

# Relationship between Family Social Capital and Academic Performance: Examining School Organizational Activities as a Mediator Variable

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## Introduction

The purpose of this study is to identify factors that mediate the relationship between family social capital and academic performance by analyzing school-level data. The need to clarify the effects of family social capital is a core issue in social capital research, and following Coleman (1988, 1990), many studies have investigated the topic.

Since its appearance in Coleman's (1988) benchmark article, the concept of "social capital" has received increasing attention among educational researchers. Coleman pointed out that previous research has emphasized the importance of financial resources (typically measured by wealth and family income) and human resources (typically measured by parental educational attainment) in promoting students' educational outcomes, while ignoring the impact of social resources. Following his work, many studies have focused on the relationship between amount of family social capital and children's academic performance. For example, regarding family social capital, variables such as "parent expectation and support" and "parent-child interaction" have been found to positively influence the academic

performance of children (Carbonaro, 1998; Croll, 2004; Ho Sui-Chu & Willms, 1996; Ream & Palardy, 2008; Simizu, 2010; Sun, 1999). In contrast, structural variables such as "sibship size" and "nontraditional family structure" have been found to negatively influence children's academic performance (Bassani, 2008; Dunifon & Kwaleski-Jones, 2002; Han, Waldfogel, & Brooks-Gunn, 2001; Sun, 1999).

Although previous research has demonstrated that family social capital is associated with academic performance, several implications of the social capital model remain to be thoroughly tested. In particular, relatively few works have examined the mediate effects of school organizational activities on the relationship between family social capital and academic performance. In nations with high compulsory education enrollment rates, such as a Japan (substantial enrollment rates: elementary school = 99.7%, junior high school = 97.3%<sup>1</sup>), we can not ignore the impact of school organizational activities on children's academic performance. Therefore, in this study, we formulate an analysis model to investigate the influence of family social capital on academic performance by focusing on school organizational activities as a mediator variable.

## THEORIES AND CONCEPTUAL FRAMEWORK

### Social Capital and Educational Performance

This study builds on past research that has examined the link between social capital and educational performance. In discussing the ways in which family social capital influences educational performance, Coleman (1988) focused on three indicators.

First, he focused on parent-child interaction, pointing out that more and higher quality communication and interaction between a mother and her children enhances the children's academic achievement. In subsequent studies, Croll (2004) and Ho Sui-Chu and Willms (1996) demonstrated that the frequency of a mother's interaction with her children has a positive effect on academic performance. Further, parents' knowledge of their children's activities outside the home is a good indicator of both the quality and quantity of parent-child dialogue, which also has a positive effect on educational performance (Parcel & Dufur, 2001). "Limiting the amount of time for watching TV" and "limiting the amount of time for going out with friends" are also important indicators of the reality of dialogue in a home (Ho Sui-Chu & Willms, 1996).

Second, Coleman focused on mothers' expectations and support for their children. He pointed out that a mother's expectations about the eventual educational attainment of her children reflects her interest, concern, and personal investment in their life. Therefore, mothers' educational expectations facilitate their support of children's daily homework. Carbonaro (1998) demonstrated that parents' high expectations for their children to obtain a bachelor's degree has a positive effect on the children's academic performance. Ream and Palardy (2008) reported that parental support in course selection or

registration procedures also affects children's academic performance. In addition, regular homework checks by parents have a positive impact on children's educational performance (Croll, 2004; Ho Sui-Chu & Willms, 1996).

Finally, Coleman(1988) focused on family structure, arguing that two parents have more time and energy for their child or children than one parent. He viewed the number of siblings in a family primarily as a form of resource dilution. For example, the more siblings in a family, the smaller the proportion of total family resources available to each. Coleman(1988) argued that mothers' working outside the home adversely affects the mother-child relationship. Moreover, subsequent studies have consistently found the physical presence of both biological parents in the household and small sibship size to be positively related to academic performance (Bassani, 2008; Downey, 1995; Dunifon & Kowaleski-Jones, 2002; Han *et al.*, 2001; Pong, 1998; Ream & Palardy, 2008; Smith, Beaulieu & Seraphine, 1995; Sun, 1998).

