

# Measurement of Social Capital at School and Neighborhood among Young People

Minoru Takakura\*, Yuiko Hamabata\*\*, Masaru Ueji\*\*\* and Atsushi Kurihara\*\*\*\*

\*Faculty of Medicine, University of the Ryukyus  
Uehara 207, Nishihara, Okinawa 903-0215 Japan  
minoru@med.u-ryukyu.ac.jp

\*\*Graduate School of Health Sciences, University of the Ryukyus  
Uehara 207, Nishihara, Okinawa 903-0215 Japan

\*\*\*Faculty of Education, Ibaraki University  
2-1-1 Bunkyo, Mito, Ibaraki 310-8512 Japan

\*\*\*\*Faculty of Education, Saga University  
1 Honjo, Saga-city, Saga 840-8502 Japan

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**Background:** Although most studies on social capital and health relate to adults, there is currently an increased number of studies focusing on young people. Most previous studies on social capital and health among young people have assessed social capital in residential communities, and may have thought little of that in schools. Moreover, measures to assess social capital among young people have been little verified their psychometric properties. This study thus aimed to develop self-rating scales of social capital at school and neighborhood among young people and to evaluate psychometric properties of the scales.

**Methods:** Self-administered questionnaires were distributed to 1,362 students in grades 10-12 at six public high schools across Ibaraki, Saga, and Okinawa prefecture, Japan in 2011. As for questionnaire items of social capital, we selected seven items of cognitive social capital at school, five items of cognitive social capital at neighborhood, and each one item of structural social capital at school and neighborhood. Reliability analyses included internal consistency and test-retest stability. Factor analysis was used to evaluate the construct validity of the cognitive measures. Criterion-related validity was examined the associations with safety at school and neighborhood and health indicators, such as self-rated health, depressive symptoms, and physical activities.

**Results:** Factor analysis showed that cognitive social capital constructs among young people comprised of cognitive social capital at school, which included trust and reciprocity within students and trust in teachers, and cognitive social capital at neighborhood, which included trust and reciprocity within neighbors. The internal consistency of the scale was good (Cronbach's alpha = 0.92-0.94), and its stability was also adequate (test-retest reliability = 0.48-0.81). As was expected, the cognitive social capital scales were associated with safety at school and neighborhood and some health indicators, indicating acceptable criterion-related validity. Only the structural social capital scale at school was associated with physical activity, while the structural social capital at neighborhood was with safety at neighborhood.

**Conclusions:** Psychometric evaluation of most measurement of social capital among young people indicated adequate validity and reliability. However, the validity of the structural social capital scale was inconclusive.

**Keywords:** psychometric scale, validity, reliability

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## I. Introduction

Social capital has been considered as a potential social determinant of health, and there is currently an upsurge of interest in studying the relationships between social capital and health<sup>1)</sup>. Although different definitions of social capital have been proposed, most of them generally define it as “resources composed of or derived from trust, and/or norms, and/or networks, which facilitate collective actions”<sup>2)</sup>. Social capital includes structural components such as network and social participation, and cognitive components such as trust and norms<sup>3)</sup>, and these two components in terms of social relations are about what people “do” and what people “feel”, respectively<sup>4)</sup>. Moreover, those are measured both as individual attribute and/or a group attribute<sup>1)</sup>.

High levels of social capital in society may influence health-related behaviors by promoting rapid diffusion of health information, increasing adoption of healthy behavioral norms, and exerting social control over deviant behaviors<sup>5)</sup>. Furthermore, it has been considered to act as a buffer to social disparity in health<sup>6)</sup>. These hypotheses may be applicable to young people group. In recent years, there is an increased number of studies on social capital and health related to the young people<sup>7)</sup>. Yet, there are some key issues still remaining in the measurement of social capital among young people as described below.

First, the issue of cultural and background differences. Social capital may differ between different cultures and social backgrounds<sup>8)</sup>. The social capital components of Japanese youth may not be appropriate in other countries, and vice versa. Further empirical research is needed to adapt the region and culture differences on the relationships between social capital and health.

Second, the issue of rating scale measurement. Single-item question is commonly to measure social capital in many studies<sup>9)</sup>. The use of single-item questions in many cases may not necessarily demonstrate statistical robustness, and the use of theoretically and statistically constructed synthetic indicators thus have been suggested<sup>10) 11)</sup>. Some scales assessed the psychometric properties on adult populations<sup>8) 9)</sup>. Regarding young people, a psychometric evaluation on social capital scale has been only developed by Almgren et al.<sup>12)</sup>, and it could not be found in other studies<sup>13-18)</sup>.

