

The Effect of Key Competencies on Social Capital: Social Outcomes of Learning in Japan

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ABSTRACT

This study attempted to determine the social outcomes of learning by examining the relationship between key competencies and social capital. A questionnaire was completed by 3,575 participants aged 20–79 years from various areas of Japan. Items on the questionnaire focused on attributes such as homeownership, education level, income, interactions, and trust. The results indicated that (1) learning factors (i.e., sense of lifelong learning, key competencies) had an effect on fostering social capital; (2) key competencies could potentially minimize the negative relationship between economic conditions and social isolation; and (3) regardless of community, the social outcomes of learning were nearly identical.

KEYWORDS

Social Capital
Human Capital
Key competency
Learning

1 Introduction

This study attempts to determine the social outcomes of learning by examining the relationship between key competencies and social capital. International discussions of learning outcomes have generally focused on economic performance in the context of human capital theory (Becker 1994). In this theoretical context, it is assumed that learning under formal education expands human capital (e.g., knowledge, skills, qualifications), which in turn boosts profits and economic growth. However, by 2000 the Organization for Economic Co-operation and Development (OECD) had proposed a shift away from learning outcomes based on economic gains to those with a social focus. Interest in social capital, health, and well-being in addition to knowledge, skills, and qualifications consequently intensified among researchers and policymakers (OECD 2007a).

In Japan specifically, individuals began to focus greater attention on social capital following

the East Japan Great Earthquake Disaster. Indeed, verifying the determinants of social capital from an educational/learning perspective is of great importance; accordingly, this research investigates social capital (Putnam, Leonardi, & Nanetti 1993; Putnam 2001) as a social outcome of learning.

In prior research, social capital has generally been taken as an exogenous variable. Since Coleman (1988), studies focusing on social capital's effects on human capital have increased. Nevertheless, research wherein social capital is an endogenous variable remains sparse. Likewise, with the exceptions of Feinstein and Hammond (2004), Tuijnman and Boudard (2001), and Field (2005), studies that verify the effect of learning on social capital are few. In research in which learning factors are set as an explanatory variable of social capital, educational qualification is frequently treated as a control variable. To generate social capital, people should recognize the importance of building ties through learning and possess the ability to build such ties. Hence, in the present study educational qualifications, sense of lifelong learning (Field 2005), and key competencies (Rychen & Salganik 2003) are set as learning factors.

2 Economic Outcomes and Social Outcomes of Learning

2.1 Human Capital

Japan has continued to invest huge amounts in the education/learning sector, including homes, schools, and communities. As a result, the level of human capital (e.g., knowledge, skills) has reached the top levels in the world. For example, reading and science were ranked fourth in the *Programme of International Student Assessment 2012* (PISA 2013). However, we should keep in mind that all the upper-ranked areas are small countries (or local governments in a country) such as Shanghai, Hong Kong, and Singapore.

In addition, literacy and numeracy were ranked highest of 24 countries in the *Programme for the International Assessment of Adult Competencies 2012* (PIAAC 2012), which addresses the academic achievements of adults. The high academic achievement level of adults in Japan is demonstrated by the following survey results. Non-graduate upper secondary education in Japan had higher literacy scores than graduate upper secondary education in Germany and the United States. In addition, low-skilled workers in Japan had higher literacy scores than semi-skilled workers in Germany and the United States (National Institute for Education Policy and Research 2013). We can interpret this as showing that the learning system in Japan has significant effects on fostering human capital, such as knowledge and skills. Does the learning system in Japan have an effect on other aspects of social performance besides human capital?

As described previously, OECD has been interested in the social outcomes of learning, and insists on the significance of verifying the effect of learning on social outcomes, such as social capital, health, and well-being. Since so much economic capital is invested in the education/learning system, many people are naturally interested in the results of the education/learning. International achievement tests, such as PISA and PIAAC, are outcome indicators of learning that are easy for people to understand. Therefore, many national

governments are interested in these test results to ensure accountability to their citizens. However, people do not learn solely to acquire knowledge, skills, and qualification. In Japanese society, educational purposes such as fostering rich ties with others and living healthy and happy lives are included in the formal and informal education system. If we intend to explain the outcomes of economic capital inputs in learning, we have to focus on the social outcomes of learning, such as social capital, health, and well-being. Therefore, we think that the Japanese government must ensure greater accountability than other countries in addition to verifying the effect of learning on social outcomes. The question then arises of the degree to which the social outcomes of learning in Japan have been achieved.

2.2 Social Capital, Health, and Well-being

In order to understand the actual situation of children's social capital and health, the report data of UNICEF Innocenti Research Institute will be helpful (UNICEF Innocenti Research Institute, Abe, & Takezawa, 2013). First we survey the situation of social capital of children. Appropriate indicators are as follows: On the "percentage of children who have received bullying," which focuses on the relationships among children, Japan ranked tenth out of 30 countries. On the "percentage of NEET (Not in Education, Employment or Training)," focusing on the relationship between children and society, Japan ranked tenth out of 30 countries. In addition, "child abuse mortality," focusing on the relationship between children and parents, Japan ranked sixth out of 28 countries. Social capital of children has become somewhat problematic compared to academic achievement.

On the other hand, the research report has the following three variables as indicators of children's health: "percentage of obese children" ranked 30th out of 30 countries, "percentage having breakfast every morning" ranked first out of 30 countries, and "teen pregnancy rate" ranked 28th out of 31 countries. The health of children in Japan as well as their academic achievement is in the top level of OECD countries.

UNICEF Innocenti Research Institute et.al. (2013) is an international survey that studied the well-being of Japanese children. The report measured children's well-being from five perspectives: material well-being, health and safety, education, behaviors and risks, and housing and environment. Children in Japan ranked sixth out of 31 countries, which is relatively high.