Family social capital has previously been measured by the indicators described above. However, in this study, we considered that family structure is not a configuration factor, but rather a determinant factor, of family social capital. Social capital is a concept that explains interpersonal relationships, including trust, norms, and network (Coleman, 1988; Putnam, 2000). Although family structure is a determinant factor in interpersonal relationships within the home, it is not an interpersonal relationship itself (Ravanera & Rajulton, 2010; Turney & Kao, 2009).

### School Organizational Activities as a Mediator Variable

Some studies have focused on the relationship between social capital and academic performance; however, the influence of school organization has been treated as a black box. In Japan, in order to

buffer the gap in educational function among families, schools employ specific projects aimed at improving academic performance. In many schools, such academic performance improvement projects have been promoted by collaborative activities at the school organizational level, under the principal's educational vision. The strategies of school organizational activities in academic performance improvement projects consist of the following three main objectives

The first objective is to facilitate the learning motivation and learning habits of children by improving lessons (King & Newman, 2001; Louis & Marks, 1998; Vogt & Rogalla, 2010). High-quality lessons can stimulate children's interest in learning, improve their attitude toward learning, and help them develop good learning habits. We assumed that a greater commitment to learning resulting from an improvement in the quality of lessons has a significant impact on students' academic performance.

The second objective is to improve school norms such as school discipline (Gottfredson & DiPietro, 2011; Payne, Gottfredson & Gottfredson, 2003). Formation of school-level norms has a suppression effect on personal victimization among children (Gottfredson & DiPietro, 2011). Gottfredson and DiPietro (2011) suggested that school norms create a safe, secure environment that enables children to concentrate on learning and teachers, on teaching. Thus, we assumed that the improvement of school norms has some influence on children's academic performance.

The third objective is to foster a positive attitude for building interpersonal relationships. Previous studies have demonstrated that children who have mastered a positive attitude for building interpersonal relationships have higher academic performance (Anderson, 2008; Huang, 2009; Morgan & Sorensen, 1999; Pribesh & Downey, 1999; Shimizu, Nakamura, & Chinen 2012). Further, they are considerate of

friends and enjoy engaging in learning activities with others. Many schools in Japan emphasize the development of children's attitudes such that they willingly build interpersonal relationships. This is achieved through classroom activities in the main subjects (Japanese, mathematics, science, social studies, and so on), moral education, and extracurricular activities. These curricula in school organization facilitate children's motivation to build interpersonal relationships. When many children in the classroom are motivated in this way, the class becomes a high-quality group, which leads to high learning motivation and strong academic performance.

These three factors—learning motivation, school norms, and interpersonal relationships—are affected by family social capital. Moreover, the extent to which children study hard, follow school rules, and are actively involved with friends is not independent of family social capital. When the level of family social capital is low, these three factors are expected to be low as well. On the other hand, if the level of family social capital is high, these factors are higher, too.

### **Unit of Analysis**

In empirical studies that have focused on relationships between family social capital and academic performance, the academic performance of individual children has been set as the general performance indicator. Indeed, there is practical and scientific value in clarifying the determinant factors of individual children's academic performance. However, such findings do not provide many practical implications for school management, because children's various activities at school were excluded from the studies. Children's family social capital has a major impact on their school learning activities, which, in turn, strongly affects their academic performance. Many studies on family social capital

have focused on analytical models aimed at demonstrating the direct effect of family social capital on either academic performance or dropout rates.

