

# Exploring the Factors Associated with the Survey Participation of Parents: Does a Cooperation Reward Increase Their Response Rate?

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**Background:** In the case of survey research, it is important to consider the sampling method and increase response rates for the survey to enhance the representativeness of the surveyed sample. Of several strategies, a monetary incentive has been widely known as the most effective way to increase response rates. However, this finding has been derived mainly from social surveys in the western countries, and little is known about the difference in response rates with and without a monetary incentive in the field of school health research.

**Objective:** This study aimed to clarify the influence of cooperation reward and other related factors on the response rate of a parent survey.

**Methods:** From late September to early October of 2016, a self-administered questionnaire survey was conducted for 5<sup>th</sup>- and 6<sup>th</sup>-grade students and their homeroom teachers in eight public elementary schools as well as their parents in six schools in four areas of A prefecture. In the student survey, a questionnaire was distributed by the homeroom teachers, responded to by the students in the class, and collected in individual envelopes after sealing. In the parent survey, students brought survey forms and two envelopes home to their fathers and mothers, and their parents individually completed the surveys and sealed the envelopes, and the students brought them to school. In addition, except for some elementary schools, we prepared a “Quo-Card” for a cooperation reward.

**Results:** Of the parent surveys conducted with 434 families in 6 elementary schools, both or either father or mother of 278 families cooperated (64%). The response rate in the survey was 78% (195/249) with a cooperation incentive and 45% (83/185) without it, yielding a significant difference ( $\chi^2 = 51.58, p < .001$ ). Combined with the gender of the homeroom teacher, there was no gender difference in response rate when there was a cooperation reward (78% for both), but a significant gender difference was found (34% for male, 65% female) when without it. Some student-level variables significantly correlated with response rate survey cooperation could be regarded as reflecting the situation of well-adjusted students, such as satisfaction with study, fewer academic stressors, and stressors from/with friends, among others.

**Conclusion:** The response rate improved by about 30% with a cooperation reward, but the influence of teacher's instruction and some other factors could not be ignored.

**Keywords:** questionnaire survey, parents, response rate, elementary school, cooperation reward

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## I. Introduction

In survey research, representativeness is very important. Thus, it is crucial to consider the appropriate sampling strategy and increase the response rate of the participant candidates<sup>1-3</sup>). However, there has been a consistent tendency of decreasing response rates in

population-based survey<sup>4-6</sup>). Survey researchers therefore have made a greater attempt to increase response rates by means of various strategies, such as shortening the survey length, personalized cover letters, the use of colored ink, monetary incentives, prepaid incentive, inclusion of return postage with stamp, and others<sup>6-9</sup>). Of these strategies, incentive use, particularly prepaid monetary

incentive, is widely recognized as an effective means to increase response rate<sup>5) 6) 10) 11)</sup>. Such monetary incentives for cooperation have also been adopted in large-scale population surveys in Europe, the US, and Japan<sup>7) 12-14)</sup>.

In the school settings, many surveys planned by public institutions and municipal board of education (“public surveys”) have been conducted not only for children but also for parents<sup>15-19)</sup>. However, for surveys by researchers at universities and from other academic disciplines (“private surveys”) in Japan, it is not necessarily common to ask parents for cooperation. The reason is unknown, but it seems to be because the school teachers, particularly school principals, tend to be reluctant to cooperate with parent surveys. Compared to surveys by public institutions, survey instruments constructed by university researchers tend to consist of many psychosocial questions such as parenting attitudes and family relations in which the contents are somewhat complicated and judged by social norms and values. In general, school teachers are sensitive to the relationship with parents, and, to avoid unnecessary conflict, it is common not to take a survey that touches on delicate issues. Private surveys at schools are of great significance by investigating contents that public surveys do not grasp, though some questions, which contains sensitive issues, have a risk of decreasing the response rates.

It is not common to use a cooperation reward in school-based “public surveys” for parents<sup>19) 20)</sup>, which are usually distributed and collected through their children. Although it has been considered that approximately 70% of response rates could be obtained in “public surveys” for parents in Japan<sup>20)</sup>, little is known about the difference in response rates with and without a monetary incentive in the field of school health research. This study examined this issue using “private survey” data on children’s behavior, school and home environment for children and parents, and children’s behavior for teachers. In our comprehensive questionnaire survey, parents in some schools were asked to cooperate to respond with a cooperation reward and parents in other schools were asked to do so voluntarily (without a cooperation reward) in accordance with requests by the school principal. Then, we tried to examine the abovementioned questions and other factors that could affect the response rate of parents.