In order to understand the actual situation of adult's social capital, health, and well-being, OECD (2011) will be helpful. Indicators of social capital of adults are as follows: On "support by social networks (whether do you have family or friend that you can count on when you need it?)" Japan ranked 24th out of 40 countries, and tenth out of 36 countries on "confidence in the others (the percentage of people who responded that most people can be trusted)" and tenth out of 28 countries on "time for volunteer activities." In addition, on "vote rate" Japan ranked 23rd out of 39. This indicates that, based on international comparative data on adults' social capital, Japan has weaknesses in social networks and participation.

On the other hand, adult health indicators are as follows: On "expectation of life at birth" Japan ranked first out of 40 countries and fourth out of 40 countries on "adult obesity rate." The health level of Japanese adults is among the highest in the world.

Indicators of adult well-being are as follows: On “life satisfaction (the best life that may be thought is 10, the worst life that may be thought is 0),” Japan ranked 29th out of 40 countries and third out of 40 countries on “dominant emotion (the proportion of respondents who often experience positive rather than negative feelings the day before the survey).” Judging by “dominant emotion,” there are many people who experience a feeling of well-being in Japan.

2.3 Focus on Social Capital

International comparative data on the social outcomes of children and adults show multiple indicators of social capital needing improvement. Such problems as bullying, NEET, and child abuse are social issues related to the social capital of children, while poor social support and participation are related to the social capital of adults. We hypothesize that these problems related to social capital are affected by learning factors.

The present study focused on social capital as social outcomes of learning. Putnam, Leonardi & Nanetti (1993) define social capital as follows: “*Features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated action*” (p. 167). In general, recent studies of social capital have measured social capital with reference to trust, norms, and networks, as indicated by Putnam et al. (1993). Social capital is a concept that has gained international, interdisciplinary attention during roughly the last 30 years (e.g., Bourdieu 1986; Burt 1997; Coleman 1988; Kawachi, Subramanian, & Kim 2008; Lin 2008; Putnam et al. 1993; Putnam 2001; Woolcock & Narayan 2000).

The main interest of social capital research in the field of education is in the effects of social capital on human capital. Since Coleman (1988, 1990), the effects of social capital on human capital, such as academic achievement, university enrollment rates, and dropout suppression, have become the focus of social capital research in the field of education. (Anderson 2008; Croll 2004; Huang 2009; Gottfredson & DiPietro 2011; Ho Sui-Chu & Willms 1996; Louis & Marks 1998; Morgan & Sorensen 1999; Parcel & Dufur 2001; Payne, Gottfredson, & Gottfredson 2003; Pong 1998; Smith, Beaulieu, & Israel 1992; Sun 1998, 1999).

On the other hand, relatively little progress has been made in clarifying the determinants of social capital. Several studies have verified the effects of SES and residential mobility on adults’ social capital; however, only little research has taken social capital as an endogenous variable (e.g., Aston & McLanahan 1994; Bryk & Schneider 2002; Hofferth & Iceland 1998; Swanson & Schneider 1999). In the present study, we demonstrate the effects of learning factors on social capital, taking the effects of SES and residential mobility as control variables. This raises the question of what the effects of learning factors are on building social capital. The following section, in which the analysis model is constructed, discusses previous studies of learning factors that might affect social capital.

3 Learning Factors’ Effects on Social Capital

It would appear that the focus of educational research is changing from “the effect” to “how to

build" (OECD 2007a). Researchers have devoted great time and expense to clarify the significance and effects of social capital. The next stage might be called an exploratory stage on fostering the important capital of a given society. In this research, we examine the effects of learning on social capital based on OECD's viewpoint that learning fosters social capital. The present study assumes that the following three learning factors – educational qualifications, the experience and sense of lifelong learning, and key competencies – are suitable explanatory variables of social capital.

3.1 Educational Qualifications

Inaba (2007) carried out correlation analysis of the relationship between educational qualification and social capital with prefectural-level data (N = 47). The results yielded a negative correlation between educational qualification (the proportion of university or higher education) and social capital. On the other hand, a positive correlation was observed between educational qualifications (the proportion of high school education or less) and social capital. However, this result was obtained by simple bivariate correlation analysis, leaving open the possibility that different results would be obtained with partial correlation analysis that includes control variable such as population size, population density, financial index, university enrollment rates, and the average age of respondents. However, the result of this analysis has value in that it indicates that educational qualifications have some influence on social capital.

Recent years have seen an increase in the number of studies using individual data to demonstrate a relationship between educational qualification and social capital. For example, Yasuno (2014) analyzed the relationship between educational qualifications and social capital (social participation) with data from the sixth wave of the World Values Survey. His analysis clarified that compared to a reference point of "high school graduate," the participation rate of the "junior high school graduate" group is lower. In addition, the survey of Ishida (2015) demonstrates that educational qualifications (years of education) affect generalized trust and reciprocal norms but not neighborhood relationships.

On the other hand, Nagayoshi (2013) examined the effect of educational qualifications on social exclusion as a reverse aspect of social capital. His analysis demonstrates that educational qualifications have the effect of suppressing social inclusion ("I have never consulted anyone even trivially in the past year"). Sasaki (2014) has revealed that the level of generalized trust ("I can trust most people") of university graduates is higher than that of high school graduates. Misumi (2014) studied the effect of educational qualifications on social capital as measured from the three perspectives of generalized trust, generalized reciprocity, and tolerance. As a result, it was revealed that educational qualifications (years of education) have a positive effect on generalized trust and tolerance but not on generalized reciprocity.

This research obtained characteristic results on the relationship between educational qualifications and social capital. The relationship between the two factors is positive when analyzing individual-level data but negative using community-level data.

3.2 Experience and Sense of Lifelong Learning

Certainly, educational qualifications are the most popular explanatory variable when

analyzing the effects of learning on social capital. However, “educational qualifications” refers to the number of years in educational institutions or the degree acquired around age 20 under a formal education system. While educational qualifications illuminate part of a person’s learning experience, it is not sufficient to encapsulate learning experiences after reaching adulthood.

Tuijnman & Boudard (2001) investigated the relationship between the participation rate in adult lifelong learning and social capital (civic participation and generalized trust as alternative indicators) using international adult literacy survey data for 17 Western European countries. Their analysis revealed that if a nation’s adult learning participation rate is high, the participation rate in voluntary organizations and the level of generalized trust in others is also high.

