Parent Networks as Determinants of Relational Trust

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INTRODUCTION

This study was conducted to clarify the effect of parent networks on the relational trust between parents and their children's school. Trust is an important foundation of effective schools (Tschannen-Moran, 2004). There are currently multiple schools that have set institutional visions such as "building strong trust relationships with parents." School administrators have perceived that building trust with parents is one of the most important issues facing schools. Indeed, several studies have indicated that trust between parents and schools is crucial to school improvement (e.g., Adams, Forsyth, & Mitchell, 2009; Forsyth, Adams, & Hoy, 2011; Hoy & Tschannen-Moran, 1999; Tschannen-Moran, 2004; Tsuyuguchi, 2012).

The concept of relational trust (Bryk & Schneider, 2002) is integral to the purpose of the present study. Indeed, an understanding of trust in a school requires the consideration of relational trust, which explains trust from the viewpoint of expectation and obligation (the definition of relational trust is described next section).

It is important to understand the determinants of relational trust between parents and schools. Previous studies have addressed the relation between parents and schools in the following views: (1) children's adaptation to the school; (2) family's socio-economic status or family structure; and (3) communication between parents and school teachers. The main focus of this study was to establish a framework to understand how parent networks are a determinant of relational trust. It was hypothesized that parent networks in the school community will have significant effects on the relational trust between parents and schools. If this hypothesis were confirmed, school organizations' trust-building strategies would require modifications. Furthermore, trust-building strategies would need to include parent networks as well as the networks between parents and the school. Thus, trust-building strategies would be difficult to carry out in the school organization alone. Indeed, in order to implement this strategy, the assistance from the Board of Education, including the Adult Education Department, would be required.

THEORETICAL FRAMEWORK AND RESEARCH QUESTIONS

Relational Trust

Trust is an important factor in the functioning of school organizations; thus, it has been emphasized in school settings. When trust exists, the need for additional supervision and behavioral control is minimized and costs are reduced. Furthermore, trust is a social phenomenon that has been identified empirically as an important component of civic engagement (Putman, 2000), organizational effectiveness, and school effectiveness (Adams et al., 2009; Bryk & Schneider, 2002; Forsyth, Barnet, & Adams, 2006; Forsyth et al., 2011; Goddard, Tschannen-Mora, & Hoy, 2001; Hoy &Tschannen-Moran, 1999)

Researchers claim that trust is important in social interactions and working relationships, but defining its constitutive elements is more difficult. Indeed, trust is an elusive construct. As Baier (1986) noted, its presence within social networks is like air: we only take notice when it is absent or scarce. The elusiveness of trust has also been illustrated in studies of social capital and community building (Putnam, 2000). Specifically, in these studies, the decline in political, religious, and civic participation, as well as workplace connectedness, is attributed to tenuous social bonds weakened by a lack of interpersonal trust. On the other

hand, the development of strong social bonds forms a type of trust that is the catalyst for effective interdependent relationships. Indeed, trust grows out of favorable and positive experiences.

Bryk and Schneider (2002) conceptualized relational trust as an organizational property based on Coleman's (1988, 1990) studies of social capital. Specifically, Bryk and Schneider (2002) extended the conceptualization of trust to school organizations. Their criteria for trust are similar to Hoy and Tschannen-Moran's (1999) criteria[1], but the terminology differed. Specifically, Bryk and Schneider referred to the terms: respect, competence, personal regard for others, and integrity.

Although there is some agreement on the constitutive properties of trust, the nature and form of trust differs across organizational settings. Bryk and Schneider's (2002) explanations of organic and contractual trust are especially useful for understanding school trust. Organic trust is characterized by dense relationships and faith in the mission of an organization. It is qualitatively different from other types of trust in that perceptions are based on the degree to which individual and group ideologies converge around a core set of beliefs.

On the other hand, contractual trust (Bryk & Schneider, 2002) is theoretically similar to early conceptual frameworks that defined trust as an expectation. Trust emerges from the confidence in knowing that if one party does not uphold an agreement, there is cause for redress. Additionally, behavior and outcomes are easily monitored to determine if a breach in the contract has occurred. However, to understand the trust relationship between parents and schools, both perspectives of expectations and a sense of obligation need to be addressed. It is not appropriate that parents who have high expectations for the school, but feel low levels of obligation to the school are included to parents who have trust relationship with their school. Moreover, when parent support is low, it is more difficult for schools to effectively educate children; yet, parents are dependent on schools to help prepare their children for future academic and personal success (Adams, *et al.*, 2009). Thus, it seems most appropriate to use the concept of relational trust, which is trust based on expectation and obligation, when examining the phenomenon of parental trust in schools.

Determinant Factors of Trust

Based on previous studies, it appears that there are three factors that determine trust between parents and their children's school teachers. One factor is children's learning and acclimatization to school activities; these factors are commonly measured by academic performance, attendance, and the sense of belonging to the school (Adams & Christenson, 2000; Adams, *et al.*, 2009). The findings from these studies suggest some important practices that could build trust. Specifically, schools should build a learning environment where students can concentrate on lessons that will foster academic performance. However, in a study in Japanese elementary and junior high schools (Tsuyuguchi, 2012), it was clarified that improving students' academic performance does not lead to parents' trust in schools. Improvement in academic performance is also affected by instruction in a Juku[2] in Japan. Thus, it is difficult to determine if academic performance is affected solely by instruction at school.

A second determinant factor of trust is social class, including race (Bryk & Schneider, 2002), socioeconomic status (Goddard et al., 2001), and family characteristics (Tsuyuguchi, 2012). For instance, in schools where a racial conflict occurs among teachers and where the ratio of African-American students is high, the trust relationship between parents and schools appears to decrease (Bryk & Schneider, 2002). Thus, there appears to be a negative relationship between trust and racial composition ratio.