Setting the unit of analysis (e.g., person, classroom, school, district, municipality, state, or nation) is an important issue for social capital research because findings will differ depending on it (Hanibuchi, Ichida, Hirai, & Kondou, 2008). Social capital takes different forms, has multiple dimensions, and can be measured for various units of analysis. For many proponents (e.g., Bourdieu, 1985; Lin, 2001), social capital is an attribute of individuals. For others, such as Coleman (1988), it is also an attribute of families and communities. Putnam's (2000) concept of social capital, and that of others, applies to larger groups such as regions or nations. In this study, we focus on the school level to analyze the relationship among family social capital, school organizational activities, and academic performance by setting the school organization as the unit of analysis. Many studies that have attempted to clarify the relationship of these factors used individuals as the unit of analysis. Fewer works have set the school as the unit of analysis (Goddard, Salloum, & Berebitsky, 2009). Therefore, it remains unknown whether a school-level analysis will produce the same results as an individual-level analysis. We hypothesize that high family social capital schools improve school organizational learning activities and academic performance at the organizational level.

## METHOD

### Data Sources

The study sample is drawn from the 2009 Student Survey of the School Board of Ehime Prefecture, conducted by the Project Team of Academic Development (PTAD) established by the School Board. For this survey, PTAD employed a

stratified random sampling design (by geographic area and population size) to select a sample of 111 elementary schools from a population of 335 elementary schools in the Ehime Public School system. In this survey, 3,582 fifth grade students responded to a variety of questions and took the achievement test of Japanese Language and Mathematics.

Surveys were conducted over two periods. In Phase I (July 2009), the achievement test was administered to the fifth grade students of 111 elementary schools. In Phase II (December 2009), the achievement test and questionnaire targeted the same cohort. PTAD conducted the surveys in collaboration with the principal of each participating school.

### Scale Items

Below, we describe how we measured the following variables: math test score, family social capital, commitment to learning, commitment to school norms, commitment to interpersonal relations, school size, and regional economic conditions.

*Math test score (July & Dec. 2009)*. The math test score served as an academic performance indicator. A school's score is the mean across student test scores.

*Family social capital*. To measure family social capital, we created six new questionnaire items that asked about students' daily habits and home learning. The items were rated on a 4-point scale from 1 (*never do*) to 4 (*always do*). The six items were as follows: "I eat breakfast at home," "I talk with family about what happens at school," "I help with housework," "I do my homework," "I study based on a plan created at home," and "I prepare to go to school the day before." A school's score is the mean across student response scores. The school-level alpha was .73. Confirmatory factor analysis (CFA)<sup>2</sup> revealed that the scale consisted of one factor. Factor scores were

distributed in the range of .30 to .74.

*Commitment to learning.* To measure students' commitment to learning, we created four new questionnaire items that asked about motivation and attitude toward math lessons. The items were rated on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The four items were as follows: "I like to study math, " "I think learning math is very important, " "I understand the contents of math lessons, " and "When I solve math problems, I explore how to solve them more easily." A school's score is the mean across student response scores. The school-level alpha was .87. CFA revealed that the scale consisted of one factor. Factor scores were distributed in the range of .67 to .85.

*Commitment to interpersonal relations.* To measure students' commitment to interpersonal relations, we created four new questionnaire items from the perspective of understanding others and willingness to help others. The items were rated on a 4-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*). The four items are as follows: "I want to be a good person who can help others, " "I want to be a good person who can understand the feelings of others, " "I am given the opportunity to present my ideas in daily lessons, " and "I am given the opportunity to have discussions with friends in daily lessons." A school's score is the mean across student response scores. The school-level alpha was .84. CFA revealed that the scale consisted of one factor. Factor scores were distributed in the range of .69 to .87.

*Commitment to school norms.* To measure students' commitment to school norms, we created four new questionnaire items from the perspective of compliance attitude toward school and classroom rules. The items were rated on a 4-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*). The four items were as follows: "I comply with school rules, " "I think bullying is an unforgivable action, " "I keep promises I make to my friends, " and "I have

carefully written notes on daily lessons." A school's score is the mean across student response score. The school-level alpha is .75. CFA revealed that the scale consisted of one factor. Factor scores were distributed in the range of .62 to .70.