Feinstein & Hammond (2004) used an analysis model in which the amount of participation in learning courses during 10 years of adulthood (33–42 years) was set as an explanatory variable of social capital, for which aspects of citizen participation (political interest, participation in civic activities, and voting) were the dependent variables serving as alternative indices of social capital. They analyzed the effect of participation in learning courses on social capital (civic participation) through control variables such as educational qualifications, occupational status, and SES. The analysis shows that participation in learning courses has a positive effect on the three indices of social capital. The study thus yields the interesting result that lifelong experiences in adulthood have positive effects on building social capital.

Mitsubishi Research Institute (2011) is a study in which both educational qualification and lifelong learning experience are explanatory variables of social capital. The survey target age is 30–49. This study used multi-level modeling (individual-level and prefecture-level) in which social capital (bonding social capital and bridging social capital) is a dependent variable. The analysis revealed that both educational qualifications (“university and graduate school”) and lifelong learning experience (“degree of implementation of learning that will help to skill up oneself”) have positive effects on bridging social capital. Previously acquired educational qualifications and current learning activities for professional growth have the effect of expanding social capital. Furthermore, lifelong learning factors such as “degree of implementation of school support activities within one’s own community” and “degree of implementation of learning activities by utilizing lifelong learning facilities within one’s own community” have positive effects on both bonding and bridging social capital. However, note that the study revealed significant individual-level effects but not prefectural-level effects on social capital.

On the other hand, Field (2005) examined the effects of a sense of lifelong learning on social capital (social participation willingness as an alternative indicator) in a survey of the UK. To the statement, “people will be better citizens through continued learning,” 66.7% of respondents answered that it is “important” to participate in their own community and 54.5% answered “not important.” The group who answered “important” about participating in cultural events, their own church, and sports gave more positive responses to the statement that “people will be better citizens through continued learning.”

Measurement of lifelong learning experience has been implemented for a limited age group (30–40 years old), as in Feinstein & Hammond (2004) and Mitsubishi Research Institution (2011). The research targets of these surveys are fundamentally of working age. However, this study

surveyed a wide range of adults aged 20–79 years, as described below, which presents the risk that lifelong learning experience has been inordinately affected by age and employment status. We thought it better to set “sense of lifelong learning” as one of the learning factors rather than “experience of lifelong learning” as in Field (2005).

3.3 Key Competencies

As mentioned previously, preceding studies have focused on educational qualifications or experience of lifelong learning as explanatory factors of social capital. These variables focus on the quantitative aspects of the learning experience but do not touch on qualitative aspects of learning experience, such as concrete value/sense or competency acquired through various educational opportunities. The concepts of adult abilities are diverse. Therefore, it is a very difficult task to specify and measure the abilities of adults. However, inspired by the DeSeCo (Definition and Selection of Competencies: Theoretical and Conceptual Foundations) Project, the competency concept of adults was recently clarified and a common understanding has been reached on the international level (OECD, 2005; Rychen & Salganik 2003). The DeSeCo Project focused on the three important competencies of Using Tools Interactively, Interacting in Heterogeneous Groups, and Acting Autonomously to realize the “quality of life” and “well-functioning society.”

Key competency theory was included in the project from the perspective of the building effects of social capital (social network) in addition to economic growth effects by facilitating key competencies. As this is a concept that has gained international consensus, we consider key competencies useful as indicators of adult learning factors. We will examine key competencies as a qualitative aspect of learning experience, in addition to educational qualifications and the degree of participation in lifelong learning courses as quantitative aspects of the effects of learning experiences on social capital.

4 Research Questions

The following three research questions will be examined by focusing on educational qualifications, a sense of lifelong learning, and key competencies as learning factors that have an effect on building social capital.

4.1 Direct Effects of Learning Factors on Social Capital

The first research question is to reveal the direct effects of three learning factors (educational qualification, sense of lifelong learning, and key competencies) on social capital. The present study was designed to compare the effects among learning factor variables and the effects of individual-level and community-level factors on social capital. In previous studies, analysis focused on one learning factor, as did analytical models comparing individual and community-level effects. Previous studies emphasized the effect of quantitative aspects of the learning experience (educational qualifications). However, the qualitative aspects of learning experience

(value and ability) might be more effective in building social capital.

Is the building of social capital determined by learning variables on the individual or community level? The possibility is considered that one person's social capital might increase by living in a community where the level of learning factors is high even though the individual-level learning factors are not high. When discussing the explanatory factor of social capital, it is important to include community-level factors in the model in addition to individual-level factors to avoid statistical fallacies.

4.2 Adjustment Effect of Learning Factors in the Relationship between Economic Situation and Social Capital

The second research question is to reveal the adjustment effect of learning factors on the relationship between economic conditions and social capital. The formal education system has been expected to suppress re-production phenomena. We believe that an adjustment effect of learning factors functions in the relationship between economic hierarchy and social capital. If one person has a low education background, a low sense of lifelong learning, or low key competencies, a low income level would lead to social isolation. On the other hand, another person for whom these learning factors are high, even in a low income level, this would be unlikely to lead to social isolation. The adjustment effect of economic inequity by learning factors would occur also at the community level. If one community has an average low level of learning factors, low economic conditions at the community level would lead to social isolation.

4.3 Community-level Differences in the Effect of Learning Factors on Social Capital

The third research question is to reveal the community-level differences in the direct effects of learning factors on social capital. Is the effect of learning factors on social capital similar or different between communities? If the effect of learning factors on social capital has commonalities between communities, it may be expected that learning factors related to the formal and informal education system would yield high performance in any community in country. However, if diverse effects on building social capital are observed, we would need to work to clarify the characteristics of a community showing a high incidence of the effect. Therefore, to discover the institutional and policy implications of research findings, we should check the difference or variance in the effect between communities.

