Q9 Do you use SNS (Facebook, Twitter, Instagram, LINE, etc.) (even if it is to only passively follow others' profiles)?
Q10 How often do you use your preferred SNS?
Q11 How many "friends" and "follows" do you have on the SNS that you use?
(Norm)
Q12 Are you currently engaging in community activities (such as residence, neighborhood, women's, elderly, youth, and children's associations)?
Q13 For those who are involved in community activities, how often do you currently participate in community activities?
Q14 For those who are involved in community activities, what triggered you to participate in community activities?
Q15 For those who are not involved in community activities, do you want to participate in community activities in the future?
Q16 Are you currently engaged in sports/hobbies/entertainment activities (various sports, arts and cultural activities, lifelong learning, etc.)?
Q17 For those who are engaged in sports, hobbies, and entertainment activities, how often do you currently participate in such activities?
Q18 For those who are engaged in sports, hobbies, and entertainment activities, are your sports, hobbies, and entertainment activities within the "region" in which you live or in another "region"?
Q19 For those who are engaged in sports, hobbies, and entertainment activities, what triggered you to participate in such activities?
Q20 For those who are not engaged in sports/hobbies/entertainment activities, do you want to participate in such activities in the future?
Q21 Are you currently engaged in volunteer activities, NPOs, and citizenship (activities for town development, welfare for the elderly and disabled people, parenting, sports instruction, beautification, crime prevention/disaster prevention, environment, international cooperation, etc.)?
Q22 For those who are engaged in volunteer activities, NPOs, and citizen activities, how often do you currently participate in such activities?
Q23 For those who are engaged in volunteer activities, NPOs, and citizen activities, are the these activities within the "region" in which you live or in another "region"?
Q24 For those who are engaged in volunteer activities, NPOs, and citizen activities, what triggered you to participate in such activities?
Q25 For those who are not engaged in volunteer activities, NPOs, and citizen activities, do you want to participate in such activities in the future?
★ Questions about the current home of the respondents
Q26 Are you satisfied with your current life?
Q27 Are the following determinants of your current home choice?
1. The Minato Mirai 21 Urban Development Basic Agreement is in operation.
2. Earthquake measures are promoted/Joint disaster prevention drills are conducted.
3. There are next-generation mobility initiatives using electric vehicles.
4. There is an environment-friendly district heating and cooling system.
5. Efforts are being made to improve the water environment and biodiversity.
6. Cleaning activities and greening measures are well done.
7. Community events are active.
8. Sightseeing facilities are substantial.

9. Area management is being promoted by the city of Yokohama.

10. Companies are being attracted with cutting edge technology.

★ Questions about using SNS

Q28 Who do you search for on SNS (Facebook, Twitter, Instagram, LINE)?

Q29 How has using SNS been helpful for you? (You may choose multiple options.)

1. I made close friends and contacts in the community.

2. I made close friends and found counselors outside the community, such as for schools for children and workplaces.

3. I get the latest news and information about society and economy.

4. I was able to obtain information that I was interested in, such as hobbies and local topics.

5. I can deepen ties with family and friends.

6. I can reconnect with people who have not been in contact for a while.

7. I was able to connect with people I had never met before.

8. I have stronger ties within the community.

9. Other

10. I haven't found anything good.

Q30 Do you think it would be good to communicate with people for the following via SNS or face-to-face?

1. Consultation for everyday small household chores

2. Discussion to go out together

3. Help with everyday shopping

4. Help and consultation for family assistance and care

5. Help and consultation for childcare and childrearing

6. Health and illness consultation

7. Consultation for other concerns

8. Information exchange about community events

9. Information exchange regarding hobbies and travel

10. Work consultation and information exchange

★ Questions about consciousness of how to interact in a community

Q31 Do you think that the following will deepen the connections between the residents of the community?

1. A trip to get acquainted with the local history, culture, nature, art, etc.

2. Volunteer activities, such as cleaning

3. Planning and holding local events such as the autumn festival

4. Events such as athletic meets and excursions that can be enjoyed by parents and children

5. Building a salon where people can gather at any time

6. Inviting an instructor from outside or inside the community to study useful subjects

7. Conducting hobby-related and sports lectures by inviting outside or community instructors

8. Circular activities such as hobbies and sports

9. Preparation for disaster prevention and emergencies, training, etc.

10. Regular dinner parties

★ Questions about the demographics of respondents

Q32 What is your gender?

Q33 What is your age?

Q34 Please describe your occupation.

Q35 Please describe your type of residence.

Q36 How many years have you lived in your current home?

Q37 Do you want to continue living in your current area in the future?

Q38 Are you married?

Q39 How many family members currently live with you?

Q40 How many of your family members live together or separately (if you have them).

Q41 What is your final educational background?

Q42 What was your income (including bonus, including tax) for the last year, with the whole family living together?

Appendix Table 1

Marginal effects of social capital indicators (Minato Mirai 21).

*A description of the variable symbols is provided in Appendix Table 5.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ind1	ind2	ind3	ind4	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
Q271	0.00870	-0.0199	-0.0289	-0.0433**	0.00717	-0.0722	-0.0198	-0.0130	-0.0160	-0.0187*	-0.0138	-0.0163
	(0.0395)	(0.0160)	(0.0222)	(0.0174)	(0.0251)	(0.0970)	(0.0206)	(0.0240)	(0.0132)	(0.0108)	(0.0114)	(0.00995)
Q272	0.00617	0.0581***	0.0247	-0.0261*	0.0240	0.209**	-0.0255	0.0400	0.0278**	0.0157	0.0272**	0.0184*
	(0.0359)	(0.0180)	(0.0242)	(0.0158)	(0.0250)	(0.0991)	(0.0218)	(0.0263)	(0.0137)	(0.0113)	(0.0120)	(0.0105)
Q273	-0.0494	0.00885	0.00346	0.0372**	-0.0313	0.0860	0.0156	0.00368	-0.00643	-0.00161	-0.00437	-0.000768
	(0.0412)	(0.0169)	(0.0217)	(0.0176)	(0.0263)	(0.105)	(0.0211)	(0.0253)	(0.0124)	(0.0105)	(0.0110)	(0.00987)
Q274	-0.0236	-0.0261	-0.00437	0.0160	-0.0293	-0.110	-0.00308	-0.0319	-0.00431	-0.000756	-0.00997	-0.00747
	(0.0409)	(0.0173)	(0.0225)	(0.0193)	(0.0279)	(0.107)	(0.0195)	(0.0266)	(0.0121)	(0.00992)	(0.0111)	(0.00971)
Q275	0.0314	-0.0182	-0.0111	-0.0214	0.0312	-0.00453	0.0379	0.0291	-0.00787	-0.00585	4.02e-05	0.00129

Appendix Table 1 (*continued*)