On the other hand, in low-income neighborhoods, there is a lower probability of improvement in students' academic performance. This often results in teachers, parents, and students blaming one another for low academic achievement. This process impairs mutual trust between families and schools. Moreover, it often leads to lower academic performance, and can result in a negative spiral (Goddard *et al.*, 2001).

In addition, family characteristics affect the trust relationship between parents and schools (Tsuyuguchi, 2012). For instance, due to the time constraints of single parent families, they often do not have the time to participate in school activities and, therefore, they may become isolated from the school community. Moreover, single parents have difficulty understanding situations at schools because they do not participate. Thus, the building of relational trust between single parents and schools is difficult as a result of their time constraints.

A third factor is communication between parents and their children's school teachers. Previous research has indicated that there is a positive correlation between communication satisfaction and communication frequency (Adams & Christenson, 2000). Therefore, it could be that frequency of communication may lead to improvements in communication

satisfaction. Further, Tsuyuguchi (2012) has indicated that the communication process between parents and teachers is important in building relational trust. In this study, Tsuyuguchi (2012) isolated the aspects of the communication process that build relational trust; the following factors were important: whether parents recognized teachers' honesty and competency in the communication process, as well as whether parents felt a sense of fulfillment in the communication process. These variables explained 47% of the variance of the relational trust. Thus, in order to build relational trust, daily dialogue between parents and teachers is very important.

Parent Networks as Determinants of Trust

As aforementioned, mutual interaction between parents and teachers is an important determinant of building trust. However, mutual interaction does not explain all of the variance in models predicting the building of trust between parents and schools. Indeed, it seems that trust would be developed among parent networks, parent-community networks, and parent-teacher networks.

Since Coleman's (1988) study, there has been extensive research on the effect of education on parent networks. He focused on a closed network among parents, which is a situation where a parent knows most of the parents of his or her children's friends. This concept has been called "intergenerational closure." This study was conducted in Catholic schools; therefore, there is support from a religious community. This may explain the educational effects of intergenerational closure, as well as the low dropout rate in this community. In addition, several researchers have demonstrated that intergenerational closure reduces dropout (Carbonaro, 1998; Teachman, Paasch, & Carver, 1996). On the other hand, Desimone (1999) reported that one of the educational effects of parent networks was academic improvement. Thus, it may be that parent networks positively influence educational outcomes because meaningful information about education and instruction is distributed in parent networks. Therefore, parents who participate in networks receive meaningful information about teachers, friends, school policies, and instruction. Therefore, the information distributed in these groups influences academic achievement and reduces school dropout (Hoover-Dempsy, Bassler, & Brissie, 1987).

Thus, it appears that parent networks affect academic performance and dropout rates by sharing information, building an environment of reciprocity, and establishing mutual trust in the networks. However, Horvat, Weininger, and Lareau (2003) indicated that parent networks appear to

be prevalent in middle class communities. Moreover, they indicated that the educational effects of among parent networks has been observed in high SES communities, and may not translate to low SES communities. However, it is important to note that low SES parents participate in parent networks, but those networks may not be focused on the education of children. Furthermore, it is difficult to obtain meaningful information about homework management or problem solving for children in low SES communities (Delgado-Gaitan, 1992). Indeed, previous studies have suggested that researchers should focus on the quality of information that is distributed between parents, as well as whether the parents at the school know one another.

In addition, previous studies have indicated that parental participation in community networks has positive educational effects, including lowering dropout rates. In this body of work, transferring to another school (Aston & McLanahan, 1994; Hofferth, Boisjoly, & Duncan, 1998; Swanson & Schneider, 1999) and transferring to another residence (Furstenberg & Hughes, 1995; Smith, Beaulieu, & Israel, 1992; Swanson & Schneider, 1999; Tucker, Marx, & Long, 1998) served as a proxy variable for community networks. Therefore, this body of work is based on the assumption that belonging to a community where mobility is low, there are strong social ties. Thus, changing schools or residence would have a negative impact on children's educational activities, because it would disrupt the connection between parents and community.

However, the negative effects of changing schools or residence are not apparent in every family. Previous studies have found that the negative effects of mobility are moderated by family structure. For instance, the relation between school transfer and children's problem behavior is low in traditional families (Tucker *et al.*, 1998). On the other hand, Putnam (2000) set proxy variables of community networks including, the number of regional organizations to which they belonged, the frequency of participation in regional organizations or volunteer activities, and the attendance rate at the public meetings for schools and communities. Therefore, he conceptualized community networks as the affiliation and participation in regional organizations. Participation in community networks by parents has an effect on educational outcomes, including dropout rates. In a community where participation in civic activities by parents is encouraged, educational effects have been observed, including children's citizenship (Kahne & Sporte, 2008). Furthermore, Croll (2004) reported that parent behavior, such as joining regional organizations, being active

in organizations, and participation in religious volunteer experiences affected children's academic performance.

As aforementioned, a positive relationship between parents' involvement in community networks and educational outcomes has been reported in several studies. However, the relationship between the community networks and relational trust still requires clarification. Indeed, previous studies have suggested that the measure of parental involvement should focus on residential and school mobility, as well as parents' participation in community events when examining relational trust between parents and their children's school.

Analysis Model

Previous studies of trust have focused on the communication between parents and school teachers (Adams & Christenson, 2000; Hoy & Tschannen-Moran, 1999; Tsuyuguchi, 2012). These studies have indicated that parents and schools form positive evaluations of one another through interactive communication, and this is an important determinant of building trust. The investigations about the relationships between parent networks and educational outcomes have accumulated in studies of parent networks. However, there are few investigations about the effects of parent networks on building trust between parents and school teachers. Therefore, it seems necessary to organize the characteristics of parent networks. From previous works, it seems that the following three indicators could be used as characteristics of parent networks.