4.4 Research Questions in this Study

Based on the aforementioned, the following three research questions are posed:

- RQ1. Do learning factors have an effect on social capital? If so, is the effect quantitative (i.e., years of education) or qualitative (i.e., sense of lifelong learning and key competencies)?
- RQ2. Do learning factors have an adjustment effect on the relationship between economic conditions and social capital? If learning factors have a low-level effect, poverty should lead to social isolation. However, if learning factors have a high-level effect, they

should minimize the relationship between poverty and social isolation.

RQ3. Do any differences exist between communities that directly affect the influence of learning factors on social capital?

5 Method

5.1 Data Collection

Data were obtained from the *Security, Trust, and Social Participation of the Living Questionnaire* (Grant-in-Aid for Scientific Research 24243040), which was conducted between October 10 and November 8, 2013. The questionnaire received approval from the Nippon University Ethical Review Board, and was implemented by Japan's Central Research Service. The survey targeted 10,000 people aged 20–79 years selected randomly from the Basic Resident Register, which comprises 100 different areas. A two-stage random sampling mailing method was employed; the number of returned and valid questionnaires was 3,575, for a 35.8% response rate. The respondents' demographics are provided in **Table 1**.

Table 1. Respondents' Attributes

		N	MEAN	SD	COMPOSITION RATE (%)
SEX	Male	1,628			45.5
	Female	1,947			54.5
AGE		3,575	53.5	15.8	
OCCUPATION	Self-employed	341			9.5
	Manager	87			2.4
	Regular employee	820			22.9
	Temporary staff	195			5.5
	Public officials	168			4.7
	Part-time worker	536			15.0
	Student	61			1.7
	Unemployed	588			16.4
	Full-time housewife/husband	594			16.6
	Others	94			2.6
RESIDENCE FORM	Own house	2,747			76.8
	Rented house	721			20.2
RESIDENCE YEARS		3,484	25.5	18.6	
HOUSEMATE	Alone	346			9.7
	Some housemate	3,155			88.3
EDUCATIONAL QUALIFICATION	Junior high school or less	375			10.5
	High school	1,438			40.2
	Advanced vocational school	407			11.4
	Junior college	383			10.7
	University	844			23.6
	Graduate school	81			2.3
HOUSEHOLD INCOME (million yen)	Less than 200	354			9.9
	200–400	1,051			29.4
	400–600	816			22.8
	600–800	497			13.9
	800–1,000	329			9.2
	1,000–1,200	147			4.1
	More than 1,200	145			4.1

Table 2. Questionnaire Items

<i>Items</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Scale</i>	<i>Component Score</i>
Dialogue and Interaction					
The degree of interaction with the neighborhood	3,552	3.73	.77	Daily (5), Frequently (4), Sometimes (3), Rarely (2), Absolutely none (1)	.82
Frequency of socializing with friends and acquaintances	3,546	3.45	.94	Daily (5), Frequently (4), Sometimes (3), Rarely (2), Absolutely none (1)	.70
Frequency of relationship with relatives	3,546	3.23	.89	Id.	.58
Affiliation					
Residents' association activities	3,532	1.97	1.30	4 or more days per week (7), 2–3 days per week (6), 1 day per week (5), 2–3 days per month (4), 1 day per month (3), a few days per year (2), not participating (1)	.60
Sports, hobbies, and recreation activities	3,534	2.84	2.03		.35
Volunteer or NPO activities	3,528	1.62	1.23		.65
Others	3,511	1.41	1.06		.38
Specialized Reciprocal Norms					
Do you think that if you have helped a person, you would be helped from that person later?	3,544	.27	.44	Agree (1) Neither agree nor disagree (0) Disagree (0)	–
Generalized Reciprocal Norms					
Do you think that if you have helped people, you would be helped by someone in a troubled situations someday?	3,541	.18	.38	Agree (1) Neither agree nor disagree (0) Disagree (0)	–
Generalized Trust					
Do you think that you can trust people generally?	3,446	4.94	2.26	It is possible to trust most of the people (9) ~ It should be with caution (1)	–
Trustworthiness in Public					
City/Town Office	3,427	2.94	.98	Able to count on (5)~	.80
School/Hospital	3,426	3.23	.93	Not able to count on (1)	.78
Police office	3,422	3.10	.93		.77
Residents' association	3,385	2.76	.90		.82
NPO/Civic group	3,345	2.69	.86		.79
Trustworthiness in Private					
Neighborhood Residents	3,442	2.97	1.02	Able to count on (5)~	.67
Family	3,434	4.26	.83	Not able to count on (1)	.73
Relatives	3,452	3.55	1.07		.81
Friends	3,455	3.62	.96		.76
Sense of Lifelong Learning					
People becoming citizens may continue leaning throughout life	3,468	3.00	.92	I think so (5) ~ Do not think so (1)	–
Key Competency					
I have the ability to use language, symbols, and text interactively	3,496	3.32	1.01	Strongly Agree (5) ~ Strongly Disagree (1)	.75
I have the ability to use knowledge and information interactively	3,495	3.38	.99		.72
I have the ability to use technology interactively	3,477	3.23	.99		.67
I have the ability to relate well to others.	3,490	3.26	1.07		.69
I have the ability to cooperate	3,494	3.46	.91		.65
I have the ability to manage and resolve conflicts	3,490	3.14	.89		.77
I have the ability to act within the big picture	3,490	3.57	.88		.74
I have the ability to form and conduct life plans and personal projects	3,493	3.04	.97		.71
I have the ability to assert rights, interests, limits, and needs	3,488	3.28	.95		.77

5.2 Dependent Variable

The Social Capital Integration Index (SCII) was created as a dependent variable. It was based on Putnam's (2001) Network, Reciprocal Norm, and Trust Index. The procedure for calculating the SCII score is as follows.

First, measurement items were set from the perspectives of network (dialogue and interaction, three items; affiliation, four items), reciprocity norms (specialized reciprocal norm, one item; generalized reciprocal norms, one item), trust (generalized trust, one item; trustworthiness in public, five items; trustworthiness in private, four items), based on knowledge of previous studies such as Putnam (2001). Measurement items and measures of subordinate variables are shown in **Table 2**.