Third, the issue of raters. Many of the previous studies obtained social capital responses from existing macro statistics or through adults’ perceptions such as parents, local residents, and teachers. These problems can eventually cause young people’s responses being filtered through the interpretations of adults’ perspectives, and their exact responses could not be accurately assessed<sup>19-21)</sup>. More research on young people’s perspectives is thus needed<sup>22) 23)</sup>.

Fourth, the issue of target groups/areas. Geographically-defined groups have been used on adult’s social capital and health studies, whilst community context with its social space such as school and neighborhood might be more appropriate on young people for accurately reflecting what is happening with their daily life and health<sup>24)</sup>. School, where young people spend most of their daytime hours by involving in school activities and interaction with friends and teachers, is an important community for constructing social relations in young people<sup>25)</sup>. Hence, school has strong influence on youth’s behavior and attitudes<sup>26)</sup>, as well as their health outcomes<sup>27)</sup>. However, most previous studies on social capital and youth health have assessed social capital in residential communities<sup>19) 23)</sup>, and may have thought little of that in schools<sup>21)</sup>.

Taken together, an adequate methodology is needed to elaborate associations between social capital and health among Japanese youth. The aim of the present study was thus to develop a self-rating scale for measuring social capital among young people and to evaluate the reliability and validity of the scale.

In this study, we defined social capital as “trust, norms such as reciprocity, and network in the society” and distinguished cognitive components from structural components<sup>2)</sup>. School and neighborhood were then assessed as reference groups. As reflection of the diversity of social capital concepts, some intermediate variables in the middle of social capital and health outcome, including sense of belonging, enjoyment of area, neighborhood quality (noise, litter, graffiti, etc.), crime, and security, have been sometimes regarded as social capital<sup>3)</sup>. Correspondingly, social control and social support have been considered not only as social capital but also the outcome of social capital<sup>3) 28)</sup>. In the present study, conceptually ambiguous variables such as the intermediate variables or the outcome variables were carefully excluded from social capital items<sup>29)</sup>.

## II. Methods

### 1. Participants and study procedure

This study was performed with a convenience sample of 1,362 students in grades 10 through 12 (ages 15-18 years) enrolled in six high schools in Ibaraki, Saga, and Okinawa prefecture, Japan, including one general high school and one vocational high school from each prefecture. The schools were intentionally chosen from the research fields of the authors. The selected vocational high schools were a technical high school and two commercial high schools. The study sample for further analyses consisted of 1,241 respondents (45% males, 55% females; 34% 10th grade, 32% 11th grade, 34% 12th grade; 31% Ibaraki, 36% Saga, 33% Okinawa; and 53% general high school, 47% vocational high school), excluding who were absent from school when the survey was conducted (54 students), declining their participation on the survey (63 students), and with no gender information (4 students). To examine the stability of scales, follow-up survey was conducted two weeks apart to 118 unidentified respondents from a school other than described above.

Using written instructions provided by researchers, classroom teachers conducted a self-administered anonymous questionnaire in class from June to July 2011 (survey was also conducted in September 2011 at one school as per requested convenient time). After being informed about the nature and intent of the study, both in writing and verbally, all students attending the class were requested to complete and return the questionnaire sealed in an unmarked

envelope. Students were free to decline participation.

The study protocol was approved by the Institutional Review Board on Epidemiological Research Ethics of University of the Ryukyus.

### 2. Measures

On the basis of previous studies<sup>7) 13-18)</sup>, we developed the question items to indicate cognitive and structural components of social capital. Cognitive social capital at school such as trust and reciprocity in students and teachers (**Table 1, x1-x7**), as well as in their neighbors at neighborhood (**Table 1, x8-x12**) were assessed using a five-point rating scale, from “strongly agree” to “strongly disagree”. Structural social capital was measured based on social participation, particularly participation in organized activities<sup>30-32)</sup>. The frequency of participation was rated on six-point scale, from “not involved” to “7 days per week”, including organized activities at school such as student council, sports- and cultural-based extracurricular activities, and others, as well as organized activities at neighborhood such as youth association, sports club, culture/learning circle, music circle, volunteer activity, Boy Scouts/Girl Scouts, YMCA/YWCA, elementary school or junior high school alumni associations, family gathering, and others. In the present study, since the participation rate in organized activities of respondents was very low, and in order to assess the presence or absence of social participation in the same way of previous studies<sup>11) 33)</sup>, a dichotomized dummy variable for each structural social capital at school and neighborhood was then created, taking point 1 if the respondents were participated in any organized activities, and 0