Variables	(1) ind1	(2) ind2	(3) ind3	(4) ind4	(5) ind5	(6) ind6	(7) ind7	(8) ind8	(9) ind9	(10) ind10	(11) ind11	(12) ind12
	(0.0450)	(0.0194)	(0.0222)	(0.0231)	(0.0304)	(0.116)	(0.0230)	(0.0284)	(0.0135)	(0.0118)	(0.0123)	(0.0111)
Q276	0.0557	-0.0104	-0.0138	-0.00236	0.0456*	-0.0474	-0.0486**	-0.0146	-0.00522	-0.00473	-0.00475	-0.00472
	(0.0463)	(0.0187)	(0.0229)	(0.0184)	(0.0273)	(0.102)	(0.0198)	(0.0247)	(0.0134)	(0.0108)	(0.0111)	(0.00989)
Q277	0.0384	0.0441***	0.0412*	0.0571***	0.00423	0.294***	0.0569***	0.0674***	0.0273**	0.0312***	0.0331***	0.0364***
	(0.0415)	(0.0162)	(0.0222)	(0.0156)	(0.0259)	(0.103)	(0.0214)	(0.0260)	(0.0123)	(0.00995)	(0.0113)	(0.00986)
Q278	-0.0239	-0.0385**	-0.0242	-0.0377**	0.0131	-0.213**	0.0142	-0.0251	-0.0187	-0.0212**	-0.0176*	-0.0188**
	(0.0398)	(0.0158)	(0.0202)	(0.0152)	(0.0245)	(0.0915)	(0.0184)	(0.0237)	(0.0127)	(0.0102)	(0.0105)	(0.00929)
Q279	-0.0536	0.0210	0.0163	0.0147	-0.0141	0.0376	-0.0232	-0.00907	-0.00785	-0.00567	-0.00556	-0.00488
	(0.0475)	(0.0166)	(0.0212)	(0.0174)	(0.0260)	(0.0978)	(0.0215)	(0.0261)	(0.0138)	(0.0113)	(0.0122)	(0.0106)
Q2710	0.0370	0.00949	-0.00630	-0.00103	0.00913	-0.0786	-0.0106	-0.00448	0.0178	0.0145	0.00739	0.00603
	(0.0429)	(0.0159)	(0.0209)	(0.0152)	(0.0258)	(0.0976)	(0.0214)	(0.0247)	(0.0135)	(0.0103)	(0.0113)	(0.00958)
Q301	-0.0797**	0.00879	0.0235	-0.0227	-0.0247	-0.0313	-0.0212	-0.0184	-0.00644	-0.00888	-0.00901	-0.00895
	(0.0380)	(0.0161)	(0.0231)	(0.0153)	(0.0257)	(0.0942)	(0.0195)	(0.0244)	(0.0135)	(0.0108)	(0.0112)	(0.00980)
Q302	0.0128	-0.00570	0.00682	-0.0296**	0.00962	-0.0145	0.00347	0.00457	0.00306	0.000515	0.00233	-0.000249
	(0.0357)	(0.0146)	(0.0190)	(0.0142)	(0.0218)	(0.0835)	(0.0185)	(0.0220)	(0.0112)	(0.00899)	(0.00968)	(0.00852)
Q303	-0.00279	-0.0237	-0.00908	-0.00900	0.00109	-0.0333	0.00742	-0.00480	-0.00994	-0.0106	-0.00865	-0.00793
	(0.0367)	(0.0160)	(0.0224)	(0.0158)	(0.0247)	(0.0882)	(0.0197)	(0.0240)	(0.0121)	(0.00973)	(0.0106)	(0.00927)
Q304	0.0445	0.0183	-0.0187	0.0167	0.0413	0.0449	-0.00229	0.0138	0.000716	0.00214	0.00771	0.00724
	(0.0454)	(0.0184)	(0.0282)	(0.0206)	(0.0306)	(0.112)	(0.0239)	(0.0322)	(0.0147)	(0.0126)	(0.0139)	(0.0125)
Q305	0.0289	0.0206	0.0676***	0.0165	0.0157	0.0631	0.0116	0.0195	0.0196	0.0182*	0.0167	0.0151
	(0.0433)	(0.0186)	(0.0256)	(0.0184)	(0.0281)	(0.0969)	(0.0207)	(0.0259)	(0.0137)	(0.0109)	(0.0118)	(0.00988)
Q306	-0.143***	-0.0228	-0.0501*	0.0495**	-0.0688**	-0.0413	-0.0151	-0.0329	-0.0361**	-0.0232*	-0.0343**	-0.0261**
	(0.0513)	(0.0222)	(0.0304)	(0.0225)	(0.0333)	(0.124)	(0.0250)	(0.0333)	(0.0166)	(0.0136)	(0.0144)	(0.0124)
Q307	0.161***	-0.00872	-0.000720	0.0319	0.0657**	-0.151	0.0193	0.0107	0.0357**	0.0314**	0.0242*	0.0224**
	(0.0500)	(0.0190)	(0.0267)	(0.0200)	(0.0304)	(0.115)	(0.0233)	(0.0274)	(0.0149)	(0.0123)	(0.0125)	(0.0109)
Q308	-0.0100	-0.0153	-0.00504	0.0304*	0.00640	-0.0415	0.0271	0.00250	-0.00627	-0.00158	-0.00295	0.000666
	(0.0400)	(0.0163)	(0.0204)	(0.0160)	(0.0250)	(0.0982)	(0.0193)	(0.0246)	(0.0124)	(0.0101)	(0.0112)	(0.00981)
Q309	-0.0147	-0.0133	-0.0326	-0.0894***	-0.00421	-0.0245	-0.0501**	-0.0193	-0.0154	-0.0247**	-0.0166	-0.0237**
	(0.0431)	(0.0171)	(0.0238)	(0.0183)	(0.0271)	(0.103)	(0.0209)	(0.0269)	(0.0132)	(0.0110)	(0.0123)	(0.0109)
Q3010	0.00878	0.00376	0.0148	0.00761	-0.0234	0.0936	0.0367*	0.0144	0.00558	0.00737	0.00796	0.00986
	(0.0422)	(0.0165)	(0.0213)	(0.0168)	(0.0255)	(0.0935)	(0.0194)	(0.0252)	(0.0126)	(0.0104)	(0.0110)	(0.00976)
Q311	0.0477	-0.0586**	-0.0481	-0.0190	0.0587	-0.281*	-0.00268	-0.0362	-0.0217	-0.0155	-0.0176	-0.0167
	(0.0612)	(0.0262)	(0.0329)	(0.0254)	(0.0393)	(0.152)	(0.0293)	(0.0374)	(0.0190)	(0.0157)	(0.0167)	(0.0149)
Q312	0.0925	-0.0273	-0.0169	0.0779***	0.0504	-0.185	0.0281	0.00348	0.0210	0.0252	0.0114	0.0171
	(0.0670)	(0.0301)	(0.0403)	(0.0275)	(0.0417)	(0.162)	(0.0318)	(0.0411)	(0.0210)	(0.0178)	(0.0188)	(0.0167)
Q313	0.107	-0.0107	0.0315	-0.0504*	0.0745*	0.185	0.0225	0.0869**	-0.000579	-0.00605	0.0136	0.00818
	(0.0735)	(0.0288)	(0.0436)	(0.0304)	(0.0434)	(0.175)	(0.0335)	(0.0437)	(0.0238)	(0.0204)	(0.0202)	(0.0181)
Q314	0.0371	-0.0201	0.0123	0.0735***	0.0153	-0.0804	0.0241	-0.00238	0.000859	0.00995	-0.00103	0.00665
	(0.0613)	(0.0256)	(0.0320)	(0.0245)	(0.0386)	(0.149)	(0.0251)	(0.0341)	(0.0199)	(0.0163)	(0.0169)	(0.0146)
Q315	-0.0518	0.00517	-0.0174	-0.0237	-0.0112	0.0388	0.0532	0.0223	-0.0109	-0.00558	0.000440	0.00149
	(0.0529)	(0.0244)	(0.0363)	(0.0261)	(0.0366)	(0.148)	(0.0324)	(0.0398)	(0.0181)	(0.0150)	(0.0164)	(0.0144)
Q316	-0.0804	0.0378	-0.0310	-0.0136	-0.0845*	0.105	-0.0422	-0.0287	0.00376	0.00378	-0.00112	-0.00267
	(0.0758)	(0.0354)	(0.0494)	(0.0382)	(0.0502)	(0.201)	(0.0367)	(0.0537)	(0.0257)	(0.0219)	(0.0239)	(0.0212)
Q317	0.0663	0.0107	0.0912*	0.100**	0.0263	0.218	0.0200	0.0526	0.0180	0.0198	0.0202	0.0223
	(0.0886)	(0.0399)	(0.0528)	(0.0404)	(0.0574)	(0.224)	(0.0422)	(0.0579)	(0.0289)	(0.0248)	(0.0271)	(0.0242)
Q318	-0.112	0.0256	0.00205	-0.0237	-0.0676	-0.121	-0.0234	-0.0552	-0.00200	-0.00204	-0.0133	-0.0119
	(0.0693)	(0.0300)	(0.0381)	(0.0312)	(0.0449)	(0.174)	(0.0349)	(0.0444)	(0.0211)	(0.0177)	(0.0195)	(0.0171)
Q319	0.0250	0.0265	-0.00831	-0.0243	0.00778	0.0463	-0.0278	0.0109	0.00976	0.00315	0.00989	0.00480
	(0.0564)	(0.0261)	(0.0342)	(0.0288)	(0.0369)	(0.140)	(0.0305)	(0.0350)	(0.0187)	(0.0162)	(0.0150)	(0.0138)
Q3110	0.0614	0.0498**	0.0828***	-0.0631***	0.0532*	0.278**	0.00481	0.0673**	0.0308*	0.0110	0.0359**	0.0240*
	(0.0482)	(0.0237)	(0.0295)	(0.0228)	(0.0307)	(0.126)	(0.0237)	(0.0302)	(0.0164)	(0.0135)	(0.0143)	(0.0129)
Q32	-0.0573	0.00809	-0.0530	0.00988	-0.00418	-0.112	0.00153	-0.0144	0.0171	0.0102	0.00344	0.00182
	(0.0811)	(0.0380)	(0.0478)	(0.0354)	(0.0548)	(0.212)	(0.0405)	(0.0527)	(0.0255)	(0.0214)	(0.0231)	(0.0206)
Q331	3.77e-05	0.000318	0.00555**	-0.00620***	0.00217	0.00116	0.00643***	0.00374	0.000766	-0.000436	0.00118	0.000507
	(0.00449)	(0.00191)	(0.00242)	(0.00172)	(0.00269)	(0.0111)	(0.00216)	(0.00275)	(0.00142)	(0.00121)	(0.00127)	(0.00113)
Q35	0.0443	0.0364	-0.121	0.0543	0.00232	0.866**	0.141*	0.132	-0.0154	-0.00605	0.0162	0.0220
	(0.155)	(0.0669)	(0.0749)	(0.0665)	(0.0926)	(0.400)	(0.0770)	(0.0924)	(0.0513)	(0.0427)	(0.0417)	(0.0374)
Q361	-0.00767	0.00724**	0.00764	0.00682*	-0.00475	0.0849***	0.00155	0.0134**	-0.00129	-0.000348	0.00261	0.00266
	(0.00969)	(0.00363)	(0.00550)	(0.00377)	(0.00598)	(0.0227)	(0.00430)	(0.00561)	(0.00297)	(0.00248)	(0.00263)	(0.00233)
Q37	-0.0514	0.0306	0.0297	0.0321	-0.0693	0.272	-0.000795	0.0132	0.00600	0.0105	0.0141	0.0149
	(0.111)	(0.0458)	(0.0634)	(0.0434)	(0.0662)	(0.240)	(0.0481)	(0.0635)	(0.0364)	(0.0304)	(0.0310)	(0.0271)
Q38	0.325*	-0.134*	-0.0388	0.134*	0.178*	-0.0924	-0.0173	0.0386	-0.0228	0.00139	-0.00701	0.00571
	(0.171)	(0.0714)	(0.0876)	(0.0735)	(0.105)	(0.372)	(0.0758)	(0.106)	(0.0531)	(0.0441)	(0.0501)	(0.0435)
family1	-0.136	0.0679	-0.0267	-0.0439	-0.0748	-0.185	-0.00484	-0.0404	0.0278	0.0151	0.00272	-0.00229
	(0.128)	(0.0481)	(0.0655)	(0.0550)	(0.0772)	(0.267)	(0.0583)	(0.0811)	(0.0403)	(0.0339)	(0.0364)	(0.0328)
family2	-0.00645	-0.114	0.0969	-0.0166	-0.0502	-0.896*	0.0668	-0.201*	-0.00534	-0.0184	-0.0464	-0.0455
	(0.199)	(0.0869)	(0.102)	(0.101)	(0.122)	(0.479)	(0.0947)	(0.122)	(0.0573)	(0.0472)	(0.0532)	(0.0447)
family3	0.0435	-0.0324	0.0898	-0.0572	-0.0886	-0.556	0.0633	-0.0864	0.0586	0.0386	0.00404	-0.00127
	(0.160)	(0.0640)	(0.0945)	(0.0632)	(0.101)	(0.364)	(0.0837)	(0.0895)	(0.0527)	(0.0441)	(0.0422)	(0.0378)
family4	-0.0996	0.112*	0.197**	-0.0312	-0.0453	-0.0478	0.0903	-0.00212	0.0731	0.0454	0.0377	0.0289
	(0.146)	(0.0649)	(0.0983)	(0.0778)	(0.105)	(0.377)	(0.0831)	(0.0929)	(0.0498)	(0.0422)	(0.0413)	(0.0373)
family5	0.0472	0.136**	0.144	-0.133**	0.0570	0.778**	0.162**	0.214***	0.0530	0.0174	0.0901**	0.0628*
	(0.132)	(0.0594)	(0.0896)	(0.0562)	(0.0874)	(0.334)	(0.0756)	(0.0796)	(0.0435)	(0.0364)	(0.0365)	(0.0324)
family6	-0.0928	0.0924	0.0275	-0.172***	-0.00566	0.246	0.0715	0.0858	0.0417	0.00274	0.0378	0.0136