Next, principal component analysis (promax rotation) was extracted for each of the four subordinate variables that were constructed from multi variables. One factor was extracted for each variable. The ranges of the factor scores are as follows: dialogue and interaction (three items, .58–.82), affiliation (four items, .35–.60), trustworthiness in public (five items, .77–.82), trustworthiness in private (four items, .67–.81). In addition, the sum of squared factor loads, which is an indicator of validity, and the α coefficient, which is an index of reliability, are as follows: dialogue and interaction (66.2%; .74), affiliation (48.9%; .60), trustworthiness in public (74.2%; .91), trustworthiness in private (73.6%; .88).

Finally, using the variable scores obtained by the procedure above, principal component analysis targeting seven subordinate variables was carried out. As a result of the analysis, one principal component was obtained. Component scores include dialogue exchanges (.71), affiliation (.58), specialized reciprocity norms (.42), generalized reciprocity norms (.40), generalized trust (.51), specialized trust in public (.62), specialized trust in private (.68), and generalization confidence. The seven items explained 32.4% of the variance, and the reliability score was .56 (α coefficient).

5.3 Individual-Level Explanatory Variables

Three variables related to learning (i.e., educational qualification, sense of lifelong learning, key competency) and 12 control variables related to respondents' demographics were set as individual-level explanatory variables. A summary of these variables follows.

Educational qualification. This variable refers to one's years of formal schooling. The questionnaire included an item regarding educational experience, wherein points were allotted as follows: junior high or less (9), high school (12), advanced vocational school (14), junior college (14), university (16), graduate school (18).

Sense of Lifelong Learning. To measure this variable, participants were asked to indicate (on a five-point scale) to what extent they agreed with the statement "People become good citizens through lifelong learning."

Key Competency. This refers to the various capabilities that one acquires through learning activities. Nine items were used to measure *self-assessment* of key competency, which were based on the three categories specified by Rychen and Salganik (2003): using tools

interactively, interacting in heterogeneous groups, and acting autonomously (see **Table 2**). Principal component analysis for the nine items resulted in the extraction of one main component. The nine items explained 70.6% of the variance, and the reliability score was .95 (α coefficient).

Control Variables. In addition to the aforementioned variables, 12 control variables were set. These included sex, age, years of residence, employment (e.g., self-employed, regular employee, temporary staff, public official, full-time housewife/husband), marital status, living arrangement (i.e., alone or with housemates), income bracket (top or bottom 10%), and home ownership.

5.4 Community-Level Explanatory Variables

Five community-level explanatory variables were set (i.e., educational qualification, sense of lifelong learning, key competency, population size, welfare recipient rate). The first three variables were aggregated from municipal data. The population size of each municipality was calculated according to the Japanese government's 2013 Resident Population Demographics and Households Database. Likewise, each community's welfare recipient rate was calculated according to the government's 2011 Welfare Recipient Numbers Database.

6 Analysis and Results

6.1 Descriptive Statistics

Fifteen individual-level variables and five community-level variables were set as explanatory variables; social capital was set as a dependent variable. Descriptive statistics for each variable are provided in **Table 3**. The correlation matrices for the individual and community-level variables are shown in **Tables 4 and 5**, respectively.

6.2 Multi-level Modeling

Multi-level modeling was employed to investigate the three research questions (see **Table 6**). The null model (Model 0) excluded explanatory variables and was used to compare variances between other models. Model 1 included individual-level variables as control variables, whereas Model 2 included three individual-level variables as learning variables. Model 3 included Model 2 in addition to interaction terms for household income and learning variables; this was to examine the adjustment effect of learning factors on the relationship between household income and social capital. Models 4, 5, and 6 added community-level variables sequentially to Model 2. Model 7 added all community-level variables to Model 2. Model 8 included Model 7 in addition to interaction terms for the poverty and learning variables; this was to examine the adjustment effect of learning factors on the relationship between poverty and social capital. The Akaike information criterion fitness index indicated that Model 6 possessed the lowest value, and was therefore the optimal model. Analysis of the multi-level modeling was conducted using IBM SPSS 19.0.

6.3 Direct Effects of Learning Factors on the Social Capital [RQ1]

In interpreting the results, focus was placed on Model 6 as the optimal model. As explanatory variables at the individual-level, sense of lifelong learning ($\beta = .118, p < .01$) and key competencies ($\beta = .321, p < .01$) had a positive effect on social capital. As explanatory variables at the community-level, educational qualification ($\beta = -.134, p < .01$) had a negative effect on social capital and key competencies ($\beta = .321, p < .01$) a positive effect. These results indicate that only key competencies had an effect on fostering social capital at both the community and individual levels. Hence, in assuming that social capital is a social outcome of learning, qualitative characteristics are more important than their quantitative counterparts.

Table 3. Descriptive Statistics

Variables	Mean	SD	SE	Min	Max
Dependent Variable					
Social Capital Integration Index	.00	1.00	.02	-3.33	3.55
Explanation Variable: Individual-level					
Sex (male=1, female=0; Dummy)	.46	.50	.01	.00	1.00
Age (Z score)	.00	1.00	.02	-2.12	1.68
Self-employed (yes=1, no=0; Dummy)	.10	.30	.01	.00	1.00
Regular employees (yes=1, no=0; Dummy)	.24	.42	.01	.00	1.00
Temporary staff (yes=1, no=0; Dummy)	.06	.23	.00	.00	1.00
Public officials (yes=1, no=0; Dummy)	.05	.21	.00	.00	1.00
Full-time house-wife/husband (yes=1, no=0; Dummy)	.17	.38	.01	.00	1.00
Live with some housemate (yes=1, no=0; Dummy)	.74	.44	.01	.00	1.00
Household income segments: Low group (Lowest 10%)	.10	.30	.01	.00	1.00
Household income segments: High group (Highest 10%)	.08	.28	.00	.00	1.00
Own house (yes=1, no=0; Dummy)	.65	.48	.01	.00	1.00
Residence years (Z score)	.00	1.00	.02	-.32	6.11
Educational qualification	13.22	2.24	.04	9.00	18.00
Sense of lifelong learning	4.00	.92	.02	1.00	5.00
Key competencies	.00	1.00	.02	-3.33	2.47
Experimental Variables: Community-level					
Population size	.03	1.02	.10	-1.10	3.51
Welfare recipient rate	1.32	1.26	.13	.00	5.41
Educational qualification at the community level	13.20	.83	.08	10.78	14.94
A sense of lifelong learning at the community level	4.00	.21	.02	3.48	4.52
Key competencies at the community level	.00	.23	.02	-.66	.58