*School size.* The number of fifth grade respondents was configured as a proxy indicator of school size.

*Regional economic conditions.* The annual income per resident in the community where the schools were located was configured as a proxy indicator of regional economic conditions.

## Analytic Strategies

We have adopted the following strategies for data analysis.

*Analytic procedure.* To examine the mediator effects of school organizational activities on the relationship between family social capital and academic performance, we created the following two analytic models. The first is the direct effects model, the purpose of which is to confirm whether family social capital directly affects academic performance. Previous academic performance, school size, and regional economic conditions are control variables in this model. The second model is the indirect effects model, which focuses on the mediate impact of school organizational activities. The purpose of the indirect effects model is to identify school organizational factors linking the relationship between family social capital and academic performance. This model uses the same control variable as the direct effects model. By comparing the two models, we distinguish characteristics of the effects of school organizational activities on the relationship between family social capital and academic performance.

*Analytic method.* In general, path analysis or structural equation modeling is used to analyze indirect effects among variables. Because the analytic

model of this research consists of observed variables only, path analysis was selected as the method. The software used was *AMOS ver. 18 (Japanese version)*.

*Data for analysis.* Putnam's (2000) study, which focused on the performance of the state government, analyzed state-level aggregate data. On the other hand, this study, which focused on the effects of school organization, analyzed school-level aggregate data. The survey sample consisted of 111 elementary schools. However, the data used in the analysis were drawn from the 96 schools that met two requirements: (1) More than four students per school participated in the study and (2) the students completed both achievement tests. To facilitate interpretation of the results, all variables used in the analysis were standardized ( $M=0$ ,  $SD=1$ ).

## RESULTS

### Descriptive Analysis

Table 1 shows the means, standard deviations, and range of all the variables. Table 2 shows correlations among the variables. The reliability and validity of each variable have already been mentioned.

### Direct Effects Model

First, we created a path model to demonstrate the

direct effects of family social capital (Figure 1). In this model, the effects of family social capital on test scores can be verified by controlling the effects of the test scores from approximately the previous six months, school size, and regional economic conditions. The path model was found to fit the data ( $\chi^2 = .330$ ,  $DF=2$ ,  $\chi^2/DF=.165$ ,  $p=.848$ ,  $GFI=.999$ ,  $AGFI = .990$ ,  $RMR=.017$ ) and accounted for 58% of the variance in math test scores for December 2009. As shown in Figure 1, family social capital did not have a direct effect on math test score ( $\beta=.06$ ,  $p=n. s.$ ).

### Indirect Effects Model

As mentioned, we believe the relationship between family social capital and academic performance is mediated by school factors. Therefore, we assumed a path model in which three variables (commitment to learning, commitment to interpersonal relations, and commitment to school norms) as mediating factors connect family social capital and academic performance (see Figure 2). To construct the indirect effects path model, we referred to the results of correlation analysis (Table 2). The three variables are not set as parallel in the indirect model. Because commitment to learning is the only variable that has a significant correlation with academic performance ( $r=.30$ ,  $p<.01$ ), we posited a relationship in which both