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Appendix Table 1 (*continued*)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ind1	ind2	ind3	ind4	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
	(0.143)	(0.0661)	(0.108)	(0.0628)	(0.0984)	(0.356)	(0.0841)	(0.0933)	(0.0466)	(0.0396)	(0.0409)	(0.0370)
emp1	0.152	0.119**	0.232***	-0.000398	-0.0258	0.480	0.106*	0.122	0.0927**	0.0721*	0.0890**	0.0754**
	(0.135)	(0.0512)	(0.0792)	(0.0559)	(0.0834)	(0.296)	(0.0574)	(0.0772)	(0.0457)	(0.0402)	(0.0383)	(0.0356)
emp2	-0.339**	0.110**	0.163**	-0.000104	-0.142	0.344	0.0210	-0.0114	0.0135	0.0114	0.00699	0.00924
	(0.137)	(0.0538)	(0.0670)	(0.0682)	(0.0945)	(0.324)	(0.0661)	(0.0882)	(0.0322)	(0.0246)	(0.0332)	(0.0274)
emp3	0.192	0.0565	0.0390	0.0629	0.0809	0.135	-0.00234	0.0715	0.0596	0.0539	0.0502	0.0501*
	(0.144)	(0.0497)	(0.0689)	(0.0628)	(0.0846)	(0.285)	(0.0654)	(0.0743)	(0.0411)	(0.0355)	(0.0336)	(0.0303)
emp4	0.437*	0.107	-0.172	-0.130	0.259	0.599		0.190	0.0917	0.0532	0.0919	0.0655
	(0.265)	(0.121)	(0.157)	(0.138)	(0.190)	(0.587)		(0.180)	(0.0896)	(0.0804)	(0.0804)	(0.0736)
emp5	0.232	0.163***	0.166	-0.0312	-0.0107	0.295	-0.0360	0.00329	0.147***	0.107**	0.0961*	0.0753
	(0.202)	(0.0622)	(0.102)	(0.0637)	(0.116)	(0.400)	(0.0755)	(0.122)	(0.0525)	(0.0469)	(0.0502)	(0.0476)
emp6	0.0394	0.131**	0.113	0.0633	-0.0456	0.547*	0.0394	0.0727	0.0579	0.0596*	0.0597*	0.0596**
	(0.118)	(0.0562)	(0.0749)	(0.0590)	(0.0779)	(0.300)	(0.0599)	(0.0736)	(0.0385)	(0.0323)	(0.0335)	(0.0303)
num	-0.0792	0.0416	-0.0729	-0.00994	-0.0127	0.395**	-0.0234	0.0563	-0.0304	-0.0219	-0.00135	-0.000104
	(0.0758)	(0.0366)	(0.0501)	(0.0337)	(0.0511)	(0.196)	(0.0441)	(0.0481)	(0.0263)	(0.0213)	(0.0228)	(0.0200)
inc	0.000232	3.17e-05	-3.30e-05	7.67e-05	0.000122	-0.000126	-7.82e-05	-2.86e-06	5.30e-05	5.19e-05	2.34e-05	3.11e-05
	(0.000159)	(6.65e-05)	(9.71e-05)	(5.94e-05)	(9.72e-05)	(0.000355)	(7.29e-05)	(0.000100)	(5.22e-05)	(4.41e-05)	(4.64e-05)	(4.20e-05)
Observations	408	408	408	406	408	408	401	408	408	408	408	408

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix Table 2
Marginal effects of social capital indicators (other metropolitan areas).
*A description of the variable symbols is provided in Appendix Table 5.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ind1	ind2	ind3	ind4	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
Q271	−0.0563	0.0640**	0.133***	0.0540**	0.0194	0.192	0.0444*	0.0576	0.0263	0.0261**	0.0324**	0.0309***
	(0.0771)	(0.0260)	(0.0466)	(0.0269)	(0.0262)	(0.153)	(0.0228)	(0.0384)	(0.0172)	(0.0122)	(0.0150)	(0.0112)
Q272	0.0206	0.0442	0.0288	−0.0324	−0.0341	0.410**	0.0213	0.0806*	0.0196	0.0137	0.0235	0.0173
	(0.0725)	(0.0283)	(0.0436)	(0.0251)	(0.0240)	(0.173)	(0.0200)	(0.0431)	(0.0182)	(0.0135)	(0.0161)	(0.0125)
Q273	−0.0968	−0.0331	−0.0735*	0.0218	0.00193	−0.0697	−0.0416*	−0.0145	−0.0314*	−0.0209	−0.0202	−0.0145
	(0.0728)	(0.0264)	(0.0398)	(0.0239)	(0.0227)	(0.151)	(0.0196)	(0.0384)	(0.0173)	(0.0133)	(0.0156)	(0.0125)
Q274	0.0179	−0.0331	−0.110*	−0.0250	0.0169	0.107	−0.00206	0.0393	−0.00966	−0.00836	−0.00412	−0.00396
	(0.0984)	(0.0423)	(0.0631)	(0.0337)	(0.0313)	(0.221)	(0.0264)	(0.0547)	(0.0263)	(0.0196)	(0.0238)	(0.0189)
Q275	−0.114	0.0570	0.0936	−0.0247	−0.0364	0.0406	−0.0269	−0.0257	0.00900	0.00500	0.00243	0.00189
	(0.104)	(0.0396)	(0.0684)	(0.0360)	(0.0329)	(0.230)	(0.0546)	(0.0546)	(0.0245)	(0.0189)	(0.0227)	(0.0182)
Q276	0.190**	−0.0376	−0.0111	−0.00779	0.0461**	−0.406**	−0.0124	−0.0693*	0.0191	0.0151	0.00144	0.00104
	(0.0789)	(0.0237)	(0.0445)	(0.0275)	(0.0233)	(0.162)	(0.0226)	(0.0417)	(0.0181)	(0.0139)	(0.0146)	(0.0117)
Q277	0.232***	0.0595**	0.0391	0.0122	0.0771**	0.441**	0.0479**	0.151***	0.0237	0.0145	0.0434**	0.0315**
	(0.0835)	(0.0297)	(0.0520)	(0.0302)	(0.0303)	(0.174)	(0.0240)	(0.0424)	(0.0207)	(0.0163)	(0.0175)	(0.0146)
Q278	−0.0732	−0.00780	−0.0183	−0.0165	−0.0392	−0.242	−0.0429**	−0.0806**	−0.00775	−0.00730	−0.0187	−0.0172
	(0.0785)	(0.0248)	(0.0437)	(0.0263)	(0.0266)	(0.171)	(0.0208)	(0.0392)	(0.0159)	(0.0121)	(0.0133)	(0.0105)
Q279	−0.0179	−0.00887	0.0191	0.0591*	0.00114	0.0303	0.0398	0.0170	−4.48e-05	0.00264	0.00242	0.00526
	(0.0951)	(0.0287)	(0.0553)	(0.0349)	(0.0332)	(0.194)	(0.0260)	(0.0464)	(0.0205)	(0.0164)	(0.0167)	(0.0140)
Q2710	−0.0585	−0.00639	0.0588	−0.0138	−0.00276	0.0795	0.0656***	0.0200	−0.0130	−0.0106	−0.00226	−0.00124
	(0.0875)	(0.0300)	(0.0476)	(0.0298)	(0.0290)	(0.181)	(0.0190)	(0.0407)	(0.0196)	(0.0158)	(0.0167)	(0.0141)
Q301	0.0379	−0.0224	−0.0667	−0.0540**	0.00349	−0.228	−0.0413**	−0.0600*	−0.00347	−0.0117	−0.0130	−0.0176
	(0.0714)	(0.0259)	(0.0452)	(0.0241)	(0.0229)	(0.140)	(0.0178)	(0.0344)	(0.0188)	(0.0136)	(0.0156)	(0.0123)
Q302	−0.0149	−0.00355	−0.0683*	−0.0154	0.00297	−0.00126	−0.00257	0.00791	−0.00564	−0.00888	−9.13e-05	−0.00326
	(0.0609)	(0.0228)	(0.0365)	(0.0228)	(0.0174)	(0.142)	(0.0177)	(0.0375)	(0.0163)	(0.0121)	(0.0141)	(0.0112)
Q303	−0.142*	−0.00269	−0.00816	0.0276	−0.0313	0.102	−0.0135	−0.0124	−0.0242	−0.0146	−0.0185	−0.0105
	(0.0742)	(0.0305)	(0.0469)	(0.0280)	(0.0228)	(0.172)	(0.0187)	(0.0433)	(0.0211)	(0.0161)	(0.0183)	(0.0148)
Q304	0.146*	0.00345	0.0861	−0.00649	0.0283	−0.133	−0.0164	−0.00697	0.0247	0.0126	0.0147	0.00642
	(0.0758)	(0.0274)	(0.0524)	(0.0298)	(0.0207)	(0.180)	(0.0174)	(0.0420)	(0.0207)	(0.0161)	(0.0172)	(0.0140)
Q305	−0.0309	−0.0165	−0.00239	0.0487*	0.00304	−0.308*	−0.00713	−0.0485	−0.00699	0.00709	−0.0149	−0.00346
	(0.0762)	(0.0275)	(0.0466)	(0.0294)	(0.0230)	(0.169)	(0.0189)	(0.0399)	(0.0195)	(0.0160)	(0.0161)	(0.0141)
Q306	−0.0884	−0.00708	−0.0750	0.00324	0.00646	0.264	0.00797	0.0369	−0.0434**	−0.0326*	−0.0181	−0.0140
	(0.0844)	(0.0325)	(0.0546)	(0.0329)	(0.0275)	(0.206)	(0.0218)	(0.0468)	(0.0181)	(0.0181)	(0.0187)	(0.0165)
Q307	0.0747	0.0539*	0.0455	0.0886***	0.0380	0.240	−0.0199	0.0470	0.0370*	0.0388**	0.0310	0.0329*
	(0.0843)	(0.0315)	(0.0604)	(0.0328)	(0.0266)	(0.199)	(0.0234)	(0.0501)	(0.0217)	(0.0176)	(0.0200)	(0.0169)
Q308	0.000385	−0.0460*	−0.00762	−0.00434	0.00446	−0.362**	−0.0125	−0.0606	−0.00617	−0.00171	−0.0165	−0.0119
	(0.0651)	(0.0262)	(0.0411)	(0.0237)	(0.0194)	(0.155)	(0.0209)	(0.0400)	(0.0160)	(0.0120)	(0.0148)	(0.0119)
Q309	0.0606	−0.0203	−0.0389	−0.0653***	−0.0107	0.0314	−0.00741	−0.00404	−0.00150	−0.0116	−0.00191	−0.00800
	(0.0755)	(0.0292)	(0.0413)	(0.0243)	(0.0225)	(0.170)	(0.0220)	(0.0417)	(0.0182)	(0.0136)	(0.0159)	(0.0129)
Q3010	−0.0750	−0.00229	0.0365	−0.0473	−0.0461*	−0.0168	0.0318	−0.0172	−0.00287	−0.00704	−0.00714	−0.0102
	(0.0849)	(0.0323)	(0.0530)	(0.0344)	(0.0247)	(0.190)	(0.0224)	(0.0450)	(0.0197)	(0.0154)	(0.0180)	(0.0150)
Q311	0.165*	−0.0499	−0.00947	0.0264	−0.0264	−0.145	0.0431	−0.0172	0.00898	0.0119	0.000691	0.00482
	(0.0973)	(0.0329)	(0.0629)	(0.0347)	(0.0310)	(0.189)	(0.0268)	(0.0518)	(0.0256)	(0.0210)	(0.0211)	(0.0177)
Q312	0.00603	0.0330	−0.0954	−0.0350	0.00784	0.208	−0.0448	0.0149	0.0127	−0.000946	0.0123	0.00155
	(0.113)	(0.0476)	(0.0767)	(0.0431)	(0.0336)	(0.259)	(0.0302)	(0.0665)	(0.0329)	(0.0251)	(0.0283)	(0.0230)