Table 4. Correlation Matrix of Individual-Level Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Social Capital Integration Index															
2. Sex	-.041*														
3. Age	.223**	.087**													
4. Self-employed	.079**	.098**	.116**												
5. Regular employees	-.125**	.222**	-.358**	-.183**											
6. Temporary staff	-.085**	.032**	-.058**	-.080**	-.135**										
7. Public officials	.006**	.064**	-.075**	-.074**	-.125**	-.055**									
8. Full-time house-wife/husband	.091**	-.407**	.123**	-.149**	-.252**	-.110**	-.102**								
9. Live with some housemate	.154**	.051**	.240**	.064**	-.082**	-.067**	.037**	.171**							
10. Household income segments: Low group	-.048**	-.021**	.154**	.012**	-.141**	-.009**	-.065**	-.066**	-.245**						
11. Household income segments: High group	.057**	-.018**	-.058**	-.015**	.074**	-.010**	.055**	-.040**	.061**	-.100**					
12. Own house	.199**	.041**	.269**	.126**	-.092**	-.049**	.023**	.015**	.111**	-.061**	.014**				
13. Residence years	.057**	.026**	.138**	.088**	-.093**	-.010**	-.005**	.010**	.021**	.038**	-.016**	.098**			
14. Educational qualification	-.024**	.095**	-.343**	-.068**	.194**	.041**	.153**	-.129**	-.006**	-.201**	.146**	-.040**	-.109**		
15. Sense of lifelong learning	.218**	-.017**	.044**	.031**	-.009**	-.006**	.043**	.015**	.071**	-.073**	.059**	.038**	-.040**	.135**	
16. Key competencies	.363**	.044**	.101**	.083**	-.001**	.006**	.070**	-.051**	.078**	-.068**	.108**	.053**	.003**	.133**	.294**

Note. $N = 3,575$. ** $p < .01$, * $p < .05$.

Table 5. Correlation Matrix of Community-Level Variables

Variables	1	2	3	4
1. Population size				
2. Welfare recipient rate	.250*			
3. Educational qualification at the community level	.477**	.076**		
4. Sense of lifelong learning at the community level	.132**	.002**	.369**	
5. Key competencies at the community level	.109**	.009**	.346**	.440**

Note. $N = 100$. ** $p < .01$, * $p < .05$.

Table 6. Multi-Level Modeling for Social Capital Integration Index as a Dependent Variable

	<i>Model 0</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>
Fixed Effect									
Intercept	-.002	-.181**	-.153**	-.509**	-.139**	-.097	1.176	.745	.588
Individual-level									
Sex		-.105**	-.088**	-.082**	-.085*	-.088**	-.086**	-.084**	-.086**
Age		.135**	.088**	.083**	.089**	.088**	.087**	.089**	.089**
Self-employed		.105**	.015**	.011**	.014	.013**	.012**	.011**	.011**
Regular employees		-.108**	-.148**	-.152**	-.150**	-.149**	-.150**	-.151**	-.153**
Temporary staff		-.238**	-.279**	-.270**	-.281**	-.280**	-.280**	-.281**	-.283**
Public officials		.036**	-.073**	-.067**	-.077**	-.073**	-.076**	-.078**	-.073**
Full-time housewife/husband		.096**	.125**	.123**	.126**	.126**	.126**	.126**	.129**
Live with some housemate		.174**	.138**	.138**	.138**	.138**	.139**	.139**	.137**
Household income segments: Low group		-.177**	-.111**	.507**	-.133**	-.108**	-.124**	-.119**	-.118**
Household income segments: High group		.193**	.079**	.088**	.089**	.079**	.083**	.085**	.083**
Own house		.232**	.229**	.235**	.208**	.220**	.210**	.197**	.189**
Residence years		.157**	.128**	.127**	.127**	.125**	.129**	.128**	.126**
Educational qualification			-.006**	-.005**	-.007**	-.006**	-.007**	-.007**	-.008**
Sense of lifelong learning			.118**	.106**	.118**	.117**	.118**	.117**	.117**
Key competencies			.321**	.312**	.321**	.321**	.321**	.321**	.322**
Household income segments: Low group × Educational qualification					-.050**				
Household income segments: Low group × Sense of lifelong learning					.006**				
Household income segments: Low group × Key competencies					.142**				
Household income segments: High group × Educational qualification					-.035**				
Household income segments: High group × Sense of lifelong learning					.125**				
Household income segments: High group × Key competencies					-.068**				

(Continued)

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	<i>Model 0</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>
Community-level									
Population size					-.086**			-.055**	.311**
Welfare recipient rate						-.039**		-.026**	-.089**
Educational qualification at the community level							-.134**	-.097**	-.094**
Sense of lifelong learning at the community level							.116**	.104**	.136**
Key competencies at the community level							.412**	.390**	.023**
Population size × Educational qualification at the community level									.017**
Population size × Sense of lifelong learning at the community level									-.150**
Population size × Key competencies at the community level									.027**
Welfare recipient rate × Educational qualification at the community level									.010**
Welfare recipient rate × Sense of lifelong learning at the community level									-.012**
Welfare recipient rate × Key competencies at the community level									.225**
Random Effects									
Between-Community Variance	.058**	.040**	.045**	.043**	.039**	.044**	.036**	.033**	.031**
Educational qualification			.000**	.000**	.000**	.000**	.000**	.000**	.000**
Sense of lifelong learning			.000**	.004**	.000**	.000**	.000**	.000**	.000**
Key competencies			.009**	.007**	.009**	.009**	.009**	.009**	.009**
Within-Community Variance	.944**	.864**	.745**	.742**	.745**	.745**	.745**	.744**	.744**
ICC	.058**	.044**	.057**	.055**	.050**	.056**	.046**	.042**	.040**
AIC	8672**	7970**	7354**	7359**	7349**	7357**	7344**	7349**	7359**

Note. Individual-level: $N = 3,575$. Community-level: $N = 100$. ** $p < .01$, * $p < .05$.