The first characteristic is intergeneration closure. Specifically, if children have established friendships, there are opportunities for mutual communication among the parents. As a result, a parent may know the parents of his or her children's friends; thus, intergenerational closure is formed. Therefore, we hypothesize that the mutual recognition relationship among parents would affect the building of trust with their children's school.

The second characteristic is the quality of information in the network. In a closed network, parents exchange information through meeting one another frequently; therefore, they have an increased sense of mutual expectations. In addition, norms in closed networks are formed through interactive communication among parents. As previous described, a closed network is not always effective for parents, and the quality of information flowing through the network is important. Therefore, in parent networks, it is important to ascertain if parents within the network discuss their children's education.

The third characteristic is a bridging phenomenon where the network participates in neighborhood events. Parent participation in neighborhood events would be a prime opportunity for socializing between parents and neighbors. Further, parents' participation in community events provides the opportunity for parents beyond the school, grade, and classroom level to socialize with one another. Therefore, neighborhood events have the potential to foster new ties encompassing a broader network than a parent network simply composed of parents of students from a single school.

Research Question

The majority of parents who are participating in parent networks would be actively involved in Parent Teacher Association (PTA) activities or school events. Therefore, we predicted that parents who are participating in networks would have the opportunity to understand the efforts and achievements of teachers, and would have high expectations for the school. Therefore, our research question was as follows: *Do parent networks affect relational trust between parents and the school teachers?* To clarify this research question, we followed three steps.

First, we created the relational trust variable and parent networks variable. We measured the relational trust variable by examining expectations and obligations via the methods employed by Bryk and Schneider (2002). In addition, we measured parent networks via the three previously noted methods: intergenerational closure, network for consultation among parents, and neighborhood network.

Second, we examined our model by controlling for several variables we hypothesized would be related to relational trust. The control variables were based on previous studies and included school characteristics, children's academic performance, family characteristics, and parents' evaluation of the school.

Finally, we constructed a multilevel model that included both individual-level variables[3] and group-level variables. Parent networks were both an individual-level variable and a group-level variable. Parent networks as an individual-level variable indicated the personal access to networks that are formed by parents. On the other hand, parent networks as a group-level variable indicated the degree of accumulation of parent networks within a school district. By using a multilevel modeling approach, we were able to clarify the effects of individual-level variables and group-level variables on relational trust.

METHOD

Data sources

The survey targeted all schools located in a city in West Japan (9 elementary schools and 8 junior high schools). The survey was conducted every February from 2008 to 2010. In addition, documents provided by the Board of Education were also included in the analysis. We distributed one questionnaire to each household where one or more children attended one of the targeted schools. The return rate was 69.5% (2,253/3,242) in 2008, 76.7% (2,336/3,046) in 2009, and 76.2% (2,427/3,184) in 2010.

Scale items

Relational trust. Relational trust was measured from the parents' perspective via Tsuyuguchi's (2007) 17-item scale. This scale was based on the concept of relational trust introduced by Bryk and Schneider (2002). Relational trust is measured from the dimensions of expectation (8 items) and obligational attitude towards cooperation (9 items). Items are listed in **Table 2**; items were rated on a four-point Likert scale (from "1" *strongly disagree* to "4" *strongly agree*). The expectation and obligation scores were multiplied to create the relational trust indicator. Means and standard deviations for these scales were as follows : expectation (M=2.96, SD=.58, α=.90), obligation (M=2.55, SD=.59, α=.89), and relational trust (M=7.72, SD=2.75).

Parent networks. Parent networks were measured via three items: intergenerational closure ("I know most of the parents of my children's friends"), network for consultation among parents ("I have consulted with other parents about the education of our children"), and neighborhood network ("I participate in community events"). Items were rated on a four-point Likert scale (from "1"= *strongly disagree* to "4"= *strongly agree*). A four-point Likert-type scale (from "1" *strongly disagree* to "4" *strongly agree*) was used in this measurement. The descriptive statistics are as follows: inter-generational closure (M=.55, SD=.50), network for consultation among parents (M=.52, SD=.50), and neighborhood network (M=.51, SD=.50). We adopted the ratio of positive respondents for each school as a school-level variable, and it yielded the following score: intergenerational closure (M=.55, SD=.10), network for consultation among parents (M=.52, SD=.06), and neighborhood networks (M=.51, SD= .10).

School evaluation. Parents' evaluation of the school was a control variable in the study and was measured via three items: learning environment ("I think the learning environment of the school is good"), teaching ability ("I think the teaching ability of the teachers is good"), and school improvement ("I think the school is improving"). Parents rated these items on a four-point Likert scale (from "1"= *strongly disagree* to "4"= *strongly agree*) and the average value of the three items was used. The descriptive statistics are as follows: individual level of school evaluation (M = .00, SD=.59, α=.86, after the centering), and school level of school evaluation (M=2.84, SD=.25).

Other characteristics. In addition, we also examined individual characteristics that may have a significant impact on relational trust between parents and school teachers. Specifically, we examined the effects of seven school-level characteristics: ratio of dual-income families (M=.57, SD=.08, dummy coded variable), ratio of one-parent families (M=.24, SD=.06, dummy coded variable), ratio of families receiving welfare (M=.06, SD=.03, dummy coded variable), ratio of children attending Juku (M=.29, M=.14, dummy coded variable), academic achievement test scores (M=92.58, SD=6.49, school average of Criterion Referenced Test in Japan), number of classes (M= 9.29, SD= 3.84), and school stage (M=.53, SD=.51, elementary=1, middle=0, dummy coded variable).