## II. Methods

### 1. Request for cooperation with the survey

During June and July of 2016, we sent the documents of the survey overview to the school principals of 10 public elementary schools in four regions in A prefecture. We planned to collect the data from various geographical regions including urban, mountainous, rural, and islands areas, and thus we selected some elementary schools, where a school counselor, one of the collaborators in this project, has worked at or consulted with, located in such areas. We then visited these schools and met the school principals in order to explain the purpose, concept, question content, and data collection procedure of our survey. We spent a fair amount of time explaining why our survey included not only students but also parents and homeroom teachers since our primary purpose was to clarify the similarity/dissimilarity in evaluating the children’s behavioral problems between the children, parents and teachers. It has been commonly considered that a self-administered questionnaire is applicable to those who are 10 years old and over<sup>21)</sup>. Therefore, the 5<sup>th</sup>- and 6<sup>th</sup>-graders, aged 10-12 years old, were subjected to this survey.

At this stage, two school principals replied that they were unable to cooperate. The reason of one school was that the teachers were so busy because this school was selected as one of the applicable schools for lesson research participants, and the principal hesitated to ask them to participate in the survey. The reason of the other school was that it was a relatively large school located in an emerging residential area, so the parents were highly educated, which meant teachers should pay more attention to communication with parents. Additionally, the principal of the latter school could not fully grasp the situation of classroom teachers because of the first year of assignment as a school principal. Therefore, the agreement was obtained from eight schools including two urban, two mountainous, one rural, and three islands areas, while two school principals replied that the parent survey was impossible, and one of these schools cooperated with the survey only for 6<sup>th</sup>-graders.

Next, we asked the participating principals to explain the purpose of our survey and protocol to classroom teachers and asked for discussion and opinions on the research implementation, methodology, contents of question items, and so on. After the summer vacation, we distributed letters explaining the survey purpose to the 5<sup>th</sup>- and 6<sup>th</sup>-graders’ parents along with an explanation

of the objective and a document on the request for cooperation in the parent survey while accepting inquiries on the survey. Then, we confirmed that no one refused our investigation. We planned to prepare a prepaid card (“Quo-Card”) for parents as the cooperation reward, and proposed this plan to the principals of six elementary schools. The five principals permitted, but the remaining one did not. Accordingly, the document for the parents of the former five schools indicated that we would send a prepaid card (¥500) when a parent completed the questionnaire.

## 2. Survey procedure

From late September to early October, a survey was conducted using self-administered questionnaires for 5<sup>th</sup>- and 6<sup>th</sup>-grade students and classroom teachers in eight public elementary schools and parents of students in six out of eight schools in four regions of A prefecture. The same procedure was used for all schools.

a) Child survey: Homeroom teachers distributed the student questionnaires with envelopes and seal tape to their students in the class and explained the ethical matters such as that he/she did not have to respond to items to which he/she did not want to respond by reading the explaining statement in front of the students; these issues were also specified on the cover sheet of the questionnaire. The questionnaire consisted of the Japanese version of the Strength and Difficulties Questionnaire (SDQ)<sup>22) 23)</sup>; items related to lifestyle; and several scales measuring school stressor<sup>24)</sup>, social support<sup>25)</sup>, resilience<sup>26)</sup>, school and family environment, and others. After completing the questionnaire, each student sealed the questionnaire in her/his own envelope, which could reflect the confidentiality of responses.

b) Parent survey: Each student was handed the questionnaires for her/his mother and father and four envelopes (one small envelope to be used for sending back a prepaid card, two middle envelopes for mother’s and father’s questionnaires and one large envelope to contain these envelopes) to bring to her/his home. A small envelope was not entered for the students in one elementary school without a cooperation reward. A document for explaining the research objectives was also entered. The parent survey questionnaire consisted of the parent form SDQ and family relationships and atmosphere. The student’s father and mother individually completed the questionnaire and sealed it in a middle envelope separately and then sealed all of them in the large envelope. The student brought the large envelope

back to school. By securing the parents’ individual responses through the strategy mentioned above, we attempted to protect the responses within family members.

c) Teacher survey: Using the Japanese version of the SDQ, we asked homeroom teachers to evaluate each student’s situation at school. In schools with large class sizes, the abbreviated version of the SDQ was used due to the requests of the principals to reduce the teachers’ overload.