**Table 1. Descriptive Statistics**

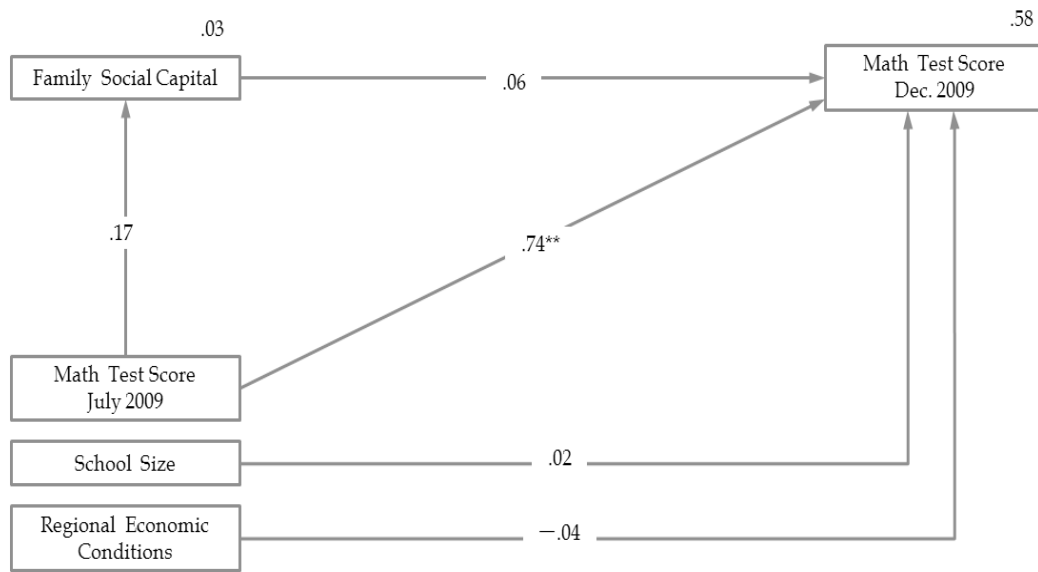
	<i>M</i>	<i>SD</i>	Range (after standardized)		
Math Test Score July 2009	64.94	6.97	46.40	—	85.00 (-2.75 — 2.96)
Math Test Score Dec. 2009	69.76	6.17	52.80	—	88.00 (-2.66 — 2.88)
Family Social Capital	3.51	.15	3.04	—	3.85 (-3.13 — 2.27)
Commitment to Learning	3.33	.23	2.31	—	3.88 (-4.38 — 2.33)
Commitment to Interpersonal Relations	3.51	.20	2.47	—	3.94 (-5.15 — 2.09)
Commitment to School Norms	3.50	.16	2.89	—	3.92 (-3.73 — 2.54)
School Size	38.28	30.97	4.00	—	126.00 (-1.11 — 2.83)
Regional Economic Conditions	2, 317.00	417.61	1, 845.00	—	2, 747.00 (-1.13 — 1.03)

*Note.*  $N = 96$  schools.

**Table 2. Correlations**

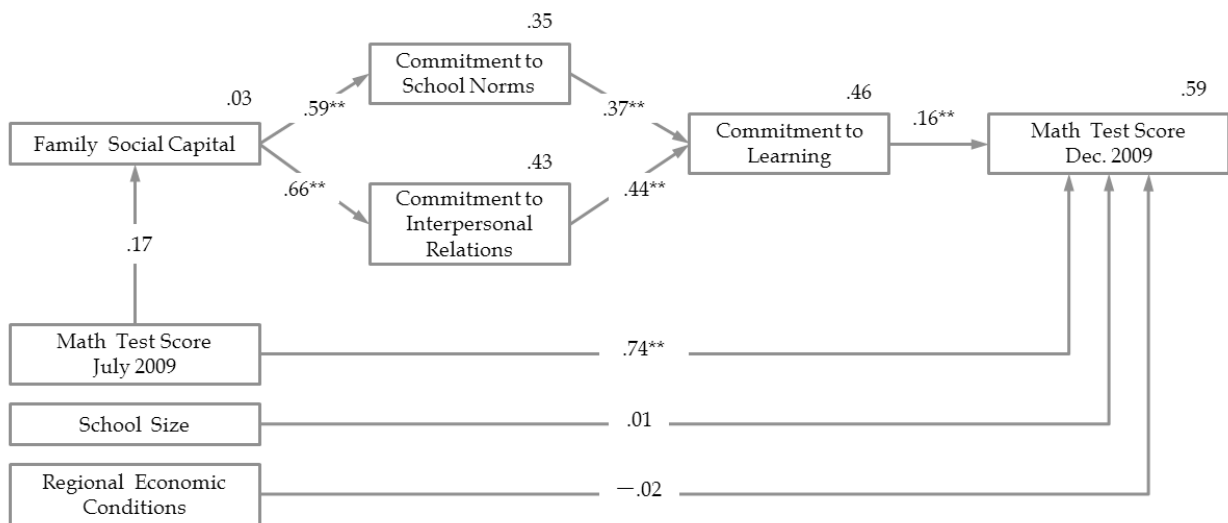
	1	2	3	4	5	6	7
1. Math Test Score July 2009							
2. Math Test Score Dec. 2009	.76**						
3. Family Social Capital	.17	.19					
4. Commitment to Learning	.17	.30**	.50**				
5. Commitment to Interpersonal Relations	.19	.19	.66**	.66**			
6. Commitment to School Norms	.10	.13	.59**	.64**	.68**		
7. School Size	-.03	-.01	.05	.05	-.09	.01	
8. Regional Economic Conditions	-.10	-.10	.02	-.07	.05	.01	.37**