Appendix Table 2 (*continued*)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ind1	ind2	ind3	ind4	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
Q313	−0.0402	−0.0115	0.0962	−0.0184	−0.00215	−0.376	0.0899***	−0.0400	0.0109	0.00734	−5.68e-05	−0.000764
	(0.119)	(0.0451)	(0.0739)	(0.0409)	(0.0383)	(0.285)	(0.0327)	(0.0662)	(0.0294)	(0.0223)	(0.0257)	(0.0205)
Q314	0.166*	0.0441	−0.00126	0.0394	0.0582**	0.237	−0.0276	0.0821	0.0285	0.0354*	0.0308	0.0347**
	(0.0992)	(0.0377)	(0.0634)	(0.0378)	(0.0269)	(0.237)	(0.0280)	(0.0579)	(0.0247)	(0.0191)	(0.0209)	(0.0171)
Q315	0.00428	−0.0414	−0.114*	0.0197	0.00306	−0.00939	−0.0470*	−0.0302	−0.0325	−0.0252	−0.0284	−0.0211
	(0.107)	(0.0399)	(0.0631)	(0.0353)	(0.0338)	(0.239)	(0.0271)	(0.0577)	(0.0252)	(0.0191)	(0.0223)	(0.0181)
Q316	−0.0515	−0.0631	−0.161*	−0.0642	−0.0128	0.00926	−0.0331	−0.0108	−0.0829**	−0.0688**	−0.0547	−0.0503*
	(0.127)	(0.0517)	(0.0838)	(0.0451)	(0.0364)	(0.315)	(0.0370)	(0.0827)	(0.0388)	(0.0294)	(0.0334)	(0.0272)
Q317	−0.0808	0.123**	0.231**	0.0241	0.0599	0.233	0.0500	0.0955	0.0781**	0.0637**	0.0678**	0.0624**
	(0.137)	(0.0551)	(0.0905)	(0.0422)	(0.0378)	(0.319)	(0.0363)	(0.0802)	(0.0363)	(0.0283)	(0.0330)	(0.0280)
Q318	0.193*	0.0262	−0.0145	0.0437	0.0439	0.244	−0.0368	0.0557	0.0132	0.00673	0.0214	0.0119
	(0.106)	(0.0437)	(0.0754)	(0.0405)	(0.0316)	(0.239)	(0.0317)	(0.0589)	(0.0285)	(0.0227)	(0.0250)	(0.0212)
Q319	−0.149	0.000902	0.0972*	0.0155	−0.0337	−0.109	0.0541**	−0.0260	−0.00179	0.00191	−0.00970	−0.00150
	(0.105)	(0.0340)	(0.0555)	(0.0380)	(0.0320)	(0.208)	(0.0261)	(0.0531)	(0.0232)	(0.0185)	(0.0195)	(0.0164)
Q3110	−0.0137	0.0452	0.0504	0.0201	−0.0310	0.201	0.0242	0.0445	0.0326	0.0283	0.0319	0.0243
	(0.0946)	(0.0335)	(0.0644)	(0.0350)	(0.0277)	(0.193)	(0.0257)	(0.0523)	(0.0230)	(0.0176)	(0.0208)	(0.0168)
Q32	−0.272*	0.0179	−0.136	0.0580	−0.102**	0.00727	0.00154	−0.0586	−0.0169	−0.00822	−0.0169	−0.0138
	(0.157)	(0.0542)	(0.0887)	(0.0557)	(0.0511)	(0.323)	(0.0345)	(0.0870)	(0.0365)	(0.0263)	(0.0312)	(0.0236)
SC11	0.00356	0.00268	0.00276	−0.0137***	0.00339	0.0161	0.00392*	0.00673	0.00108	−0.00180	0.00141	−0.000612
	(0.00794)	(0.00301)	(0.00473)	(0.00238)	(0.00249)	(0.0163)	(0.00202)	(0.00440)	(0.00197)	(0.00151)	(0.00182)	(0.00147)
Q351	−9.45e-05	0.0127*	0.00278	−0.00163	0.00181	0.132***	0.0113**	0.0350***	−0.00113	−0.000892	0.00546	0.00417
	(0.0207)	(0.00723)	(0.0120)	(0.00662)	(0.00597)	(0.0416)	(0.00517)	(0.0102)	(0.00508)	(0.00388)	(0.00443)	(0.00359)
Q36	0.484***	0.0576	0.0101	0.0423	0.0709	0.145	0.00967	0.0889	0.0793**	0.0631***	0.0600**	0.0521**
	(0.155)	(0.0436)	(0.0741)	(0.0413)	(0.0434)	(0.259)	(0.0335)	(0.0666)	(0.0309)	(0.0234)	(0.0259)	(0.0211)
Q37	−0.0833	−0.0721	−0.253*	−0.101	−0.118*	0.490	−0.0566	0.0489	−0.0933	−0.0905**	−0.0549	−0.0647
	(0.234)	(0.0903)	(0.148)	(0.0899)	(0.0710)	(0.534)	(0.0633)	(0.126)	(0.0590)	(0.0461)	(0.0521)	(0.0424)
Q381	0.0118	0.00417	0.00768	−0.0406	0.0706*	0.0713	−0.0317	0.0532	−0.0113	−0.0135	−0.00156	0.000469
	(0.126)	(0.0494)	(0.0832)	(0.0415)	(0.0377)	(0.270)	(0.0453)	(0.0659)	(0.0299)	(0.0222)	(0.0264)	(0.0201)
family1	0.0101	−0.0168	0.299**	−0.0143	0.0531	−0.766*	0.102*	−0.120	0.0341	0.0357	−0.00176	0.0117
	(0.206)	(0.0821)	(0.129)	(0.0681)	(0.0644)	(0.447)	(0.0545)	(0.114)	(0.0526)	(0.0410)	(0.0484)	(0.0399)
family2	−0.498	0.0196	0.162	0.0506	0.0602	−1.056*	0.0329	−0.108	0.0103	0.0120	−0.0280	−0.0174
	(0.366)	(0.106)	(0.169)	(0.0919)	(0.0932)	(0.588)	(0.0735)	(0.122)	(0.0642)	(0.0515)	(0.0559)	(0.0466)
family3	−0.341	−0.0271	0.0863	0.0807	−0.119	−0.635	0.0154	−0.145	−0.0288	−0.00661	−0.0439	−0.0248
	(0.250)	(0.0815)	(0.158)	(0.0771)	(0.0784)	(0.453)	(0.0725)	(0.114)	(0.0539)	(0.0432)	(0.0465)	(0.0395)
family4	−0.395	0.107	0.482***	0.114	−0.164**	0.0629	0.159***	0.0830	0.0515	0.0791*	0.0466	0.0636
	(0.254)	(0.0923)	(0.168)	(0.0797)	(0.0834)	(0.471)	(0.0543)	(0.113)	(0.0603)	(0.0464)	(0.0549)	(0.0450)
family5	−0.229	0.0602	0.176	−0.115*	0.0150	0.0488	0.120**	0.0804	0.0270	0.0234	0.0323	0.0345
	(0.206)	(0.0784)	(0.127)	(0.0685)	(0.0582)	(0.381)	(0.0499)	(0.0911)	(0.0507)	(0.0383)	(0.0434)	(0.0360)
family6	−0.317	0.00120	−0.0602	0.0590	−0.00985	−0.149	0.00410	−0.00154	−0.0587	−0.0167	−0.0459	−0.0193
	(0.221)	(0.0867)	(0.147)	(0.0732)	(0.0639)	(0.458)	(0.0576)	(0.116)	(0.0537)	(0.0412)	(0.0493)	(0.0398)
emp1	−0.0366	0.202*	0.123	0.00353	−0.0321	0.769	−0.000893	0.200	0.0718	0.0481	0.0759	0.0555
	(0.294)	(0.108)	(0.132)	(0.0830)	(0.0919)	(0.738)	(0.0686)	(0.160)	(0.0516)	(0.0400)	(0.0525)	(0.0409)
emp2	−0.366	0.0129	0.278*	0.0211		−0.471	0.150***	−0.0529	0.0178	0.0387	0.00143	0.0177
	(0.266)	(0.0895)	(0.150)	(0.0861)		(0.427)	(0.0496)	(0.107)	(0.0546)	(0.0414)	(0.0467)	(0.0376)
emp3	−0.285	0.00355	−0.0403	−0.0384	−0.0226	−0.173	0.0107	0.0291	−0.0562	−0.0445	−0.0226	−0.0258
	(0.297)	(0.0949)	(0.145)	(0.0739)	(0.0918)	(0.506)	(0.0566)	(0.130)	(0.0630)	(0.0443)	(0.0518)	(0.0413)
emp4	−3.025***	0.112	0.214			0.995		0.194	−0.0190	−0.111	−0.0144	−0.0896
	(0.569)	(0.148)	(0.266)			(0.811)		(0.243)	(0.0989)	(0.0711)	(0.0873)	(0.0683)
emp5	0.588*	0.0471	0.00441	−0.0262	0.140*	0.507	0.0506	0.241	0.0783	0.0442	0.0937	0.0621
	(0.313)	(0.104)	(0.167)	(0.0950)	(0.0779)	(0.577)	(0.0774)	(0.164)	(0.0864)	(0.0771)	(0.0790)	(0.0718)
emp6	0.167	0.0324	−0.0921	−0.0252	0.148**	0.615	−0.0155	0.234**	−0.0248	−0.0296	0.0205	0.0116
	(0.212)	(0.0757)	(0.131)	(0.0798)	(0.0710)	(0.403)	(0.0479)	(0.103)	(0.0511)	(0.0365)	(0.0455)	(0.0352)
num	0.162	0.0234	0.0316	0.0563	−0.0275	0.162	0.0266	−0.0116	0.0444	0.0349	0.0331	0.0247
	(0.142)	(0.0578)	(0.0975)	(0.0513)	(0.0437)	(0.288)	(0.0496)	(0.0752)	(0.0360)	(0.0283)	(0.0313)	(0.0254)
inc	8.39e-05	9.09e-05	0.000153	−1.08e-05	6.02e-05	0.000562	8.79e-05	0.000191	3.33e-05	−4.16e-06	5.56e-05	1.91e-05
	(0.000266)	(8.89e-05)	(0.000143)	(6.90e-05)	(8.13e-05)	(0.000468)	(6.29e-05)	(0.000133)	(6.49e-05)	(4.96e-05)	(5.94e-05)	(4.85e-05)
Observations	360	360	360	352	337	360	357	360	360	360	360	360

Standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Appendix Table 3
Marginal effects of social capital indicators for SNS users (Minato Mirai 21).
*A description of the variable symbols is provided in Appendix Table 5.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	ind1	ind2	ind3	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
Q101	0.00677	−0.0187	0.0103	−0.0134	−0.113	−0.0132	−0.0122	0.00373	0.00366	−0.00589	−0.00409
	(0.0362)	(0.0137)	(0.0167)	(0.0220)	(0.0698)	(0.0162)	(0.0181)	(0.0116)	(0.00925)	(0.00947)	(0.00821)
Q102	−0.00248	−0.00761	0.0116	−0.0137	−0.0167	0.00786	−0.00293	−0.000369	0.000990	−0.000790	−0.000431
	(0.0324)	(0.0131)	(0.0190)	(0.0200)	(0.0640)	(0.0153)	(0.0176)	(0.00965)	(0.00739)	(0.00825)	(0.00710)
Q103	−0.0490	−0.0289	−0.0235	−0.0195	−0.146	−0.0403**	−0.0527**	−0.0167	−0.0131	−0.0219*	−0.0190*

(continued on next page)