**Table 1** Descriptive statistics and factor analysis of cognitive social capital items

		Mean	S.D.	Skewness	Kurtosis	Factor loadings		
						1	2	
x2	Students in my school are kind and dependable	私の学校の生徒は、親切でたよりになる	3.7	1.0	-7	.5	<b>.943</b>	-0.068
x3	Students in my school help each other	私の学校の生徒は、お互いに助け合う	3.8	.9	-7	.5	<b>.910</b>	-0.068
x1	Students in my school can be trusted	私の学校の生徒は、信頼できる	3.6	1.0	-7	.3	<b>.889</b>	-0.021
x4	Students in my school usually try to be helpful	私の学校の生徒は、多くの場合、他の人の役に立とうとする	3.4	1.0	-5	.0	<b>.839</b>	.022
x5	Students in my school understand each other	私の学校の生徒は、お互いに理解している	3.4	1.0	-3	-1	<b>.816</b>	.012
x7	Teachers in my school are kind and dependable	私の学校の先生は、親切でたよりになる	3.3	1.0	-5	.1	<b>.482</b>	.167
x6	Teachers in my school can be trusted	私の学校の先生は、信頼できる	3.3	1.0	-5	-1	<b>.481</b>	.165
x11	The neighbors help each other	近所の人々は、お互いに助け合っている	3.4	1.0	-5	.3	-0.025	<b>.917</b>
x10	The neighbors usually try to be helpful	近所の人々は、多くの場合、他の人の役に立とうとする	3.2	1.0	-2	.2	.002	<b>.877</b>
x9	The neighbors are kind and dependable	近所の人々は、親切でたよりになる	3.2	1.0	-4	.1	.030	<b>.852</b>
x12	The neighbors get along with each other	近所の人々は、お互いにうまくいっている	3.4	1.0	-5	.3	.006	<b>.832</b>
x8	The neighbors can be trusted	近所の人々は、信頼できる	3.3	1.0	-4	.2	.048	<b>.809</b>
Eigen value							5.7	2.4
Percentage of contribution							47.7	20.4

Bold value represents factor loading more than 0.4

otherwise<sup>11)33)</sup>.

Self-rated health, depressive symptoms, and physical activities, as well as safety at school and neighborhood were used in assessment of criterion-related validity that is predictive and concurrent validity of the social capital scales. In the field of social epidemiology, social capital has been discussed as a potential determinant of health<sup>1)</sup>. Since previous studies suggested that social capital has been linked to health and health-related behaviors, such as self-rated health<sup>11)12)18)</sup>, depressive symptoms<sup>17)</sup>, and physical activities<sup>13)20)</sup>, we thus used these health indicators as the external criteria of predictive validity. As aforementioned, safety at school and neighborhood has been considered as intermediate variables in the middle of social capital and health outcome and sometimes as social capital variables<sup>3)</sup>. Thus, we adapted these safety variables as the external criteria of concurrent validity. Self-rated health was evaluated using a four-point rating scale, i.e. “excellent”, “good”, “fair”, and “poor”, to the question “how would you describe your current state of health?”. Depressive symptoms were assessed using Japanese version of the Center for Epidemiologic Studies Depression Scale<sup>34)35)</sup>. Physical activity was assessed using questions adapted from Patient-centered Assessment and Counseling for Exercise plus Nutrition, and was classified into “active group (1)” and “inactive group (0)” as a dummy variable<sup>36)37)</sup>. Safety at school and neighborhood were evaluated using a five-point rating scale, from “strongly agree” to “strongly disagree” to the statement “I feel safe at school” and “I feel safe at neighborhood”. Although we assessed it with a question intended to capture a global perception of safety at school and neighborhood, Samdal et al.<sup>38)</sup> also measured safety at school through a single item and found that school safety was strongly related to student satisfaction with school. Similarly, Duncan et al.<sup>39)</sup> surveyed neighborhood safety by a single question and found that neighborhood safety was associated with beliefs about gang activities and witnessed violence, suggesting the validity of perceived neighborhood safety.

### 3. Data analysis

To verify the factorial validity of cognitive social capital scale, those items were evaluated using factor analysis (maximum likelihood method and promax

rotation). The number of factors extracted was two as for the two components at school and neighborhood.

The concurrent validity of social capital was examined from the association between social capital and intermediate variable items of safety at school and neighborhood. Predictive validity was then assessed by the associations between social capital and self-rated health, depressive symptoms, and physical activity. All relations were analyzed with Spearman's rank correlation coefficient ( $\rho$ ). The reliability of the scale was evaluated using internal consistency (Cronbach's  $\alpha$  coefficient) and test-retest stability ( $\rho$ ). The statistical significance level was at 0.1%.