Analytic strategy

In the 1990s, multilevel modeling started to be used as a suitable method of analyzing multilevel data (Bryk & Raudenbush, 1992; Kreft & Leeuw, 1998). As statistical software packages have increased in volume, multilevel modeling approaches have been more widely used in the social sciences. Multilevel modeling has some advantages, including (1) the ability to simultaneously analyze the effect of both group-level and individual-level variables on a dependent variable, (2) the ability to verify the differences between groups, and (3) the ability to reduce several statistical fallacies[4] (e.g., ecological fallacy, atomistic fallacy, psychologistic fallacy, and sociologistic fallacy).

We examined the influence of parent networks (individual level) on the relational trust between parents and their children's school (individual level). The control variables (school level) of the analytical model comprised school evaluation, parent networks, and attribution variables. Since the school-level sample was small (N=17), we only used the school-level variables as controls.

Expectation, obligation, and relational trust were set as the dependent variables. First, we built *Model 0*, which did not introduce the explanatory variables.

Second, we built *Model 1* to only introduce the school-level variables. Finally, we built *Model 2* to introduce all explanatory variables (refer to the following formula).

M o d e l 0

$$Y_{ij} = (\gamma_{00} + \mu_{0j}) + \varepsilon_{ij,}$$

M o d e l 1

$$Y_{ij} = (\gamma_{00} + \mu_{0j}) + \gamma_{010}(\text{School Evaluation}) + \gamma_{020}(\text{Intergenerational Closure}) + \gamma_{030}(\text{Network for Consultation}) + \gamma_{040}(\text{Neighborhood Networks}) + \varepsilon_{ij,}$$

M o d e l 2

$$Y_{ij} = \{\gamma_{00} + \gamma_{01} (\text{Ratio of Dual-Income Families}) + \gamma_{02} (\text{Ratio of One-Parent Families}) + \gamma_{03} (\text{Ratio of Families Receiving Welfare}) + \gamma_{04} (\text{Ratio of Children Attending Juku}) + \gamma_{05} (\text{Academic Achievement Test Scores}) + \gamma_{06} (\text{Number of Classes}) + \gamma_{07} (\text{School Stage}) + \gamma_{08} (\text{School Evaluation}) + \gamma_{09} (\text{Intergenerational Closure}) + \gamma_{10} (\text{Network for Consultation}) + \gamma_{11} (\text{Neighborhood Networks}) + \mu_{0j}\} + \gamma_{010}(\text{School Evaluation}) + \gamma_{020} (\text{Intergenerational Closure}) + \gamma_{030}(\text{Network for Consultation}) + \gamma_{040}(\text{Neighborhood Networks}) + \varepsilon_{ij,}$$

> γ_{00} : intercept
> $\varepsilon_{ij.}$: error term of individual level
> μ_{0j} : error term of school level

RESULTS

Descriptive Statistics

We examined the effect of 15 independent variables on three dependent variables. The descriptive statistics for all 18 variables are displayed in **Table 1**. The correlation matrix for all 18 variables is displayed in **Appendix A**.

The results of a factor analysis (principal factor method, promax rotation) are displayed in **Table 2** for the relational trust measure composed of 17 items. *SPSS Base System ver. 19.0* was used to analyze the data. Importantly, the same factor structure was obtained across all three years of data collection. The first factor is obligation that was constructed by attitudes of the participation and cooperation for learning activities, school events, and PTA activities ("I want to participate in PTA activities as much as possible"). We adopted principal factor analysis and promax rotation as analytical methods. The second factor was expectation and was constructed by the attitudes of hope, intimacy, and

affection from the relationship between parents and school teachers. The main questions were as follows: "Teachers understand my concerns regarding education." For both, expectation and obligation, the α coefficient was more than the generally required level: expectation=.90 and obligation=.89. Therefore, this scale satisfied the required level of validity and reliability.

Multilevel Modeling

The results of the multilevel modeling analyses are displayed in **Table 3**; expectation, obligation, and relational trust were the dependent variables. *SPSS Advanced Model ver. 19.0* was used analyze the data.

First, we will describe the overall trends of the analysis. For *Model 0*, school variance was statistically significant in all models. Thus, it may be that the dependent variables may be explained by a variety of differences between groups. In *Model 1*, the individual-level variables are introduced into the model. Overall, several variables significantly affected the dependent variables. Therefore, relational trust (including expectation and cooperation) is explained by individual-level social ties surrounding parents. Finally, *Model 2* was the model that supplied both the individual- and group-level variables. If the ICC (Intraclass Correlation Coefficient) increased after the group-level variables were introduced, it would indicate that these variables explained the variance of dependent variables.

However, when *Model 1* and *Model 2* were compared, ICC did not increase. In addition, few independent variables had significant effects on the dependent variables. We confirmed that the group-level variables used in this analysis did not sufficiently explain the distribution of relational trust; few school-level independent variables significantly affected the dependent variables. In addition, the ICC was also very small: expectation = 5%, obligation = 0%, and relational trust = 1%. Thus, these results indicate that relational trust is explained by the variance between individuals in a school rather than the variance between schools.

Next, we describe the effects of each independent variable (individual and group level) on the dependent variables (expectation, cooperation, and relational trust), by focusing on *Model 2*.