## 3. Statistical analyses

The analyses in this study aimed to search for variables related to the responders and non-responders to the parent survey. First, we examined the association between the parents with/without survey reply and the response/scale score to all the survey items. In relation to the parental responses to cooperation reward, homeroom teacher’s gender, and other categorical variables,  $\chi^2$  analysis was used, and the associations with continuous variables were based on Spearman’s rank-order correlation. Then, logistic regression analysis (stepwise selection) was executed by using variables significantly correlated in the explanatory analysis mentioned above, and ultimately, highly associated variables were extracted. SPSS version 24 was used for these analyses. G\*Power 3.1.9.2<sup>27)</sup> for Windows was used for the statistical power calculations on logistic regression analysis.

## 4. Ethical considerations

Participants were informed of the purpose and methods of this study in a letter expressing that their participation would be of their own free will and that refusal to participate would not result in any negative consequences. The participants were also informed that this study had no connection with the educational achievement and school activities. In our explaining letter, we informed the possibilities of the data obtained from the children and their parents to be used for academic purposes after anonymized. The questionnaire clearly stated that returning the questionnaire indicated consent. We followed the ethical principles for research with human subjects of the American Psychological Association<sup>28)</sup>. This study was approved by the ethical committee of Faculty of Psychological Sciences, Hiroshima International University.

**Table 1** Distribution of survey participants and non-participants by the presence/absence of cooperation reward

Student Surveyed	N	Parent Survey				Parent Responses														
		Not Surveyed* n	Surveyed n	Surveyed n	Surveyed n	Rewarded				Non-Rewarded										
						Both Mother and Father n (%)	Only Mother n (%)	Only Father n (%)	Neither n (%)	Surveyed n	Both Mother and Father n (%)	Only Mother n (%)	Only Father n (%)	Neither n (%)						
5th Graders																				
Girls	111	12	99	62	45 (73)	5 (8)	-	-	12 (19)	37	13 (35)	6 (16)	-	18 (49)						
Boys	128	14	114	63	44 (70)	6 (10)	-	-	13 (21)	51	16 (31)	2 (4)	-	33 (65)						
Total	239	26	213	125	89 (71)	11 (9)	-	-	25 (20)	88	29 (33)	8 (9)	-	51 (58)						
6th Graders																				
Girls	147	40	107	57	34 (60)	7 (12)	1 (2)	15 (26)	50	14 (28)	8 (16)	-	28 (56)							
Boys	155	41	114	67	42 (63)	9 (13)	2 (3)	14 (21)	47	22 (47)	2 (4)	-	23 (49)							
Total	302	81	221	124	76 (61)	16 (13)	3 (2)	29 (23)	97	36 (37)	10 (10)	-	51 (53)							
Total																				
Girls	258	52	206	119	79 (66)	12 (10)	1 (1)	27 (23)	87	27 (31)	14 (16)	-	46 (53)							
Boys	283	55	228	130	86 (66)	15 (12)	2 (2)	27 (21)	98	38 (39)	4 (4)	-	56 (57)							
Total	541	107	434	249	165 (66)	27 (11)	3 (1)	54 (22)	185	65 (35)	18 (10)	-	102 (55)							

\*Not Surveyed: Parent survey was not conducted due to request by the school.

### III. Results

#### 1. The survey participants—students, parent responders, and non-responders

Table 1 shows the grade and gender of students and their parents who did or did not respond. As already mentioned, we could not conduct the parent survey in one school for the 5<sup>th</sup>-graders and two schools for the 6<sup>th</sup>-graders. Therefore, the 5<sup>th</sup>-graders were from seven schools, and the 6<sup>th</sup>-graders were from eight schools. Of the 434 families of the six elementary schools surveyed, responses were obtained from 278 families (64%), including 230 (53%) from both parents. On the other hand, nonresponses from both parents counted 156 families (36%), nonresponses only from the father were 45 (10%), and nonresponses only from the mother were few.