Appendix Table 3 (*continued*)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	ind1	ind2	ind3	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
	(0.0458)	(0.0193)	(0.0224)	(0.0290)	(0.0930)	(0.0178)	(0.0256)	(0.0135)	(0.0103)	(0.0120)	(0.0102)
Q104	−0.0648**	0.0279**	−0.00214	−0.00829	0.199***	−0.0162	0.0193	−0.00496	−0.00579	0.00200	0.000733
	(0.0328)	(0.0133)	(0.0173)	(0.0212)	(0.0705)	(0.0151)	(0.0170)	(0.00937)	(0.00721)	(0.00793)	(0.00671)
Q105	0.00795	−0.0322**	−0.0145	0.00377	−0.132	−0.00991	−0.0291	−0.00967	−0.00717	−0.0134	−0.0109
	(0.0341)	(0.0146)	(0.0184)	(0.0229)	(0.0828)	(0.0172)	(0.0201)	(0.0109)	(0.00800)	(0.00899)	(0.00732)
Q271	−0.00231	−0.00541	−0.0415*	−0.00262	0.000525	−0.0388*	−0.00916	−0.0151	−0.0114	−0.0129	−0.0115
	(0.0395)	(0.0153)	(0.0220)	(0.0260)	(0.0773)	(0.0201)	(0.0213)	(0.0103)	(0.0103)	(0.0109)	(0.00932)
Q272	0.0788*	0.0606***	0.0280	0.0609**	0.245***	0.0206	0.0742***	0.0366***	0.0258**	0.0426***	0.0338***
	(0.0421)	(0.0171)	(0.0242)	(0.0273)	(0.0908)	(0.0219)	(0.0242)	(0.0140)	(0.0107)	(0.0117)	(0.00989)
Q273	−0.0333	−0.0114	−0.00600	−0.0360	−0.0242	0.00843	−0.0159	−0.00250	−0.000995	−0.00933	−0.00666
	(0.0381)	(0.0149)	(0.0200)	(0.0245)	(0.0846)	(0.0203)	(0.0224)	(0.0110)	(0.00877)	(0.00983)	(0.00853)
Q276	0.0374	−0.0152	−0.0241	0.0322	−0.0700	−0.0622***	−0.0140	−0.0112	−0.00846	−0.00819	−0.00683
	(0.0455)	(0.0199)	(0.0248)	(0.0271)	(0.103)	(0.0241)	(0.0268)	(0.0147)	(0.0114)	(0.0124)	(0.0108)
Q277	0.0125	0.0376**	0.0489**	−0.00851	0.272***	0.0642***	0.0580**	0.0165	0.0132	0.0241**	0.0224**
	(0.0431)	(0.0169)	(0.0231)	(0.0273)	(0.103)	(0.0215)	(0.0257)	(0.0131)	(0.00976)	(0.0116)	(0.00974)
Q278	−0.0135	−0.0362**	−0.0335*	0.0134	−0.201**	0.00532	−0.0244	−0.0173	−0.0130	−0.0168	−0.0136
	(0.0392)	(0.0161)	(0.0200)	(0.0239)	(0.0804)	(0.0208)	(0.0215)	(0.0124)	(0.00938)	(0.0102)	(0.00881)
Q2815	0.0881	−0.0134	−0.0212	0.0668	0.174	0.00982	0.0272	−0.0143	−0.0132	0.0101	0.00456
	(0.116)	(0.0479)	(0.0590)	(0.0707)	(0.228)	(0.0546)	(0.0622)	(0.0373)	(0.0289)	(0.0314)	(0.0270)
Q2817	0.00390	0.0328	0.00389	0.134**	0.178	0.0612	0.0722	−0.0178	−0.0146	0.0111	0.0111
	(0.0989)	(0.0495)	(0.0658)	(0.0683)	(0.212)	(0.0552)	(0.0588)	(0.0371)	(0.0281)	(0.0309)	(0.0263)
Q2825	−0.0557	0.00646	0.144**	−0.0307	0.00702	0.178**	0.0132	0.0101	0.00636	0.00513	0.00455
	(0.135)	(0.0583)	(0.0708)	(0.0904)	(0.282)	(0.0781)	(0.0748)	(0.0450)	(0.0327)	(0.0353)	(0.0302)
Q2827	−0.0406	0.0631	−0.00567	−0.0244	0.0449	−0.0463	−0.0499	0.0255	0.0234	0.0157	0.0118
	(0.179)	(0.0871)	(0.111)	(0.119)	(0.391)	(0.0854)	(0.0944)	(0.0700)	(0.0520)	(0.0504)	(0.0437)
Q2835	0.226*	−0.0250	−0.0450	0.0965	−0.367	−0.0506	−0.0170	0.0298	0.0279	0.0125	0.0152
	(0.118)	(0.0494)	(0.0619)	(0.0733)	(0.250)	(0.0619)	(0.0636)	(0.0369)	(0.0279)	(0.0287)	(0.0246)
Q2837	−0.235*	0.0402	0.0642	−0.213**	0.130	0.0370	−0.0229	0.00812	0.00220	−0.00637	−0.0108
	(0.140)	(0.0549)	(0.0763)	(0.0860)	(0.288)	(0.0666)	(0.0720)	(0.0421)	(0.0327)	(0.0315)	(0.0275)
Q2845	−0.0554	−0.00148	0.121**	−0.0215	−0.376*	−0.0296	−0.0917	0.0186	0.0140	−0.0115	−0.0120
	(0.106)	(0.0394)	(0.0580)	(0.0649)	(0.211)	(0.0501)	(0.0571)	(0.0330)	(0.0252)	(0.0270)	(0.0229)
Q2847	0.204**	0.107**	0.0571	0.108*	0.538**	0.0883*	0.160***	0.0703**	0.0565**	0.0865***	0.0742***
	(0.0935)	(0.0428)	(0.0573)	(0.0632)	(0.215)	(0.0484)	(0.0558)	(0.0315)	(0.0254)	(0.0274)	(0.0240)
Q2855	−0.169	−0.0412	−0.0200	−0.262**	−0.0227	−0.159	−0.148	−0.0193	−0.0192	−0.0458	−0.0434
	(0.157)	(0.0723)	(0.0850)	(0.130)	(0.348)	(0.101)	(0.104)	(0.0592)	(0.0465)	(0.0458)	(0.0382)
Q2857	0.155	0.0291	0.0436	0.125	−0.753	−0.0238	−0.0331	0.0673	0.0585	0.0282	0.0291
	(0.173)	(0.0963)	(0.127)	(0.150)	(0.462)	(0.104)	(0.0913)	(0.0678)	(0.0533)	(0.0530)	(0.0434)
Q291	−0.0751	0.152***	−0.0238	−0.136*	0.775***	−0.00620	0.103*	0.0554	0.0429	0.0591**	0.0474*
	(0.107)	(0.0495)	(0.0578)	(0.0742)	(0.237)	(0.0574)	(0.0578)	(0.0350)	(0.0275)	(0.0298)	(0.0260)
Q292	0.218*	−0.0161	−0.0244	0.103	−0.00841	−0.00247	0.0464	0.0232	0.0246	0.0236	0.0260
	(0.112)	(0.0502)	(0.0571)	(0.0745)	(0.241)	(0.0601)	(0.0602)	(0.0368)	(0.0289)	(0.0308)	(0.0265)
Q295	0.0546	0.0600*	0.125***	0.0553	0.0507	0.0453	0.0520	0.0588**	0.0404*	0.0474**	0.0378**
	(0.0850)	(0.0339)	(0.0460)	(0.0530)	(0.179)	(0.0395)	(0.0451)	(0.0271)	(0.0208)	(0.0221)	(0.0190)
Q296	−0.0636	0.0287	−0.0381	−0.00262	−0.180	−0.0216	−0.0188	0.0143	0.00992	0.00637	0.00177
	(0.0781)	(0.0350)	(0.0433)	(0.0515)	(0.169)	(0.0391)	(0.0452)	(0.0241)	(0.0189)	(0.0208)	(0.0180)
Q297	−0.153	0.0399	0.0105	−0.0485	−0.0489	−0.0542	−0.0474	−0.0249	−0.0198	−0.0188	−0.0184
	(0.0994)	(0.0453)	(0.0540)	(0.0647)	(0.228)	(0.0558)	(0.0611)	(0.0311)	(0.0240)	(0.0271)	(0.0234)
Q298	−0.226*	0.0343	0.0990	−0.0766	0.279	0.0496	0.0395	−0.0179	−0.0217	−0.00346	−0.00302
	(0.116)	(0.0529)	(0.0694)	(0.0770)	(0.268)	(0.0577)	(0.0658)	(0.0378)	(0.0307)	(0.0325)	(0.0289)
Q301	−0.0763**	0.0104	0.0179	−0.0171	−0.0440	−0.0216	−0.0155	−0.00577	−0.00653	−0.00843	−0.00634
	(0.0376)	(0.0160)	(0.0219)	(0.0258)	(0.0861)	(0.0202)	(0.0223)	(0.0133)	(0.0102)	(0.0100)	(0.00852)
Q302	0.00237	0.00675	0.0169	0.0151	0.0502	0.0118	0.0191	0.00556	0.00306	0.00716	0.00494
	(0.0329)	(0.0131)	(0.0163)	(0.0205)	(0.0691)	(0.0166)	(0.0186)	(0.0103)	(0.00802)	(0.00858)	(0.00738)
Q305	0.0653	0.0259	0.0905***	0.0305	0.158*	0.0503**	0.0466*	0.0209	0.0173	0.0255**	0.0219**
	(0.0475)	(0.0162)	(0.0246)	(0.0301)	(0.0896)	(0.0235)	(0.0253)	(0.0142)	(0.0109)	(0.0112)	(0.00941)
Q306	−0.183***	−0.0216	−0.0407	−0.0929***	−0.103	−0.0209	−0.0574*	−0.0381**	−0.0317**	−0.0395***	−0.0359***
	(0.0535)	(0.0206)	(0.0306)	(0.0332)	(0.107)	(0.0242)	(0.0337)	(0.0162)	(0.0127)	(0.0143)	(0.0121)
Q307	0.200***	−0.0196	−0.0332	0.0978***	−0.100	0.0288	0.0299	0.0278*	0.0224*	0.0256**	0.0221**
	(0.0494)	(0.0191)	(0.0260)	(0.0308)	(0.101)	(0.0216)	(0.0266)	(0.0153)	(0.0120)	(0.0124)	(0.0104)
Q309	0.0302	−0.00586	−0.0388*	0.0106	0.112	−0.0301*	0.0138	−0.00919	−0.00714	−0.00473	−0.00440
	(0.0383)	(0.0141)	(0.0206)	(0.0238)	(0.0792)	(0.0175)	(0.0213)	(0.0122)	(0.00938)	(0.0102)	(0.00865)
Q311	0.0286	−0.0376	−0.0668**	0.0432	−0.268*	−0.00514	−0.0399	−0.0146	−0.00913	−0.0148	−0.0140
	(0.0635)	(0.0252)	(0.0331)	(0.0421)	(0.148)	(0.0327)	(0.0364)	(0.0197)	(0.0152)	(0.0164)	(0.0140)
Q312	0.0314	−0.0150	−0.0325	−0.00412	−0.118	−0.00236	−0.0191	0.0123	0.0116	0.00263	0.00446
	(0.0721)	(0.0278)	(0.0393)	(0.0438)	(0.153)	(0.0336)	(0.0384)	(0.0227)	(0.0176)	(0.0183)	(0.0158)
Q313	0.148*	−0.0206	0.0350	0.0897**	0.146	0.0439	0.0917**	−0.00610	−0.00316	0.0150	0.0137
	(0.0806)	(0.0298)	(0.0430)	(0.0441)	(0.169)	(0.0349)	(0.0428)	(0.0272)	(0.0213)	(0.0221)	(0.0191)
Q314	−0.00693	−0.0175	0.0287	−0.00636	−0.112	0.0259	−0.0115	−0.000732	0.000799	−0.00398	−0.000902
	(0.0633)	(0.0268)	(0.0353)	(0.0389)	(0.140)	(0.0259)	(0.0319)	(0.0209)	(0.0165)	(0.0175)	(0.0149)
Q317	−0.0450	0.0600**	0.0643*	−0.0464	0.306**	−0.00858	0.0316	0.0164	0.0109	0.0163	0.0119
	(0.0642)	(0.0264)	(0.0341)	(0.0406)	(0.146)	(0.0311)	(0.0373)	(0.0191)	(0.0144)	(0.0168)	(0.0143)
Q3110	0.0558	0.0500**	0.0676**	0.0595*	0.167	−0.0114	0.0408	0.0382**	0.0275**	0.0344**	0.0292**
	(0.0489)	(0.0233)	(0.0305)	(0.0325)	(0.120)	(0.0264)	(0.0284)	(0.0170)	(0.0128)	(0.0128)	(0.0121)
Q331	−0.00361	−0.000240	0.00521**	−0.00129	0.00177	0.00387	0.000479	0.000164	−2.59e-05	0.000208	0.000169