Effects on Expectation

The analysis indicated that school evaluation ($\gamma = .60$, $p < .01$) and network for consultation ($\gamma = .11$, $p < .01$) as individual-level variables affect parents' expectations of the school. Parents'

TABLE 1. Descriptive Statistics

	M	SD	N items	α
Individual Level				
Expectation	2.96	.58	8	.90
Obligation	2.55	.59	9	.89
Relational Trust	7.72	2.75	—	—
School Evaluation	.00	.59	3	.86
Intergenerational Closure (Dummy)	.55	.50	1	—
Network for Consultation (Dummy)	.52	.50	1	—
Neighborhood Network (Dummy)	.51	.50	1	—
School Level				
Ratio of Dual-Income Families	.57	.08	—	—
Ratio of One-Parent Families	.24	.06	—	—
Ratio of Families Receiving Welfare	.06	.03	—	—
Ratio of Children Attending Juku	.29	.14	—	—
Academic Achievement Test Scores	92.58	6.49	—	—
Number of Classes	9.29	3.84	—	—
School Stage (Dummy)	.53	.51	—	—
School Evaluation	2.84	.25	3	—
Intergenerational Closure	.55	.10	1	—
Network for Consultation	.52	.06	1	—
Neighborhood Network	.51	.10	1	—

TABLE 2. Relational Trust Scale

	2008		2009		2010	
Items	I	II	I	II	I	II
· I want to participate in PTA activities as much as possible.	.878	-.089	.860	-.063	.871	-.069
· I think I cooperate in PTA activities.	.820	-.125	.829	-.149	.817	-.139
· I am pleased when the school requests my cooperation.	.759	.000	.756	.004	.762	.020
· I want to be a PTA officer.	.726	-.041	.769	-.051	.752	-.039
· I think that I actively participate in school events.	.694	.027	.704	.007	.713	-.022
· I intend to cooperate as a volunteer if the schools so requests.	.634	.183	.609	.193	.631	.170
· I want to use my abilities to help with school activities .	.590	.067	.601	.062	.572	.107
· I want to participate in school events as much as possible.	.583	.097	.585	.131	.574	.104
· I have carefully read the information papers from the school.	.302	.131	.311	.161	.281	.226
· Teachers understand my concerns regarding education.	-.115	.879	-.105	.876	-.105	.877
· I have shared my concerns regarding education with my children.	-.023	.837	-.014	.831	-.041	.846
· Teachers are inclined to listen to our opinions.	-.045	.784	-.056	.779	-.018	.755
· When I have some troubles or concerns, I consult the teachers.	.033	.737	.033	.722	.012	.757
· I experience a feeling of familiarity with the school teachers.	.026	.710	.011	.706	.017	.697
· I expect the school to improve academic achievement.	.047	.645	.051	.659	.044	.644
· I expect the school to facilitate education or health education.	.070	.623	.050	.635	.050	.625
· I feel an attachment to the school my children attend.	.252	.464	.238	.474	.260	.451

Note. N: 2008 = 2,253.   2009 = 2,336.   2010 = 2,427.

Correlation coefficient between factors: 2008= .464.   2009 = .462.   2010 = .467.

TABLE 3. Multilevel Modeling

	Expectation			Obligation			Relational Trust		
	Model 0	Model 1	Model 2	Model 0	Model 1	Model 2	Model 0	Model 1	Model 2
γ_{00} **Intercept**	2.94**	3.02**	3.12*	2.56**	2.94**	3.37**	7.70**	9.02**	10.74*
Level 1: Individual Level									
γ_{010} School Evaluation		.60**	.60**		.26**	.28**		2.21**	2.21**
γ_{020} Intergenerational Closure (D)		.01	.01		.13**	.13**		.44**	.44**
γ_{030} Network for Consultation (D)		.11**	.11**		.23**	.23**		.97**	.98**
γ_{040} Neighborhood Network (D)		.03	.02		.38**	.38**		1.19**	1.18**
Level 2: School Level									
γ_{01} Ratio of Dual-Income Families			-.08			-.02			-.07
γ_{02} Ratio of One-Parent Families			.45			.73			3.32
γ_{03} Ratio of Families Receiving Welfare			-.36			1.27			2.57
γ_{04} Ratio of Children Attending Juku			-.24			.40			.51
γ_{05} Academic Achievement Test Scores			-.02			.00			-.05
γ_{06} Number of Classes			.04			.01			.12
γ_{07} School Stage			-.04			.18*			.47
γ_{08} School Evaluation			.50			-.18			.79
γ_{09} Intergenerational Closure			.77			-.03			1.72
γ_{10} Network for Consultation			-.37			-.26			-1.34
γ_{11} Neighborhood Network			.26			.80*			3.09
Within-School variance	.31**	.17**	.18**	.34**	.22	.22**	7.28**	4.02**	4.02**
Between-School Variance	.02*	.02	.01	.01*	.00	.00	.32*	.24*	.05
ICC	.06	.12	.05	.03	.01	.00	.04	.06	.01
-2LL	4101.39	2715.26	2705.80	4278.43	3205.78	3213.54	11670.63	10250.88	10212.61
AIC	4105.39	2719.26	2709.80	4282.43	3209.78	3217.54	11674.63	10254.88	10216.61

Note. FY 2010 data: School level ($N = 17$), Individual Level ($N = 2,427$). * $p < .05$; ** $p < .01$. (D) = Dummy Variable.

expectations of the school are fostered through forming positive images about teachers' instruction and leadership when parents and teachers interact. In addition, participation in a mutual consultation network among parents had a significant impact on improving expectations for their school. Parents with relatively high interest in education had a tendency to participate in parent networks that are formed with the purpose of discussing children's education. As aforementioned, parents who participate in networks often visit their children's school; in addition, they are actively involved in the PTA and school events. Thus, their expectations for their children's school would be enhanced by stacking interactions with teachers when they visit the school; moreover, they would be more likely to understand the efforts of teachers and the policies of a school.

On the other hand, the effects of school-level variables on parents' expectations for their children's schools were not observed. In addition, parents' expectations for their children's school were not affected by family structure characteristics and the economic conditions of the school district. Thus, parental expectations would be enhanced by connecting the parents in the school district; in addition, it would also be improved by promoting understanding about teachers' effort and performance through mutual interaction between parents and teachers.