### III. Results

Means, standard deviations, kurtosis, and skewness of cognitive social capital are shown in **Table 1**. These descriptive statistics indicated that the distributions of the item scores were not biased. Moreover, the histograms were found in unimodal shape (data not shown). Meanwhile, the mean, standard deviation, skewness, and kurtosis values of structural social capital at school were 0.67, 0.47, -0.7, and -1.5, respectively, whilst at neighborhood, the values were 0.36, 0.48, 0.6, and -1.7 respectively. **Table 1** concurrently shows the results of factor analysis. From the factor loadings, the first factor was then interpreted as cognitive social capital at school and the second factor as cognitive social capital at neighborhood.

Given the above findings, we developed cognitive social capital at school scale which is composed of seven items, as well as cognitive social capital at neighborhood which is composed of five items. **Table 2** shows the descriptive statistics of the scale scores and variables as appropriateness criteria, as well as Cronbach's  $\alpha$  coefficients and test-retest reliability coefficients of the scale scores. The  $\alpha$  coefficients of each scale were 0.92 to 0.94 and the test-retest reliability coefficients were 0.48 to 0.81. There were no gender and school type differences in the scale scores of cognitive social capital at school and neighborhood. Males and vocational high school students reported higher scores of structural social capital at school than females and general high school students (0.74, 0.72 vs. 0.62, 0.63, respectively), whereas females and general high school students reported higher scores on structural social capital at

neighborhood than males and vocational high school students (0.38, 0.38 vs. 0.33, 0.33, respectively).

As for the concurrent validity, we recognized associations between each social capital scale and safety question as the expected directions (**Table 3**). Cognitive social capital at school was positively associated with safety at school ( $\rho=0.63$ ), and the same relation was also observed for neighborhood setting (0.51). Structural social capital at neighborhood had weak positive associations with safety at neighborhood (0.11).

**Table 3** also shows the associations between social capital scales and health indicators. Regarding cognitive social capital, thoroughly, positive associations were found at both school and neighborhood settings for self-rated health and physical activity (0.18 to 0.31 and 0.15 to 0.16, respectively), while it had negative correlations with depressive symptoms (-0.25 to -0.39). Of the structural social capital, only physical activities at school setting had a positive correlation at 0.37.

#### IV. Discussion

The present study developed self-rating scales of social capital at school and neighborhood, where are regarded as the important community for youth, and evaluated the psychosomatic properties of the scales. As a result, high internal consistency of each scale with more than 0.9 of  $\alpha$  coefficients and adequate stability with 0.48 to 0.81 of test-retest reliability coefficients were confirmed. In addition, the concurrent and predictive validity of cognitive social capital tested was directive relevance and generally acceptable, but those of structural social capital at school and neighborhood were not mostly supported because only a few associations with external criteria of validity were observed.

There are a few studies in social capital-related psychometric evaluation focusing on young people. The only previous study of Almgren et al.<sup>12)</sup> developed, using principal component analysis, social capital scales comprised of “positive school affiliation”, “safe learning environment”, “social network cohesion”, and “parents having knowledge

**Table 2** Social capital scale scores, alpha coefficients, and test-retest reliability coefficients

	Mean	S.D.	Range	Alpha	Retest
Cognitive social capital at school	24.4	5.7	7 - 35	.919	.669
Cognitive social capital at neighborhood	16.6	4.4	5 - 25	.936	.808
Structural social capital at school	.7	.5	0 - 1	-	.606
Structural social capital at neighborhood	.4	.5	0 - 1	-	.483
External criteria for validity					
Safety at school	3.3	1.2	1 - 5		
Safety at neighborhood	3.6	1.0	1 - 5		
Self-rated health	3.1	.7	1 - 4		
Depressive symptoms	38.1	9.0	20 - 77		
Physical activity	.3	.5	0 - 1		

**Table 3** Relationships between social capital and safety at school and neighborhood and health indicators (Spearman's  $\rho$ )

	Concurrent validity		Predictive validity		
	Safety at school	Safety at neighborhood	Self-rated health	Depressive symptoms	Physical activities
Cognitive social capital at school	.633*	.263*	.308*	-.390**	.159*
Cognitive social capital at neighborhood	.296*	.507*	.182*	-.245**	.152*
Structural social capital at school	.089	.068	.004	-.066	.373*
Structural social capital at neighborhood	.079	.112*	.046	-.066	.050