Appendix Table 3 (*continued*)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	ind1	ind2	ind3	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
	(0.00499)	(0.00203)	(0.00250)	(0.00297)	(0.0112)	(0.00261)	(0.00285)	(0.00144)	(0.00114)	(0.00131)	(0.00113)
Q35	0.0500	0.0269	−0.110	−0.0325	0.879**		0.130	−0.0226	−0.0150	0.0131	0.0145
	(0.172)	(0.0730)	(0.0743)	(0.0985)	(0.417)		(0.0823)	(0.0560)	(0.0421)	(0.0408)	(0.0339)
Q361	−0.00722	0.00417	0.00347	−0.00331	0.0666***	−0.00276	0.0102*	−0.00207	−0.00196	0.00117	0.000699
	(0.0102)	(0.00388)	(0.00551)	(0.00618)	(0.0208)	(0.00456)	(0.00522)	(0.00320)	(0.00245)	(0.00268)	(0.00223)
family1	0.00457	−0.00333	−0.0580	−0.0706	−0.333	−0.0601	−0.0782	0.0205	0.0203	−0.0105	−0.00835
	(0.114)	(0.0413)	(0.0577)	(0.0677)	(0.229)	(0.0504)	(0.0605)	(0.0341)	(0.0266)	(0.0291)	(0.0251)
family2	−0.113	−0.0639	−0.0924	−0.117	−0.896**	−0.0528	−0.267**	−0.0119	−0.00449	−0.0804	−0.0553
	(0.227)	(0.100)	(0.107)	(0.148)	(0.446)	(0.110)	(0.114)	(0.0680)	(0.0495)	(0.0575)	(0.0454)
family3	0.0437	−0.0821	−0.0336	−0.178*	−0.876**	−0.0439	−0.200**	0.0549	0.0473	−0.0337	−0.0279
	(0.162)	(0.0617)	(0.101)	(0.104)	(0.362)	(0.0882)	(0.0881)	(0.0550)	(0.0433)	(0.0434)	(0.0378)
family4	−0.0799	0.0891	0.111	−0.0985	−0.106	0.0822	−0.0468	0.0768	0.0540	0.0267	0.0235
	(0.157)	(0.0672)	(0.104)	(0.105)	(0.349)	(0.0869)	(0.0881)	(0.0546)	(0.0428)	(0.0452)	(0.0394)
family5	−0.165	0.154**	0.106	−0.141	0.460	0.114	0.0870	0.0700	0.0481	0.0624*	0.0498
	(0.149)	(0.0635)	(0.0896)	(0.0968)	(0.336)	(0.0752)	(0.0733)	(0.0451)	(0.0345)	(0.0366)	(0.0321)
family6	−0.132	0.0617	−0.0854	−0.108	−0.0525	−0.0291	−0.0375	0.0359	0.0244	0.00265	0.000103
	(0.156)	(0.0731)	(0.117)	(0.103)	(0.350)	(0.0978)	(0.0901)	(0.0529)	(0.0422)	(0.0464)	(0.0408)
emp1	0.183	0.162***	0.271***	−0.0402	0.647**	0.151**	0.164**	0.134***	0.110***	0.123***	0.108***
	(0.144)	(0.0554)	(0.0797)	(0.0903)	(0.289)	(0.0622)	(0.0816)	(0.0489)	(0.0384)	(0.0418)	(0.0361)
emp2	−0.426***	0.113*	0.190***	−0.112	0.268	0.00448	−0.0252	−0.00408	−0.0110	−0.00606	−0.00726
	(0.165)	(0.0630)	(0.0655)	(0.102)	(0.330)	(0.0788)	(0.0887)	(0.0386)	(0.0290)	(0.0373)	(0.0312)
emp3	0.203	0.0410	−0.0530	0.0906	0.112	0.00206	0.0885	0.0571	0.0438	0.0492	0.0444
	(0.149)	(0.0471)	(0.0696)	(0.0877)	(0.270)	(0.0698)	(0.0748)	(0.0415)	(0.0334)	(0.0341)	(0.0294)
emp4	0.456	−0.00862	−0.00439	0.335*	0.0789		0.145	0.0831	0.0471	0.0818	0.0546
	(0.280)	(0.140)	(0.169)	(0.197)	(0.544)		(0.177)	(0.103)	(0.0835)	(0.0938)	(0.0815)
emp5	0.315	0.148**	0.195*	0.0669	0.816*	0.0426	0.182	0.130**	0.107**	0.130**	0.116**
	(0.228)	(0.0725)	(0.117)	(0.130)	(0.444)	(0.0893)	(0.130)	(0.0636)	(0.0539)	(0.0575)	(0.0520)
emp6	0.115	0.0568	0.0549	0.0320	0.292	0.0413	0.0569	0.0419	0.0334	0.0429	0.0382
	(0.115)	(0.0460)	(0.0670)	(0.0758)	(0.230)	(0.0586)	(0.0622)	(0.0368)	(0.0290)	(0.0293)	(0.0258)
num	0.0140	0.0282	−0.0255	0.0524	0.512***	−0.00672	0.102***	−0.0319	−0.0229	0.0117	0.0103
	(0.0671)	(0.0294)	(0.0442)	(0.0435)	(0.171)	(0.0362)	(0.0382)	(0.0228)	(0.0176)	(0.0185)	(0.0161)
inc	0.000206	−4.06e-05	−0.000118	8.13e-05	−0.000146	−0.000126	−5.07e-05	−1.27e-06	−7.05e-07	−2.08e-05	−1.24e-05
	(0.000166)	(6.26e-05)	(8.79e-05)	(9.74e-05)	(0.000327)	(7.64e-05)	(9.64e-05)	(5.11e-05)	(4.00e-05)	(4.27e-05)	(3.70e-05)
Observations	344	344	344	344	344	314	344	344	344	344	344

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix Table 4

Marginal effects of social capital indicators for SNS users (other metropolitan areas).

*A description of the variable symbols is provided in Appendix Table 5.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	ind1	ind2	ind3	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
Q101	0.00984	0.0426**	0.00641	0.0158	0.214*	−0.0279*	0.0347	0.0127	0.00948	0.0175*	0.0145*
	(0.0532)	(0.0192)	(0.0309)	(0.0184)	(0.115)	(0.0155)	(0.0265)	(0.0116)	(0.00793)	(0.0102)	(0.00782)
Q102	−0.0146	−0.00505	0.0285	−0.0102	−0.0407	0.0206*	−0.0102	0.00185	−0.000384	−0.000738	−0.00120
	(0.0562)	(0.0180)	(0.0278)	(0.0168)	(0.101)	(0.0111)	(0.0251)	(0.0110)	(0.00721)	(0.01000)	(0.00737)
Q104	0.0186	0.00790	0.0104	−0.0112	−0.0704	0.00505	0.000551	0.0169	0.0138*	0.00810	0.00775
	(0.0530)	(0.0192)	(0.0343)	(0.0185)	(0.120)	(0.0166)	(0.0292)	(0.0118)	(0.00797)	(0.0104)	(0.00807)
Q103	−0.0432	0.00637	−0.0108	−0.0214	−0.119	−0.0111	−0.0383	−0.00342	−0.00535	−0.00770	−0.00941
	(0.0638)	(0.0235)	(0.0423)	(0.0171)	(0.132)	(0.0146)	(0.0327)	(0.0149)	(0.00989)	(0.0151)	(0.0113)
Q105	0.136***	0.0592***	0.105**	0.0608***	0.280**	0.0523***	0.104***	0.0378**	0.0292**	0.0448***	0.0368***
	(0.0526)	(0.0217)	(0.0431)	(0.0176)	(0.122)	(0.0139)	(0.0312)	(0.0163)	(0.0122)	(0.0140)	(0.0117)
Q271	−0.104	0.0538*	0.114**	0.0184	0.124	0.0361	0.0254	0.0230	0.0145	0.0242	0.0187
	(0.0772)	(0.0294)	(0.0505)	(0.0266)	(0.174)	(0.0239)	(0.0439)	(0.0182)	(0.0116)	(0.0164)	(0.0116)
Q272	−0.0564	0.0470*	0.0406	−0.0489**	0.397**	0.0418*	0.0819**	0.00397	0.00496	0.0145	0.0116
	(0.0740)	(0.0262)	(0.0425)	(0.0248)	(0.156)	(0.0218)	(0.0381)	(0.0176)	(0.0114)	(0.0156)	(0.0112)
Q273	−0.128*	−0.0253	−0.101**	−0.00273	0.112	−0.0423**	0.0150	−0.0496**	−0.0326**	−0.0241	−0.0170
	(0.0740)	(0.0289)	(0.0419)	(0.0225)	(0.161)	(0.0188)	(0.0402)	(0.0193)	(0.0167)	(0.0167)	(0.0121)
Q276	0.134	−0.0128	0.0533	−0.0124	−0.230	0.00798	−0.0446	0.0369**	0.0260**	0.0155	0.0127
	(0.0847)	(0.0250)	(0.0503)	(0.0247)	(0.158)	(0.0248)	(0.0439)	(0.0182)	(0.0113)	(0.0155)	(0.0108)
Q277	0.243***	0.0447*	0.0217	0.143***	0.477***	0.0709***	0.170***	0.0112	0.00570	0.0376**	0.0281**
	(0.0848)	(0.0267)	(0.0559)	(0.0318)	(0.177)	(0.0251)	(0.0429)	(0.0195)	(0.0134)	(0.0169)	(0.0130)
Q278	−0.164*	−0.0239	0.0341	−0.0548**	−0.285*	0.0196	−0.0795**	−0.0127	−0.0101	−0.0213*	−0.0168*
	(0.0852)	(0.0218)	(0.0440)	(0.0242)	(0.155)	(0.0191)	(0.0343)	(0.0152)	(0.0101)	(0.0126)	(0.00901)
Q2815	−0.0412	−0.0249	0.0681	−0.0641	−0.0201	0.0557	0.0478	0.00527	0.000437	0.000373	−0.00517
	(0.164)	(0.0643)	(0.101)	(0.0616)	(0.397)	(0.0490)	(0.0906)	(0.0406)	(0.0273)	(0.0340)	(0.0254)
Q2817	0.171	−0.0560	−0.0883	0.122	−0.952*	−0.0349	−0.137	0.0350	0.0223	−0.00926	−0.00727
	(0.267)	(0.0734)	(0.128)	(0.0756)	(0.524)	(0.0601)	(0.123)	(0.0458)	(0.0331)	(0.0418)	(0.0331)
Q2825	0.211	−0.00830	0.0993	−0.107	−0.208	0.0142	−0.0263	0.0337	0.0377	0.0143	0.0221
	(0.221)	(0.0775)	(0.130)	(0.0877)	(0.459)	(0.0691)	(0.119)	(0.0462)	(0.0303)	(0.0435)	(0.0323)