Effects on Obligation

The analysis indicated that four individual-level variables-school evaluation ($\gamma=.28$, $p<.01$), intergenerational closure ($\gamma=.13$, $p<.01$), network for consultation ($\gamma=.23$, $p<.01$), and neighborhood network ($\gamma=.38$, $p<.01$) -affected parents' obligational attitudes towards cooperation with the school. Positive evaluations of the school, formed through daily interaction between parents and teachers, significantly

affected cooperative attitudes. Parents who perceived teachers' effort and performance demonstrated cooperative attitudes toward school activities. This is likely due to the fact that parents perceive that the teachers are working hard, and, thus, believe they should also do something for that teacher. On the other hand, parents who participated in parent networks form ties among other parents; these networks collectively form attitudes about their school. The norms that are generated in these parental networks indicate that parents engage in altruistic acts for children, schools, and communities; they also indicate cooperative norms where the value of working together and supporting one another is valued. Parents who internalize these positive norms appear to indicate cooperative attitudes toward their school.

In addition, it was observed that school-level variables (school stage; γ=.18, $p < .05$, neighborhood network, γ=.80, $p < .05$) had an effect on obligational attitudes for a school. In a school district where a number of parents are participating in community events, many parents indicated cooperative attitudes about their school. Thus, it could be that parents' attitudes about cooperation for a school is affected by community norms such as "we have to participate in community events," rather than socio-economic status factors. In addition, the results indicated that cooperative attitudes in the elementary school district were higher than in the middle school district.

Effects on Relational Trust

The results indicated that four individual-level variables-school evaluation (γ=2.21, $p < .01$), intergenerational closure (γ=.44, $p < .01$), network for consultation (γ=.98, $p < .01$), and neighborhood network (γ=1.18, $p < .01$)-affected relational trust, which was the product of expectation and obligation.

First, positive evaluation of a school, which is formed through daily interaction between parents and teachers, had a significant effect on relational trust. This result is similar to those of previous studies (Adams & Christenson, 2000; Hoy & Tschannen-Moran, 1999; Tsuyuguchi, 2012).

Second, relational trust is affected by parents' participation in parent networks-intergenerational closure, network for consultation, and neighborhood community network. Thus, parent participation in the network had an effect on the level of relational trust. A parent who built a trusting relationship with teachers participated in parent networks. If this is interpreted from the opposite side, this result indicates that a parent who is isolated from parent networks will have difficulty building relational trust with teachers.

In light of the research findings of Bryk and Schneider

(2002), it appears that building a trust relationship between parents and teachers is difficult in low SES districts and those districts with increasing numbers of non-traditional families. However, the findings from the current study indicate that SES and family structure characteristics at the district level do not affect the trust relationship between parents and teachers. Furthermore, the results also indicated that overcoming the difficulties that have arisen at the district level; it is possible for parents to recognize teachers' effort and performance and, thus, build parent networks.

DISCUSSION

The purpose of this study was to clarify the effects of parent networks on relational trust between parents and their children's school. A multilevel model analysis (**Table 3**) indicated the following results.

First, we found that positive evaluation by parents formed by daily interaction influenced relational trust. School evaluation was included as a control variable, but the effects cannot be ignored. If a school did not provide information about the efforts and achievements of the school to parents, building relational trust was difficult. Further, if the efforts and achievements of the school were not visible to the parents, they would reduce the expectations and cooperative attitudes toward the school. Therefore, we suggest that a school evaluation index should be developed. This index should be constructed from the effective learning environment, teachers' teaching abilities, and continual school improvement. Information related to this indicator would be in high demand by parents. This would allow parents to be able to access this information; thus, the school should use a variety of methods and opportunities to provide it.

Second, we found that parent networks influenced relational trust between parents and the school. Indeed, in order to establish trust relationships between parents and school, it is important for parents to join parent networks. The following network types were included herein: intergenerational closure, participation in network for consultation among parents, and participation in neighborhood networks. Intergenerational closures are the networks that are formed when parents participate in networks that were formed by relationships among their children. Participation in parent networks indicates that parents are participating in networks where they engage in mutual consultation about their children's education. Participation in community events indicates that parents are participating in networks that consist of various people in

their region beyond the closed networks such as the friends, classroom, and grade. Thus, we have obtained strategic view points from the results that indicate that the connections between the parents as well as the connections between the parents and the community are effective in building trust between parents and schools.

Even in a school with a goal of building trust between parents and the school, the perspective of connecting the school and parents to one another is rarely shown. Studies that have examined how to build ties between parents or to build ties between parents and community members are few. However, Tsuyuguchi (2012) suggested that regular class meetings and safety management activities are effective ways to build ties among parents, and between parents and the community . If school administrators do not believe in fostering connections between parents, parents may be isolated from one another.

In addition, the results indicated that parents who participated in parent networks had a tendency to trust their school. On the other hand, parents who were isolated from parent networks had the tendency not to trust their school. School administrators should look more closely at the parents who do not participate in parent networks.

Parents may be isolated from other parents in the school community for various reasons, including changes in affiliation after changing schools or moving, reduced time to invest in networks due to work obligations, and economic reasons in their family (Turney & Kao, 2009). In addition to these factors, the isolation phenomenon may also be the result of parents' own school experiences in elementary and junior high school (Mitsubishi Research Institute, 2011). Specifically, if a person grew up without building good relationships with teachers or friends during the school age years, he/she may be less likely to build these relationships and to participate in networks in adulthood. Indeed, history of school failure may induce a parent's current isolation. As a result, parents' isolation inhibits the building of trust between parents and schools.