#### 2. The differences in response rate of the parent survey by demographics of the students, cooperation reward, and gender of the homeroom teacher

We categorized a family as “non-responder” when both mother and father did not respond and “responder” when at least the mother or father responded. Table 2 shows responders and non-responders by grade and gender of the students, cooperation reward, and the gender of the homeroom teacher. No differences were found in response rate of the parental survey by grade and gender of the students. In contrast, significant differences in response rate were found according to with/without a cooperation reward ( $\chi^2 = 51.58, p < .001$ ); the response rate was 78% (195/249) when rewarded and 45% (83/185) when not rewarded. Additionally, when considering the homeroom teacher’s gender, significant differences were found in response rate ( $\chi^2 = 13.03, p < .001$ ); the response rate was 57% (141/248) when students were in the classes of male teachers and 74% (137/186) in the classes of female teachers.

Then, we further investigated the combination of these variables; there were no differences by the homeroom teacher’s gender while rewarded ( $\chi^2 = 0.01, n.s.$ ), but a large difference emerged without a reward ( $\chi^2 = 15.78, p < .001$ ). In the case of male homeroom teachers, the response rate was only 34% (42/122) while it was 65% (41/63) in the case of female teachers. Additional analysis on the differences in response rate with or without a cooperation reward by the homeroom teacher’s gender

yielded that the difference was pronounced in the case of male teachers ( $\chi^2 = 49.24, p < .001$ ) but not for female teachers ( $\chi^2 = 3.61, p = .057$ ). Analysis of variance for ratios after angular transformation<sup>29</sup> yielded a significant interaction effect of cooperation reward and gender of the homeroom teacher on the response rate ( $\chi^2 = 10.07, p < .002$ ).

**Table 2** Parent responders by student's gender and grade, cooperation reward and the gender of homeroom teacher

		Parent Survey				Total N	$\chi^2$
		Responders		Non-responders			
		n	(%)	n	(%)		
Total		278	(64)	156	(36)	434	
Grade & Gender							
Grade	5th Graders	137	(64)	76	(36)	213	0.01
	6th Graders	141	(64)	80	(36)	221	
Gender	Girls	133	(65)	73	(35)	206	0.04
	Boys	145	(64)	83	(36)	228	
5th Graders	Girls	69	(70)	30	(30)	99	2.33
	Boys	68	(60)	46	(40)	114	
6th Graders	Girls	64	(60)	43	(40)	107	1.43
	Boys	77	(68)	37	(33)	114	
Cooperation Reward & Gender of Homeroom Teacher							
Cooperation Reward	With	195	(78)	54	(22) <sup>b</sup>	249	51.58*
	Without	83	(45)	102	(55) <sup>a</sup>	185	
Homeroom Teacher	Female	137	(74)	49	(26) <sup>b</sup>	186	13.03*
	Male	141	(57)	107	(43) <sup>a</sup>	248	
Rewarded	Female Teacher	96	(78)	27	(22)	123	0.01
	Male Teacher	99	(79)	27	(21)	126	
No Rewarded	Female Teacher	41	(65)	22	(35) <sup>b</sup>	63	15.78*
	Male Teacher	42	(34)	80	(66) <sup>a</sup>	122	

\*:  $p < .001$  (also statistical power  $> 0.96$ )  
 a: Adjusted residual  $> 1.96$ , b: Adjusted residual  $< -1.96$

### 3. Exploration of variables related to response rate in parent survey

Using the item responses and psychological scale scores obtained from the child survey and school variables such as class size and demographics of homeroom teacher, Spearman's rank correlations were calculated with the parents' responses (responded/not responded = 1/0). **Table 3** shows the variables with significant correlations and the statistical power. A positive coefficient indicates that the higher the value is, the higher the response rate is, and a negative coefficient indicates the reverse. Of the variables at the student level, satisfaction with study, ambitious activities (resilience), and breakfast intake positively correlated with parent cooperation. In contrast, school stressors, such as academic stressors and stressors from/with friends, revealed negative correlation. Of the variables at the school/class level, the cooperation reward (rewarded/not rewarded = 1/0) and the homeroom teacher's gender (female/male = 1/0) showed positive correlations, and

the number of students in the class and working years of homeroom teacher in the current school showed negative correlations.