Appendix Table 4 (*continued*)

Variables	(1) ind1	(2) ind2	(3) ind3	(4) ind5	(5) ind6	(6) ind7	(7) ind8	(8) ind9	(9) ind10	(10) ind11	(11) ind12
Q2827	−0.232	−0.0855	0.0143	0.117	−0.585	0.165	−0.0988	−0.0543	−0.0491	−0.0652	−0.0572
	(0.319)	(0.116)	(0.193)	(0.129)	(0.718)	(0.105)	(0.182)	(0.0669)	(0.0454)	(0.0665)	(0.0504)
Q2845	0.0733	−0.0795	−0.0461	0.122*	−0.767*	0.0166	−0.115	−0.0226	−0.0244	−0.0361	−0.0365
	(0.193)	(0.0648)	(0.117)	(0.0685)	(0.466)	(0.0543)	(0.107)	(0.0442)	(0.0293)	(0.0380)	(0.0291)
Q2847	0.219	0.114	−0.0315	−0.0204	2.031***	−0.0255	0.291**	−0.0106	−0.00786	0.0680	0.0539
	(0.295)	(0.102)	(0.173)	(0.103)	(0.674)	(0.0872)	(0.146)	(0.0716)	(0.0503)	(0.0621)	(0.0495)
Q2835	−0.439***	0.0636	0.104	−0.185***	−0.0176	−0.0146	−0.0599	0.0103	0.00496	−0.00339	−0.00802
	(0.143)	(0.0551)	(0.0912)	(0.0456)	(0.299)	(0.0404)	(0.0797)	(0.0340)	(0.0229)	(0.0317)	(0.0243)
Q2837	0.201	0.147**	0.0651	0.0601	0.761**	0.0189	0.186**	0.0941**	0.0673**	0.0913**	0.0770***
	(0.167)	(0.0644)	(0.118)	(0.0581)	(0.378)	(0.0573)	(0.0915)	(0.0388)	(0.0283)	(0.0361)	(0.0293)
Q2855	0.100	−0.115	−0.264	0.212**	−0.646	−0.0803	−0.209	−0.0444	−0.0350	−0.0607	−0.0418
	(0.235)	(0.111)	(0.162)	(0.0928)	(0.657)	(0.0707)	(0.175)	(0.0656)	(0.0487)	(0.0620)	(0.0511)
Q2857	0.407*	0.0357	0.0153	0.0785	0.544	−0.0134	0.146	0.0718	0.0597	0.0669	0.0582
	(0.241)	(0.110)	(0.167)	(0.0947)	(0.582)	(0.0662)	(0.127)	(0.0747)	(0.0587)	(0.0625)	(0.0550)
Q291	−0.0224	0.0390	0.0686	0.0684	−0.296	0.0355	−0.0351	0.0258	0.0246	0.0212	0.0197
	(0.170)	(0.0711)	(0.124)	(0.0557)	(0.410)	(0.0417)	(0.103)	(0.0458)	(0.0325)	(0.0461)	(0.0370)
Q292	−0.169	0.0601	0.227	−0.204**	0.503	0.0948**	0.0996	0.0282	0.0112	0.0425	0.0341
	(0.216)	(0.0768)	(0.159)	(0.103)	(0.421)	(0.0477)	(0.110)	(0.0515)	(0.0383)	(0.0511)	(0.0422)
Q295	0.254*	0.0176	0.00679	0.109**	−0.578**	−0.0462	−0.0688	0.0603*	0.0399*	0.0237	0.0147
	(0.136)	(0.0474)	(0.0846)	(0.0453)	(0.280)	(0.0387)	(0.0706)	(0.0334)	(0.0221)	(0.0275)	(0.0207)
Q296	0.325**	−0.000782	0.0457	0.0651	−0.181	0.0244	0.0193	0.0222	0.00535	0.0182	0.00545
	(0.131)	(0.0463)	(0.0854)	(0.0421)	(0.287)	(0.0330)	(0.0721)	(0.0318)	(0.0221)	(0.0273)	(0.0217)
Q297	−0.641***	0.0339	−0.0406	−0.137*	0.523	−0.0645	0.0606	−0.0807*	−0.0505*	−0.0442	−0.0298
	(0.208)	(0.0715)	(0.120)	(0.0720)	(0.407)	(0.0494)	(0.0988)	(0.0455)	(0.0300)	(0.0422)	(0.0322)
Q298	−0.225	0.136*	−0.0353	−0.208**	0.622	−0.0427	0.0569	−0.00852	−0.00687	0.0126	0.00798
	(0.200)	(0.0757)	(0.114)	(0.0833)	(0.422)	(0.0478)	(0.0912)	(0.0465)	(0.0346)	(0.0421)	(0.0357)
Q301	0.0222	−0.0197	−0.0390	−0.0185	−0.121	−0.00755	−0.0483	0.00292	−0.000387	−0.00598	−0.00760
	(0.0700)	(0.0253)	(0.0434)	(0.0221)	(0.144)	(0.0189)	(0.0338)	(0.0173)	(0.0113)	(0.0146)	(0.0106)
Q302	−0.0296	−0.00513	−0.0615	−0.0221	−0.117	−0.0272*	−0.0232	−0.00410	−0.00556	−0.00528	−0.00559
	(0.0548)	(0.0213)	(0.0374)	(0.0172)	(0.124)	(0.0140)	(0.0311)	(0.0145)	(0.00956)	(0.0129)	(0.00941)
Q305	−0.0124	−0.0238	0.0184	0.000777	−0.312*	−0.0335*	−0.0436	−0.0133	−0.00787	−0.0174	−0.0136
	(0.0860)	(0.0280)	(0.0488)	(0.0233)	(0.179)	(0.0182)	(0.0424)	(0.0185)	(0.0129)	(0.0163)	(0.0130)
Q306	−0.143	−0.0271	−0.0756	−0.00418	0.175	−0.0322	0.00573	−0.0488**	−0.0415***	−0.0328*	−0.0283*
	(0.0960)	(0.0336)	(0.0576)	(0.0299)	(0.216)	(0.0215)	(0.0478)	(0.0211)	(0.0150)	(0.0193)	(0.0155)
Q307	0.0285	0.0394	0.0455	0.0486*	0.132	−0.00712	0.0318	0.0225	0.0201	0.0205	0.0177
	(0.0839)	(0.0290)	(0.0575)	(0.0289)	(0.207)	(0.0231)	(0.0491)	(0.0196)	(0.0138)	(0.0185)	(0.0147)
Q309	0.0288	−0.0180	0.0140	−0.0188	−0.162	0.0127	−0.0323	0.0105	0.0105	−0.00145	0.00155
	(0.0704)	(0.0257)	(0.0362)	(0.0203)	(0.143)	(0.0165)	(0.0315)	(0.0149)	(0.00979)	(0.0128)	(0.00953)
Q311	0.211*	−0.0230	−0.0188	−0.0162	0.196	0.00876	0.0791	−0.0111	−0.0119	0.00818	0.00425
	(0.125)	(0.0402)	(0.0769)	(0.0348)	(0.240)	(0.0353)	(0.0636)	(0.0268)	(0.0181)	(0.0245)	(0.0186)
Q312	−0.120	0.00260	−0.0315	−0.0323	0.113	−0.0127	−0.0266	0.00526	−0.00532	−0.00222	−0.00741
	(0.141)	(0.0534)	(0.0849)	(0.0431)	(0.274)	(0.0277)	(0.0672)	(0.0356)	(0.0246)	(0.0313)	(0.0240)
Q313	0.0202	−0.0431	0.0600	0.0292	−0.515*	0.0757**	−0.0640	0.0106	0.00892	−0.0120	−0.00553
	(0.146)	(0.0496)	(0.0887)	(0.0412)	(0.295)	(0.0351)	(0.0752)	(0.0339)	(0.0222)	(0.0308)	(0.0232)
Q314	0.174	0.0512	−0.0359	0.0671*	0.530*	−0.0244	0.127*	0.0102	0.0134	0.0340	0.0292
	(0.120)	(0.0432)	(0.0735)	(0.0363)	(0.274)	(0.0332)	(0.0686)	(0.0275)	(0.0186)	(0.0247)	(0.0188)
Q317	−0.0675	0.0480	0.0146	0.0919**	−0.0115	0.00886	0.0223	0.00958	0.00918	0.0112	0.0139
	(0.116)	(0.0407)	(0.0671)	(0.0392)	(0.237)	(0.0295)	(0.0602)	(0.0265)	(0.0185)	(0.0240)	(0.0187)
Q3110	−0.0154	0.0206	0.0210	−0.0437	0.222	0.0170	0.0364	0.0215	0.0220	0.0196	0.0156
	(0.102)	(0.0344)	(0.0639)	(0.0335)	(0.223)	(0.0266)	(0.0578)	(0.0229)	(0.0157)	(0.0210)	(0.0160)
SC11	0.0192**	0.00687**	0.0109**	0.00844**	0.0469**	0.00861***	0.0155***	0.00406*	0.00273*	0.00433**	0.00348**
	(0.00965)	(0.00328)	(0.00520)	(0.00331)	(0.0195)	(0.00244)	(0.00506)	(0.00220)	(0.00150)	(0.00199)	(0.00151)
Q351	−0.00997	0.00510	−0.00551	0.00307	0.0729	0.0121**	0.0196*	−0.00405	−0.00228	0.00133	0.00106
	(0.0242)	(0.00778)	(0.0131)	(0.00755)	(0.0446)	(0.00590)	(0.0117)	(0.00549)	(0.00375)	(0.00489)	(0.00372)
Q36	0.400**	−0.00343	−0.0358	0.0224	−0.0633	−0.0335	0.0108	0.0374	0.0260	0.0201	0.0133
	(0.162)	(0.0446)	(0.0830)	(0.0518)	(0.298)	(0.0439)	(0.0770)	(0.0301)	(0.0194)	(0.0260)	(0.0193)
family1	−0.219	−0.0686	0.0899	−0.0511	−0.348	0.126***	−0.0803	−0.0554	−0.0340	−0.0500	−0.0329
	(0.188)	(0.0688)	(0.109)	(0.0554)	(0.386)	(0.0457)	(0.104)	(0.0432)	(0.0297)	(0.0396)	(0.0305)
family2	−0.244	0.113	0.295*	0.215**	−0.788	0.0973	0.0164	0.0619	0.0502	0.0310	0.0316
	(0.381)	(0.103)	(0.162)	(0.107)	(0.631)	(0.0681)	(0.129)	(0.0613)	(0.0438)	(0.0532)	(0.0411)
family3	−0.407	−0.00367	0.0954	−0.225**	−0.189	0.124*	0.00269	−0.0438	−0.0322	−0.0132	−0.0129
	(0.287)	(0.0907)	(0.160)	(0.104)	(0.527)	(0.0644)	(0.132)	(0.0577)	(0.0386)	(0.0507)	(0.0397)
family4	−0.567*	0.0331	0.232	−0.151	−0.0527	0.142*	0.0327	−0.0534	−0.0233	−0.0230	−0.0137
	(0.299)	(0.105)	(0.186)	(0.105)	(0.556)	(0.0760)	(0.129)	(0.0634)	(0.0438)	(0.0604)	(0.0475)
family5	−0.105	0.0681	0.233*	0.0431	0.113	0.0763	0.0917	0.0210	0.0243	0.0377	0.0416
	(0.225)	(0.0730)	(0.123)	(0.0681)	(0.405)	(0.0510)	(0.0905)	(0.0467)	(0.0319)	(0.0406)	(0.0317)
family6	−0.182	0.0375	−0.0998	0.0695	0.546	0.0365	0.148	−0.0838	−0.0480	−0.0283	−0.0157
	(0.224)	(0.0890)	(0.144)	(0.0633)	(0.488)	(0.0725)	(0.117)	(0.0522)	(0.0335)	(0.0484)	(0.0359)
emp1	−3.368***	0.180	0.0879		0.0768	−0.00220	−0.0379	0.0181	0.00130	0.00492	−0.00685
	(0.472)	(0.110)	(0.153)		(0.719)	(0.0662)	(0.169)	(0.0573)	(0.0405)	(0.0562)	(0.0448)
emp2	−0.629*	−0.0997	−0.00671		−0.681	0.0622	−0.195	−0.0755	−0.0335	−0.0808	−0.0513
	(0.366)	(0.108)	(0.161)		(0.534)	(0.0575)	(0.140)	(0.0636)	(0.0411)	(0.0572)	(0.0426)
emp3	−0.295	−0.0879	−0.168	−0.0351	−0.467	0.0788	−0.0145	−0.137*	−0.0893**	−0.0797	−0.0624
	(0.254)	(0.0989)	(0.160)	(0.0749)	(0.528)	(0.0658)	(0.131)	(0.0730)	(0.0445)	(0.0563)	(0.0416)