Third, it appears that family structure characteristics and socioeconomic status do not significantly affect relational trust. Relational trust was not significantly correlated with the ratio of families receiving welfare; it was also not significantly related to the ratio of one-parent families (**Table 2**). Thus, even if the district had a high proportion of one-parent families and low SES families, parents relation with their school was not negative. Although the generalizability of this finding is limited to the target city, it is important since these factors do not appear to directly affect the formation of

relational trust between parents and schools. On the other hand, the family structure characteristics and the economic characteristics of the district were negatively correlated with intergenerational closure, participation in networks for consultation among parents, and participation in neighborhood networks (**Table 2**). Thus, we could interpret that the district characteristics had direct effects on the building of parent networks that contributed to the building of relational trust between parents and the school. According to the results, we could interpret that the district characteristics affected relational trust, but the effects were mediated by parent networks. In other words, the relationship between the economic and family characteristics at the district level and relational trust may have been mediated by parent networks that surround the parents.

LIMITATION AND FUTURE RESEARCH

In this final section, we will discuss the limitations of this study and offer directions for future research.

First, the study was limited by a sampling issue. Specifically, we collected an adequate amount of individual-level data, but the school-level data was small. Sampson, Morenoff, and Gannnon-Rowley (2002) reviewed papers on neighborhood effects on crime that used multilevel modeling. They reported that the minimum number of group-level samples was twenty. The multilevel model in this study was not intended to actively discuss the effects of the group-level variables. Indeed, the multilevel approach was taken to set group-level variables as control variables in order to avoid a psychologistic fallacy. However, a limited sample size may result in questionable results. In the future, we plan to increase the school sample by asking for cooperation from neighboring school boards.

Second, there was a lack of individual attribution data in the current study. In Japan, the Board of Education does not actively collect information about family structure, socioeconomic status, and moving residences. This pattern is also true for the Board of Education in this target area. In modern Japanese society, the protection of personal information is overemphasized; therefore, the collection of parents' attribute information is very difficult. However, we aim to improve the accuracy of the analytical model by explaining the rationale to the Board of Education and to parents in order to collect individual attribute data.

Third, this study did not take a qualitative approach. This indicated that the construction of parent networks affected relational trust between parents and the school. Future

research should examine the practical ways to build parental networks. Thus, qualitative research is needed. Qualitative research that is targeted within schools is not adequate to clarify how parental networks are built. Indeed, it seems necessary to base this research on the results of studies where themes of social education, urban planning, and region development have been generated.

NOTES

1. Hoy & Tschannen-Moran (1990) define trust as a willingness to be vulnerable based on the belief that the other party is open, honest, reliable, competent, and honest. This definition is multidisciplinary, which integrates psychological and sociological properties found within a broad literature. 2. Juku is a private educational institution that supplements regular school study. Since Japanese schools teach uniform content at fixed rates, students who are unable to follow the lessons and, conversely, students aiming for high-level schools find it necessary to study at a Juku. The Juku has now become indispensable as a supplement to public education. 3. In this paper, we would express each family as an individual-level variable.

4. The four types of statistical fallacies have been defined as follows (Diez-Roux, 1998): ecologic fallacy is a fallacy caused by making individual-level inferences based on group-level analysis; atomistic fallacy is a fallacy caused by making group-level inferences based on individual-level analysis; psychologistic fallacy is a fallacy caused by making individual-level inferences based on individual-level analysis without considering group-level effects; and sociologistic fallacy is a fallacy caused by making group-level inferences based on group-level analysis without considering individual-level effects. It could be said that the multilevel modeling is a very effective way to avoid these statistical fallacies.

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REFERENCES

Adams, K.S., & Christenson, S.L. (2000). Trust and the family-school relationship examination of parent-teacher differences in elementary and secondary grades. *Journal of School Psychology*, 38 (5), 477-497.

Adams, C.M., Forsyth, P.B., & Mitchell, R.M. (2009). The formation of parent-school trust: A multi-level analysis. *Educational Administration Quarterly*, 45(1), 4-33.

Aston, N.M., & McLanahan, S.S. (1994). Family structure, residential mobility, and school dropout: A research note. *Demography*, 31(4), 575-584.

Baier, A. (1986). Trust and antitrust. *Ethics*, 96, 231-260.

Bryk, A.S., & Raudenbush, S.W. (1992). *Hierarchical Linear Models: Applications and Analysis Methods*. Sage Pub, CA.

Bryk, A.S., & Schneider, B. (2002). *Trust in Schools: A Core Resource for Improvement*. Russell Sage Foundation, NY.

Carbonaro, W.J. (1998). A little help from my friend's parents: Intergenerational closure and educational outcomes. *Sociology of Education*, 71(4), 295-313.

Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95-120.

Coleman, J. S. (1990). *Foundations of Social Theory*. Harvard University Press, MA.

Croll, P. (2004). Families, social capital and educational outcomes. *British Journal of Educational Studies*, 52(4), 390-416.

Delgado-Gaitan, C. (1992).School matters in the Mexican-American home: Socializing children to education. *American Educational Research Journal*, 29, 495-513.

Desimone, L. (1999). Linking parent involvement with student achievement: Do race and income matter? *The Journal of Educational Research*, 93(1), 11-29.

Diez-Roux, A.V. (1998). Bridging context back into epidemiology: Variables and fallacies in multilevel analysis. *American Journal of Public Health*, 88, 216-222.

Forsyth, P.B., Adams, C.M., & Hoy, W.K. (2011). *Collective Trust: Why Schools Can't Improve Without It*. Teachers College Press, NY.

Forsyth, P., Barnet, L., & Adams, C. (2006). Trust-effectiveness patterns in schools. *Journal of Educational Administration Quarterly*, 44(2), 122-141.