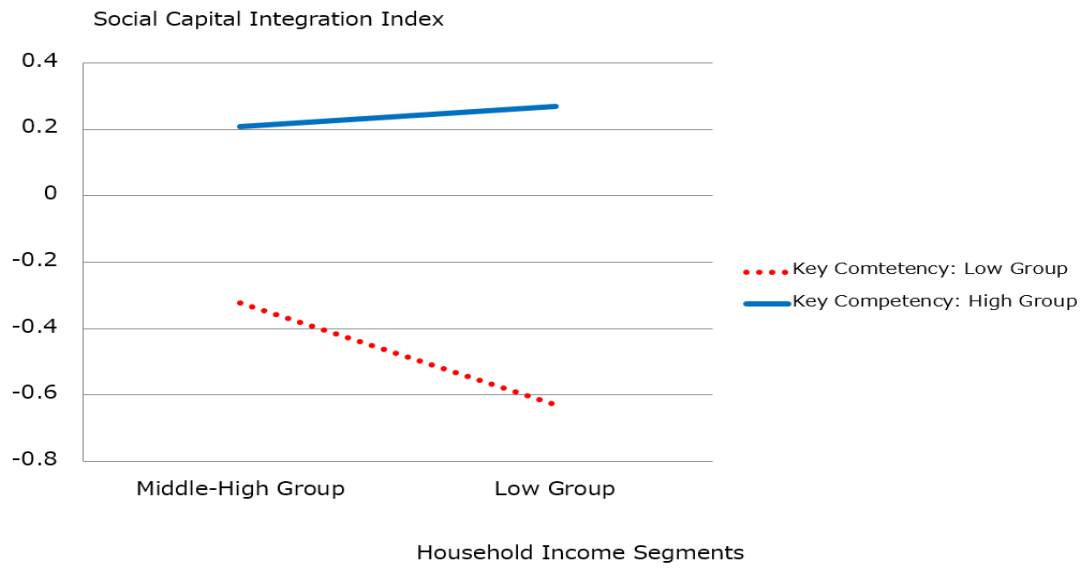


Fig. 1. Interaction Plot of Household Income Segments and Key Competencies

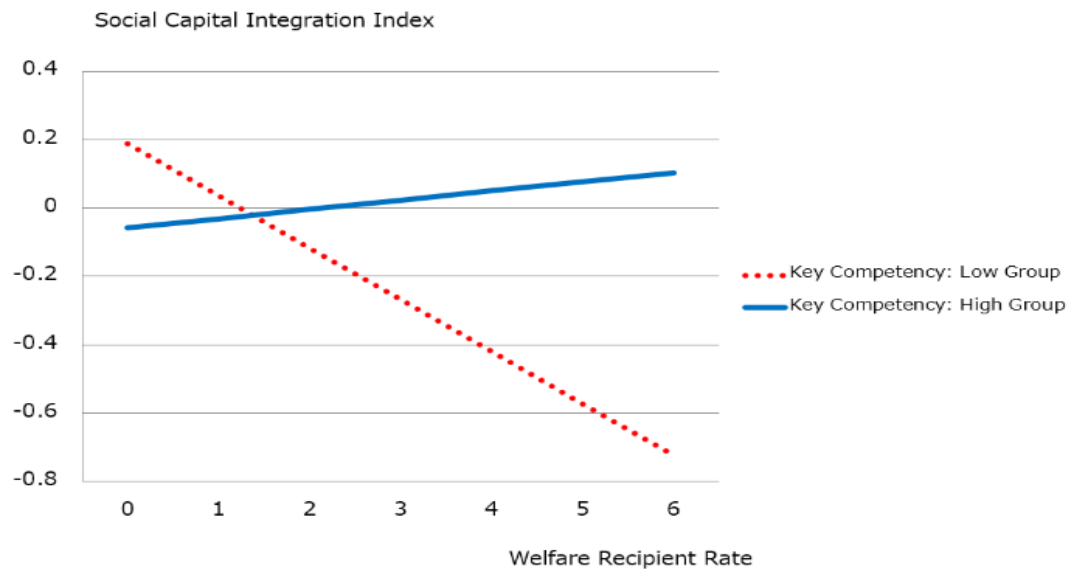


Fig. 2. Interaction Plot of Welfare Recipient Rate and Key Competencies

6.4 Adjustment Effect of Learning Factors in the Relationship between Economic Situation and Social Capital [RQ2]

In interpreting the results, focus was placed on Models 3 and 8, which included interaction terms for the learning factors and economic condition variables. In Model 3, there was a statistically significant adjustment effect for the interaction term of the low income group and key competencies ($\beta = .142, p < .05$). In Model 8, there was a statistically significant adjustment effect

for the interaction term of welfare recipient rate and key competencies ($\beta = .225, p < .01$). Interaction plots are provided in **Figures 1** and **2**. These results suggest that key competencies had an adjustment-effect relationship with economic conditions and social capital at both the individual and community levels.

6.5 Community-Level Differences in the Effect of Learning Factors on Social Capital [RQ3]

If the effect of learning factors on social capital differed between communities, the variance of the slope presented in the random effect column (see **Table 6**) should be significant. However, the variance of slope relationship between the three learning factors and social capital was not significant between communities. Hence, the learning factors' effect on social capital was constant between communities.