Appendix Table 4 (*continued*)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	ind1	ind2	ind3	ind5	ind6	ind7	ind8	ind9	ind10	ind11	ind12
emp4	−2.460***	−0.303*	−0.517		−0.817		−0.221	−0.247**	−0.208**	−0.276***	−0.245***
	(0.515)	(0.181)	(0.319)		(0.968)		(0.224)	(0.119)	(0.0887)	(0.104)	(0.0832)
emp5	0.579	0.0698	0.114	0.202*	−0.788	−0.0567	0.00770	0.215*	0.172*	0.134	0.111
	(0.452)	(0.150)	(0.227)	(0.107)	(0.985)	(0.0908)	(0.196)	(0.125)	(0.0997)	(0.105)	(0.0902)
emp6	0.109	0.00491	−0.221*	0.142***	0.210	−0.0114	0.129	−0.0485	−0.0468	−0.0157	−0.0187
	(0.174)	(0.0697)	(0.119)	(0.0551)	(0.354)	(0.0559)	(0.0893)	(0.0445)	(0.0289)	(0.0397)	(0.0295)
num	0.155	0.00956	0.000745	−0.00490	0.224	0.0105	0.0322	0.0257	0.0159	0.0208	0.0150
	(0.0985)	(0.0343)	(0.0592)	(0.0317)	(0.175)	(0.0256)	(0.0474)	(0.0215)	(0.0145)	(0.0194)	(0.0154)
inc	−0.000153	4.75e-05	0.000143	−2.00e-05	−0.000283	5.09e-07	−1.60e-05	−1.20e-06	−3.03e-05	2.10e-06	−2.38e-05
	(0.000286)	(9.93e-05)	(0.000147)	(8.44e-05)	(0.000509)	(6.25e-05)	(0.000146)	(7.07e-05)	(5.04e-05)	(6.54e-05)	(5.15e-05)
Observations	271	271	271	242	271	269	271	271	271	271	271

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix Table 5

A description of the variable symbols.

Variable symbols in Appendix Tables 1 and 2		
Q271	Q27 Are the following determinants of your current home choice?	1. The Minato Mirai 21 Urban Development Basic Agreement is in operation.
Q272		2. Earthquake measures are promoted/Joint disaster prevention drills are conducted.
Q273		3. There are next-generation mobility initiatives using electric vehicles.
Q274		4. There is an environment-friendly district heating and cooling system.
Q275		5. Efforts are being made to improve the water environment and biodiversity.
Q276		6. Cleaning activities and greening measures are well done.
Q277		7. Community events are active.
Q278		8 Sightseeing facilities are substantial.
Q279		9. Area management is being promoted by the city of Yokohama.
Q2710		10 Companies are being attracted companies with cutting edge technology.
Q301	Q30 Do you think it would be good to communicate with people for the following via SNS or face-to-face?	1. Counseling about everyday small household chores
Q302		2. Movement when going out (pooling, etc.)
Q303		3. Help with everyday shopping
Q304		4. Help and consultation for family assistance and care
Q305		5. Help and consultation for childcare and childrearing
Q306		6. Health and illness consultation
Q307		7. Consultation for other concerns and worries
Q308		8. Exchange information about community events
Q309		9. Information exchange regarding hobbies and travel
Q3010		10. Work consultation and information exchange
Q311	Q31 Do you think that the following will deepen the connections between the residents of the community?	1. A trip to get acquainted with the local history, culture, nature, art, etc.
Q312		2. Volunteer activities such as cleaning
Q313		3. Planning and holding local events such as the autumn festival
Q314		4. Events such as athletic meet and excursions that can be enjoyed by parents and children
Q315		5. Building a salon where people can gather at any time
Q316		6. Inviting an instructor from outside or inside the community to study useful subjects
Q317		7. Conducting hobby-related and sports lectures by inviting outside or community instructors
Q318		8. Circle activities such as hobbies and sports
Q319		9. Preparation for disaster prevention and emergencies, training, etc.
Q3110		10. Regular dinner parties
Q32	Q32 What is your gender?	
Q331	Q33 What is your age?	
Q35	Q35 Please describe your type of residence.	
Q361	Q36 How many years have you lived in your current home?	
Q37	Q37 Do you want to continue living in your current area in the future?	
Q38	Q38 Are you married?	
family1	Family: couple only	

Appendix Table 5 (*continued*)

Variable symbols in Appendix Tables 1 and 2			
family2	Family: with parents		
family3	Family: with a college student or graduate		
family4	Family: with junior and senior high school students		
family5	Family: with elementary school students		
family6	Family: with preschoolers		
emp1	Occupation: self-employed		
emp2	Occupation: civil servant/teacher		
emp3	Occupation: temporary/part-time worker		
emp4	Occupation: student		
emp5	Occupation: unemployed		
emp6	Occupation: homemaker		
num	The number of family members living together		
inc	The income		
Variable symbols in Appendix Tables 1 and 2			
Q101	Q10 How often do you use your preferred SNS?	1. Facebook	5. Daily use
Q102		2. Twitter	5. Daily use
Q103		3. LINE	5. Daily use
Q104		4. Instagram	5. Daily use
Q105		5. Other	5. Daily use
Q271	Q27 Are the following determinants of your current home choice?	1. The Minato Mirai 21 Urban Development Basic Agreement is in operation.	
Q272		2. Earthquake measures are promoted/Joint disaster prevention drills are conducted.	
Q273		3. There is an environment-friendly district heating and cooling system.	
Q276		6. Cleaning activities and greening measures are well done.	
Q277		7. Community events are active.	
Q278		8. Sightseeing facilities are substantial.	
Q2815	Q28 Who do you search for on SNS?	1. Facebook	Friends for daily interactions
Q2817			Friends and acquaintances in the community
Q2825		2. Twitter	Friends for daily interactions
Q2827			Friends and acquaintances in the community
Q2835		3. LINE	Friends for daily interactions
Q2837			Friends and acquaintances in the community
Q2845		4. Instagram	Friends for daily interactions
Q2847			Friends and acquaintances in the community
Q2855		5. Other	Friends for daily interactions
Q2857			Friends and acquaintances in the community
Q291	Q29 How has using SNS been helpful for you?	1. I made close friends and contacts in the community.	
Q292		2. I made close friends and found counselors outside the community, such as for children's schools and workplaces.	
Q295		5. I deepened ties with family and friends.	
Q296		6. I can reconnect with people who have not been in contact for a while.	
Q297		7. I was able to connect with people I had never met before.	
Q298		8. I have stronger ties within the community.	
Q301	Q30 Do you think it would be good to communicate with people for the following via SNS or face-to-face?	1. Consultation for about everyday small household chores	
Q302		2. Discussion to go out together	
Q305		5. Help and consultation for childcare and childrearing	
Q306		6. Health and illness consultation	
Q307		7. Consultation for other concerns	
Q309		9. Information exchange regarding hobbies and travel	
Q311	Q31 Do you think that the following will deepen the connections between the residents of the community?	1. A trip to get acquainted with the local history, culture, nature, art, etc.	
Q312		2. Volunteer activities such as cleaning	
Q313		3. Planning and holding local events such as the autumn festival	
Q314		4. Events such as athletic meet and excursions that can be enjoyed by parents and children	
Q317		7. Conducting hobby-related and sports lectures by inviting outside or community instructors	
Q3110		10. Regular dinner parties	
Q331	Q33 What is your age?		

Appendix Table 5 (*continued*)

Variable symbols in Appendix Tables 1 and 2	
Q35	Q35 Please describe the type of your residence.
Q361	Q36 How many years have you lived in your current home?
family1	Family: couple only
family2	Family: with parents
family3	Family: with a college student or graduate
family4	Family: with junior and senior high school students
family5	Family: with elementary school students
family6	Family: with preschoolers
emp1	Occupation: self-employed or helped
emp2	Occupation: civil servant/teacher
emp3	Occupation: temporary/part-time worker
emp4	Occupation: student
emp5	Occupation: unemployed
emp6	Occupation: homemaker
num	The number of family members living together

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