Finally, logistic regression analysis with stepwise selection was conducted using the variables significantly correlated with parent cooperation in individual analyses mentioned above, and four variables (three variables at the school/class level and one variable at the student level) were extracted as a final model (**Table 4**). Parents were more likely to cooperate when a cooperation reward was prepared and when their children's homeroom teacher was a woman. In contrast, parents were less likely to cooperate when the class size became larger and when their children felt more academic stressors. Post hoc power analysis<sup>27</sup> on the final logistic model of the cooperation reward as a main predictor with three covariates yielded its sufficient power (critical  $\chi^2 = 3.84, df = 1, \alpha = .05$ , statistical power = 0.95). In addition, we made an attempt to explore a possibility of multi-level analysis taking a class-level variation into consideration. However, the intra-class correlation of classroom was not large (0.043; 95%CI: 0.007 – 0.217), and the multi-level logistic regression model did not significantly increase the goodness-of-fit as compared to the individual-level logistic regression model (likelihood ratio test:  $\chi^2 = 2.59$ ,

**Table 3** Variables significantly correlated with parent survey participation

	Spearman's $\tau$	p	n
Student Level			
Satisfaction with Study	.145	.003	429
Ambitious Activities (Resilience)	.108	.025	433
Social Support from Teacher	.106	.030	418
Breakfast Intake (days/week)	.099	.042	425
Academic Stressors	-.152	.002	430
Stressors from/with Friends	-.106	.028	430
School/Class Level			
Cooperation Reward (with/without = 1/0)	.345	<.001	434
Gender of Homeroom Teacher (female/male = 1/0)	.173	<.001	434
Number of Students in the Class	-.291	<.001	434
Working Years of Homeroom Teacher in the School	-.113	.018	434

**Table 4** Variables associated with parent survey participation selected by stepwise logistic regression analysis

	OR	95%CI	p
School/Class Level			
Cooperation Reward (with/without = 1/0)	2.40	(1.40 - 4.12)	.001
Gender of Homeroom Teacher (female/male = 1/0)	1.83	(1.17 - 2.85)	.008
Number of Students in the Class	.93	(.88 - .98)	.005
Student Level			
Academic Stressors	.92	(.87 - .99)	.018

Cox-Snell  $R^2 = .17$ , Nagelkerke  $R^2 = .23$   
 OR: Odds Ratio, 95%CI: 95% Confidence Interval

$p = 0.054$ ). Accordingly, the result of the multi-level logistic regression was not presented here.

#### IV. Discussion

Before discussing the present findings, we should clarify the difference in the survey strategies between the general social surveys and school surveys. In many of the general social and marketing surveys (private surveys), excluding the census and some other public surveys, the subjects are selected by chance according to some selection procedure, and they often do not feel any specific connection to the research institution. So, they do not hesitate to ignore the survey. Therefore, various attempts are made to increase the response rate for the successful survey. Monetary reward is one of the typical attempts for cooperation<sup>(6) 10) 11)</sup>.

In school surveys, on the other hand, the surveys for children are done at school and the surveys for the parents are usually conducted through their children; i.e., the survey instruments are distributed and collected via children, resulting in a certain feel of obligation for the parents. Due to these features, a sufficient level of response rates<sup>20)</sup> can be expected, while parental surveys are mostly done by the public institution.

Private surveys in the field of school health usually employ the similar strategy, whereas parental surveys are seldom conducted. In private surveys for school health, we sometimes ask for relatively delicate psychosocial questions such as parenting attitudes and family relations. These types of questions might be difficult to answer for some parents, and also the parents may not feel that they should cooperate with the private survey. This would eventually lead to a considerable decline of response rate. If so, like the social and marketing surveys, any attempt should be made to increase response rate using cooperation reward. Unfortunately, even after the intensive academic database search, little empirical evidence is available on this topic. This provides the rationale for conducting the present study.