Note. N = 96 schools. \*\* p < .01.



$\chi^2 = .330, DF = 2, \chi^2/DF = .165, p = .848, GFI = .999, AGFI = .990, RMR = .017$

**Figure 1. Direct Effects Model**



$\chi^2 = 38.42, DF = 16, \chi^2/DF = 2.40, p = .001, GFI = .916, AGFI = .811, RMR = .066$

**Figure 2. Indirect Effects Model**

commitment to interpersonal relations and commitment to school norms have an impact on commitment to learning, as shown in Figure 2. The path model was found to fit the data ( $\chi^2=38.42$ ,  $DF=16$ ,  $\chi^2/DF=2.40$ ,  $p=.001$ ,  $GFI=.916$ ,  $AGFI=.811$ ,  $RMR=.066$ ) and accounts for 59% of the variance in math test scores for December 2009. The fitness index has been reduced with the increasing complexity of the model. However, serious flaws have not been found regarding the fitness index.

According to Figure 2, the impact of family social capital on academic performance can be explained as follows. In high family social capital schools, students have a high motivation for building interpersonal relationships with classmates, and teachers provide plenty of opportunities for students to participate in interactive activities ( $R^2=.43$ ). Therefore, many students have high integrity and have formed a compliant attitude toward school rules ( $R^2=.35$ ). In addition, the students' learning motivation is improved by the level of interpersonal relations and school norms ( $R^2=.46$ ). Finally, students' learning motivation improves their academic performance ( $R^2=.59$ ).

## DISCUSSION

The purpose of this study was to identify factors that mediate the relationship between family social capital and academic performance by analyzing school-level data. The analysis of individual-level data revealed that family social capital has a statistically significant impact on academic performance (e.g., Carbonaro, 1998; Croll, 2004; Ho Sui-Chu & Willms, 1996; Parcel & Dufur, 2001; Ream & Palardy; Shimizu, 2010). However, the analysis of school organizational level data showed that family social capital has no direct impact on academic performance. Figure 3 is a scatter plot that shows the lack of correlation between family social capital and

academic performance ( $r=.19$ ,  $p=n. s.$ ). The influence of individual households has been offset in school organizational activities. Such activities can prevent direct linking of family situation and academic performance.

What then are the school organizational factors that mediate the relationship between family social capital and academic performance? This study proposes the following explanation, which connects both variables.