Furstenberg, F.F., & Hughes, M.E. (1995). Social capital and successful development among at-risk youth. *Journal of Marriage and the Family*, 57, 580-592.

Goddard, R.D., Tschannen-Moran, M., & Hoy, W.K. (2001). A multilevel examination and effects of teacher trust in students and parents in urban elementary schools. *The Elementary School Journal*, 102(1), 3-17.

Hofferth, S. L., Boisjoly, J., & Duncan, G.J. (1998). Parents' extrafamilial resources and children's school attainment. *Sociology of Education*, 71(3), 246-268

Hoover-Dempsey, K.V., Bassler, O.C., & Brissie, J.S. (1987). Parent involvement: Contributions of teacher efficacy, school socioeconomic status, and other school characteristics. *American Educational Research Journal*, 24(3), 417-435.

Horvat, E.M., Weininger, E.B., & Lareau, A. (2003). From social ties to social capital: Class differences in the relations between schools and parent networks. *American Educational Research Journal*, 40(2), 319-351.

Hoy, W.K., & Tschannen-Moran, M. (1999). Five faces of trust: An empirical confirmation in urban elementary schools. *Journal of School Leadership*, 9, 184-208.

Kahne, J.E., & Sporte, S.E. (2008). Developing citizens: The impact of civic learning opportunities on student's commitment to civic participation. *American Educational Research Journal*, 45(3), 738-766.

Kreft, I., & Leeuw, J. D. (1998). *Introducing Multilevel Modeling*. Sage Pub., London.

Mitsubishi Research Institute (2011). *A research on the impact of educational investment on social capital.* http://www.mext.go.jp/a_menu/kyoikuhi/chousa/1307886.htm 2014.2.7

Putnam , R.D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster Paperbacks, NY.

Sampson, R.J., Morenoff, J.D., & Gannnon-Rowley, T. (2002) . Assessing "neighborhood effects": Social processes and new directions in research . *Annual Review of Sociology*, 28, 443-478.

Smith, M.H., Beaulieu, L.J., & Israel, G.D. (1992). Effects of human capital and social capital on dropping out of high school in the south. *Journal of Research in Rural Education*, 8(1), 75-87.

Swanson, C.B., & Schneider, B. (1999). Students on the move: Residential and educational mobility in America's schools. *Sociology of Education*, 72, 54-67.

Teachman, J.D., Paasch, K., & Carver, K. (1996). Social capital and the generation of human capital. *Social Forces*, 75(4), 1343-1359.

Tschannen-Moran, M. (2004). *Trust Matters: Leadership for Successful Schools.* Jossey-Bass, San Francisco.

Tsuyuguchi, K. (2007). An analysis of parent segmentation as a public school: A case study of the suburban elementary school. *Journal of the Japanese Association for the Study of Educational Administration*, 49, 67-82.

Tsuyuguchi, K. (2012). *Trust in School Organizations*. University Education Press, Japan.

Tucker, C.J., Marx, J. & Long, L. (1998). Moving on: Residential mobility and children's school lives. *Sociology of Education*, 71, 111-129.

Turney, K., & Kao, G. (2009). Barriers to school improvement: Are immigrant parents disadvantaged? *The Journal of Educational Research*, 102(4), 257-271.

Appendix A. Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Individual Level																	
1. Expectation																	
2. Obligation	.45**																
3. Relational Trust	.82**	.88**															
4. School Evaluation	.64**	.37**	.56**														
5. Intergenerational Closure (Dummy)	.17**	.34**	.30**	.17**													
6. Network for Consultation (Dummy)	.22**	.41**	.37**	.17**	.44**												
7. Neighborhood Network (Dummy)	.17**	.48**	.39**	.19**	.29**	.35**											
School Level																	
8. Ratio of Dual-Income Families	-.06**	-.06**	-.07**	-.03	-.06**	-.05*	-.05*										
9. Ratio of One-Parent Families	-.03	-.02	-.03	-.12**	-.06**	-.05*	-.11**	-.10**									
10. Ratio of Families Receiving Welfare	-.02	-.01	-.02	-.03	-.02	.02	-.07**	-.04*	.79**								
11. Ratio of Children Attending Juku	-.10**	-.02	-.07**	-.07**	.07**	.05*	-.27**	-.55**	-.37**	-.18							
12. Academic Achievement Test Scores	.17**	.07**	.13**	.32**	.03	.02	.02	-.43**	-.39**	-.18	-.38**						
13. Number of Classes	.16**	-.01	.08**	.18**	-.12**	-.04	-.04	.05*	-.32**	-.32**	-.65**	.58**					
14. School Stage (Dummy)	.17**	.06**	.13**	.27**	.07**	.03	-.01	.13**	-.03	-.03	-.18**	.64**	.72**				
15. School Evaluation	.20**	.08**	.16**	.39**	.02	.02	.09**	-.08**	-.32**	-.18**	-.07**	.83**	.45**	.69**			
16. Intergenerational Closure	.00	.09**	.06**	.03	.20**	.09**	.14**	-.31**	-.21**	.00	.30**	.05*	-.61**	.37**	.07**		
17. Network for Consultation	.04	.10**	.08**	.05**	.15**	.11**	.14**	-.54**	-.36**	-.19**	.47**	.12**	-.30**	-.30**	.13**	.79**	
18. Neighborhood Network	.09**	.14**	.14**	.16**	.15**	.07**	.19**	-.30**	-.44**	-.31**	.20**	.40**	-.19**	-.03	.41**	.76**	.76**

Note. FY 2010 data: School Level (N = 17), Individual Level (N = 2,427). $^*p < .05$, $^{**}p < .01$. Cronbach's α: Expectation = .90, Obligation = .89, School Evaluation = .86.

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