7 Discussion

The purpose of the present study was to reveal the social outcomes of learning by clarifying the relationship between key competencies and social capital. The analysis demonstrates that key competencies (at both individual and community levels) have direct effects on building social capital, even controlling for a variety of variables. The components of key competencies, such as using tools interactively, interacting in heterogeneous groups, and acting autonomously (Rychen & Salganik 2003), contribute to building ties with family, neighborhood, and members of the local community. The present study reveals that the building of social capital is determined by the substantial ability of individuals formed by learning activities rather than educational qualification levels. Moreover, community-level key competencies also have effects on the building of social capital. In a community with many people who have high-level key competencies, residents have the benefit of lowered risk of social isolation. We can interpret this as meaning that people who have high-level key competencies make rich social ties with their surroundings.

As mentioned previously, social capital contributes to children's development and growth (e.g. Coleman 1988; Putnam 2001). On the other hand, as is well known, when many adults in a community experience social isolation, this has a negative impact on children's development and growth. It is very interesting that the major factor for building social capital is the key competencies of adults. Based on the present study's results, we might insist that children's abilities would be increased by building social capital through adults' abilities acquired through learning activities. It should be noted here that the building of social capital is hardly affected by educational qualifications acquired through the formal education system but rather by adults' abilities (such as key competencies) acquired in the process of gaining educational qualifications and lifelong learning rather than the educational qualifications themselves.

Key competencies have an adjustment effect on the relationship between economic hierarchy and social capital in addition to a direct effect on social capital. As mentioned previously, the key competency level of an individual has the effect of maintaining ties with the surrounding

residents without falling into social isolation, even if they face economically difficult circumstances. Such effects have been confirmed also for key competencies at the community level. The improving effects of adult key competencies at the individual and community levels have the power to counteract tendencies to social isolation due to bad economic conditions. The above results suggest that to counteract social isolation and increase social ties, we should carry out social investment in learning opportunities to foster key competencies.

However, we should further investigate whether the key competency level has similar effects on building social capital in all communities within a nation. If there are variances in the effect between communities, social investment effects would be similarly diverse nationwide. On the other hand, in the absence of such variance social investment effects would be uniform nationwide. Random effect analysis shows the effect of key competencies on social capital is common to all communities. Therefore, we insist that the implementation of development policy of adult key competencies is possible on the national level.

8 Conclusion

Based on the analysis and discussion above, let us summarize the features of the social outcomes of learning in Japan. The present study measured “learning experiences” in focusing on the sense of lifelong learning and key competencies as qualitative aspects of the learning experience, in addition to educational qualifications as a quantitative aspect of the learning experience. In addition, the present study measured “social outcomes” in focusing on social capital. Based on these results, we confirmed the following three features.

First, the building of social capital is affected by the qualitative aspects of learning experience. Promoting the understanding of the significance of lifelong learning and acquiring key competencies through learning experience are effective in building rich ties among people. Moreover, we found that in communities whose key competencies are high on average, people who live there have the possibility of cultivating rich ties among people. On the other hand, people who live in communities with high educational qualifications on average are vulnerable in regard to the cultivation of rich ties among people. This confirms the claims of Inaba (2007) and Ishida (2015). If you aim at achieving economic growth, investment in educational qualifications is effective. However, if you aimed at building social capital, investment in educational qualification would not have a direct effect. In order to foster ties among people in the community, including family, relatives, and the neighborhood, it is effective to invest in the qualitative aspects of learning experience, such as a sense of lifelong learning and key competencies, rather than investing in the quantitative aspects of learning like educational qualifications.

Second, key competencies as a qualitative aspect of learning have an adjustment effect on the relationship between economic hierarchy and social capital. As the analysis suggests, learning has the effect of suppressing the erosion of social capital that occurs in economic difficulties in addition to increasing social capital otherwise. If you do nothing to cope, economic difficulties

erode social ties and promote social isolation. Certainly, it is not socially desirable that a difficult economic situation lead to social isolation. However, by increasing the key competency level, it is possible to avoid such negative effects. We think that these findings reveal a new aspect of social outcomes of learning that has not pointed out before.

Finally, the qualitative aspects of learning (the sense of lifelong learning and key competencies) have direct effects on building social capital in communities anywhere. The phenomenon of “building ties through learning” would appear in any community in any country regardless of community factors. Moreover, it was confirmed that if building social capital is a policy goal, the development of the sense of lifelong learning and key competencies are valid as educational policy or social investment at the national level.

9 Limitations and Prospects for Future Research

Finally, we briefly discuss the limitations of this study and prospects for future research.

First, the present study has methodological limitations in measuring key competencies as the most important variable in learning factors. In the present study, key competencies were measured with a questionnaire rather than a test like PIAAC. Measurement by test is expensive. As the present study set out to measure 10,000 people on a limited budget, measurement by test would have been very difficult. Issues of the validity and reliability of measurement by questionnaire of key competencies (substantially a self-assessment of key competencies) have been cleared. However, further efforts to improve the measurement will be necessary in the future.

Second, the present study uses the integration index as an index of social capital. This does not allow verification of the impact of explanatory variables on each component of social capital, such as network, reciprocal norms, and trust. Analyzing each component element leads to redundancy issues in the results. However, the confirmation of analysis results for each component is an important research work that we plan to carry out in the future.

Third, the present study is not sufficient to demonstrate the causality of the relation between key competencies and social capital. This study adopted a one-shot survey. Therefore, the results presented in this study are correlations rather than indications of causality. In the future, we will try to examine the causal relation between key competencies and social capital by collecting longitudinal data.

Fourth, the present study has the problem that the community-level data are not necessarily representative. The characteristics of a municipality are summarized by samples of no more than 100 people. In addition, the characteristics of subordinate communities were ignored by choosing the municipality as the community unit, which is also not necessarily representative. We should interpret the analysis results in light of these limitations.

Finally, the present study insufficiently describes how the development of key competencies contributes to building social capital. The present study was able to examine the effects of key competencies on social capital. However, quantitative research cannot reveal how the relationship between key competency and social capital is configured in the real world. In the

future, it will be necessary to carry out qualitative research on this issue.

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