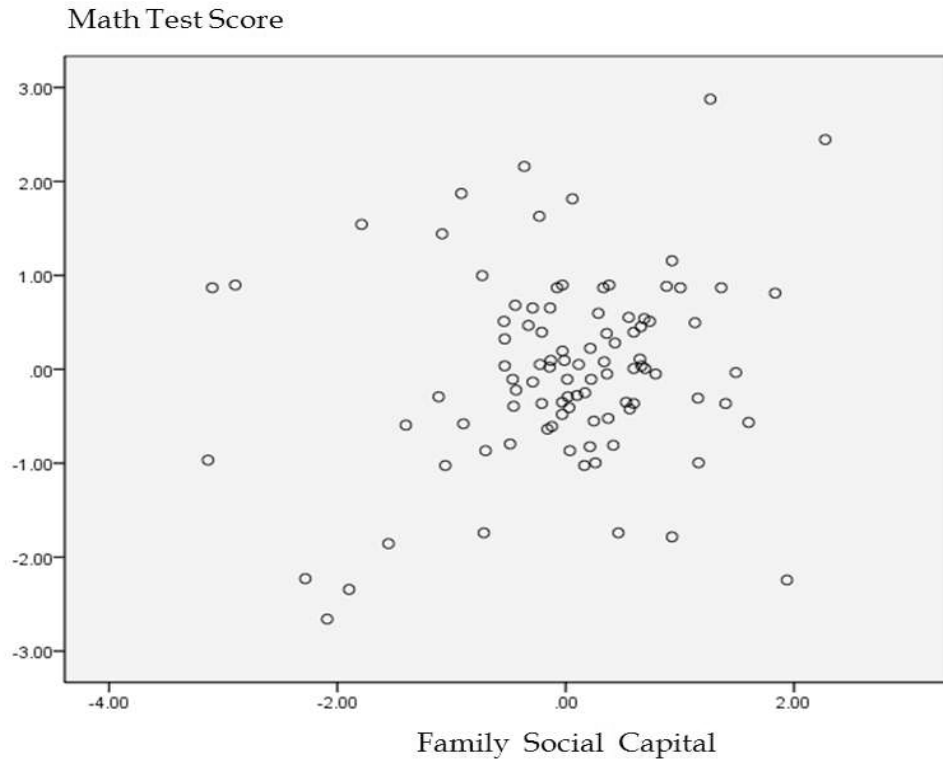
Family social capital positively influences students' attitude toward building good relationships with classmates. This finding can be interpreted as an indication that the mutual bonding between parents and children in family life leads to the children's willingness to build social ties with their classmates. Further, the results of the analysis suggested that building ties among students through school life and increasing the number of interactive learning activities with each student during class can improve motivation toward learning activities.

In addition, family social capital affects students' attitude toward following the school norms and maintaining discipline. We found that school norms that focused on school compliance were easily formed if there were many families with high-level family social capital in the community. As Gottfredson and Dipietro (2011) pointed out, in schools that have discipline-oriented norms, bullying and victimization are less likely to occur; therefore, students can learn without having to fear others.

Thus, the relationship between family social capital and academic performance can be explained by the above two descriptions. The results of this study suggested that improving interpersonal interactions and ties among students, including their bonds with teachers, is important in facilitating strong academic performance.

Finally, we would like to mention various limitations of this study. First, the research only addressed elementary school students in Ehime





**Figure 3. A scatter plot of family social capital and Math test score Dec. 2009:school-level data**

Prefecture and focused on math test scores. We have to extend the survey targets for generalization of knowledge, when we would carry out the further research. Second, this research has excluded the individual-level data from the analysis model. The analysis model consists only of the organizational-level variables; therefore, it is difficult to see individual-level variation. A multi-level analysis must be used to simultaneously examine individual-level and organizational-level variables. Third, there is a limitation regarding the use of the socioeconomic status (SES) indicators as control variables. Annual income per resident in the community where the schools were located was used as a proxy indicator of SES. However, this indicator does not represent the annual income per family in the school district. Hence, a variable of family-level SES, rather than community-level SES, should be

used. Finally, several fitness indices of the indirect effects model in this research need improvement. A more elaborate model should be constructed to accurately and thoroughly describe the influence of family social capital on academic performance.

#### NOTES

1. Ministry of Education, Culture, Sports, Science and Technology (2011) *Research on issues over teacher guidance toward student's misbehavior – 2010*.
2. In all confirmatory factor analysis, we have applied the principal factor method and carried out the promax rotation.

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