\*:  $p<0.001$

of friends' plans". However, as those include subscales regarded as intermediate variables and subscales with a low internal consistency, it does not seem to be common scales. Morgan & Haglund<sup>13)</sup> assessed sense of belonging, autonomy and control, and social networking of young people in family, school, and neighborhood settings as part of the WHO Health Behaviour in School-aged Children study (HBSC), while Boyce et al.<sup>14)</sup> and Elgar et al.<sup>15)</sup> created cognitive social capital measurements at neighborhood using HBSC data. Furthermore, Khawaja et al.<sup>16)</sup>, Aslund, Starrin, & Nilsson<sup>17)</sup>, and Borges et al.<sup>18)</sup> developed various social capital scales at neighborhood setting, but their results excluding various essential psychometric evaluations such as factorial validity, or including intermediate variables and outcome variables in the scale items, following ambiguous constructs. Hence, the present study strived to measure with narrowing down to trust, reciprocity, and network at school and neighborhood, chipping off previous ambiguous concepts.

As for the result of factor analysis, the cognitive social capital was divided into two constructs, namely, cognitive social capital at school and neighborhood. The scale items could capture cognitive social capital constructs at school, including trust and reciprocity within students and trust toward teachers, as well as cognitive social capital at neighborhood, including trust and reciprocity within neighbors, which are typical cognitive social capital concepts in the theory of social capital<sup>40)</sup>. Of the structural social capital, the degree of social networks based on presence or absence of social participation in organized activities were assessed. It is important to distinguish the cognitive social capital from structural social capital because these two components have different associations with health outcomes<sup>3)</sup>.

The present study demonstrated positive correlations between most of social capital variables and safety variables at both school and neighborhood settings, and partly confirmed concurrent validity of the social capital scales. These results were in line with the study of Asakura<sup>41)</sup> who reported that neighborhood safety was associated with individual cognitive social capital in junior high school students. Safety at school and neighborhood are considered as intermediate variables of social capital<sup>3)</sup>, so it could be reasoned that higher levels of social capital at school and neighborhood can increase safety at both settings.

Although the strength of correlations might vary depending on health indicators tested, the predictive validity for health indicators of cognitive social capital scales was sufficient and directive relevance. In agreement with previous studies<sup>42-44)</sup>, the cognitive social capital had stronger and more consistent associations with self-rated health and depressive symptoms compared to that of structural social capital. Students who had higher levels of cognitive social capital at school and neighborhood were more likely to be physically active. This finding was consistent with previous studies that have demonstrated that students' perceptions of cognitive social capital at neighborhood were associated with their physical activities<sup>20)</sup>, as well as their parents' perceptions about them<sup>45)</sup>. Structural social capital at school was positively associated with physical activity, suggesting the influence of participation in sports-based extracurricular activities.

Recently, researchers have emphasized the importance of Internet-based linkages such as online social network sites, which serve as the foundation of social capital<sup>46)</sup>. Previous studies showed that the usage of Facebook, a popular social network site among young people, was positively associated with the amount of social capital<sup>46)47)</sup>. In addition, Facebook use was found to interact with psychological well-being, suggesting greater benefits for users with low self-esteem and low life satisfaction<sup>46)</sup>. On the other hand, some studies showed that online harassment such as spreading of rumors and sexual solicitation was relatively frequent among adolescents<sup>48)</sup>. It was also pointed out that social network site usage might cause a variety of negative consequences that imply the decrease in real-life community involvement and worse academic performance, as well as relationship problems<sup>49)</sup>. Thus, online social network sites may have both the benefit and harm aspects. Although the present study did not address online social media issues, further research is needed to focus on the relevance of online social media as a resource of social capital.

In conclusion, the present study provided adequate reliability evidence of the measurement of social capital among young people. Moreover, the validity of cognitive social capital scale was also acceptable, but that of structural social capital scale was inconclusive. Further development is still required for standardized psychometric scale with a larger population.

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**Name:**  
Minoru Takakura

**Affiliation:**  
Faculty of Medicine, University of the Ryukyus

**Address:**  
Uehara 207, Nishihara, Okinawa 903-0215 Japan

**Brief Biographical History:**

2005 Professor, Faculty of Medicine, University of the Ryukyus  
2010 Dean, Graduate School of Health Sciences, University of the Ryukyus

**Main Works:**

- Takakura M. Does social trust at school affect students' smoking and drinking behavior in Japan? *Social Science & Medicine* 72:299-306, 2011
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**Membership in Learned Societies:**

- Japanese Association of School Health
  - Japanese Society of Health Education and Promotion
  - Japan Epidemiological Association
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