In this study, we explored the influence of monetary reward for cooperation and other related factors on the response rate of parents in a comprehensive survey of public elementary school students and their parents while homeroom teachers provided the information as well. We obtained expected and unexpected findings. First, as an expected finding, a substantial difference was observed in response rate of the parent survey with or without a cooperation reward—i.e., 78% vs. 45%, respectively (**Table 2**). In general, it would be said that

the representativeness of the survey sampling may be confirmed if the response rate above 60% or 70%<sup>(3) 7) 12)</sup>. Therefore, this type of cooperation reward (prepaid card) could be regarded as an effective way toward successful survey for the children's parents in a field of school health research.

Second, as an unexpected finding, the response rate of parents differed significantly by gender of the homeroom teacher; i.e., the response rate was 74% in female teacher's classes and 57% in male teacher's classes. Furthermore, considering the combination of these variables, the effect of gender of homeroom teacher became salient. In classes of female teachers, no differences were found in response rate of the parents with or without a cooperation reward while greater differences emerged in classes of male teachers; i.e., a cooperation reward was effective only for the classes of male teachers. As far as we know, this finding has never been reported anywhere, and, thus, this is the most remarkable finding obtained in the present study.

When calculating the response rates of parents by class only at the elementary school without cooperation reward, there was one female teacher's class each for 5<sup>th</sup>- and 6<sup>th</sup>-graders, and the response rates were 63.3% (19/30) and 66.7% (22/33), respectively. On the other hand, in classes of male teachers, the response rates were less than 1/3 in three out of four classes—i.e., 28.6% (8/28) and 33.3% (10/30) in the 5<sup>th</sup>-graders' classes and 28.1% (9/32) and 46.9% (15/32) in the 6<sup>th</sup>-graders' classes. In general, men are more likely to become non-responders compared to women in social surveys<sup>(4) 30)</sup>. This may suggest a general tendency that women would be more cooperative with this kind of activity and/or others' request from outside. It is plausible that female teachers might be more cooperative with the current survey for their students and parents, leading to the greater differences in response rates of parents by gender of homeroom teacher mentioned above.

Third, several student-level variables showing significant correlations with parent cooperation could be regarded as reflecting the situation of well-adjusted students (**Table 3**). That is, the students of cooperating parents were satisfied with study in school, held higher resilience, received more support from teachers, ate breakfast every morning, and felt fewer stressors from study and friends. We suppose that these students may often tell their parents about various matters at school, including communication with teachers and friends. It should be comfortable for the parents that their children could spend fruitful and stimulating time in school. Such

a situation might lead to their parents having increased affinity for school, giving them higher motivation to cooperate with any activities relevant to school.

On the other hand, for school/class-level variables, in addition to the cooperation reward and the gender of the homeroom teacher, more cooperation was found for parents of students in a smaller class and with homeroom teachers who worked a few years in the school (bottom half of **Table 3**). Class size might have a non-negligible effect on the class management of homeroom teachers. Probably, the homeroom teachers could afford to see individual students sufficiently with smaller classes, and, thus, smaller class size would make it easier for teachers to manage the students. This may partly coincide with the situation representing higher support from teacher. Additionally, if a teacher was new at the current school, she/he would attempt to know about their students and about the school, leading to a better teacher–student relationship. If a child felt close proximity to the teacher, the parent(s) would naturally have a similar affinity, resulting in cooperation with what the teacher announced.

The final model for survey cooperation of parents consisted of four variables: a cooperation reward, female homeroom teacher, smaller class size, and experiencing fewer academic stressors among their children (**Table 4**). Additionally, compared to male teachers, female teachers in this study had longer teaching careers but fewer years working at the current school, engaged smaller classes, and were more likely to provide support to the students, at least based on the students' responses. Although students' academic stressors did not differ by gender of the homeroom teachers, two other class-level variables were related to female teachers in this study.

Response rates among the parents of students of female homeroom teachers did not differ with or without a cooperation reward, which is one of the most salient findings. Therefore, though we should be conservative and not overestimate the current findings, at least based on this study, the researchers should ask female homeroom teachers to announce to their students to obtain higher response rates of parent surveys. We could not explain any reason for such an unexpected phenomenon. Thus, a further, larger study with suitable variables possibly explaining the differences between genders of homeroom teachers is needed to replicate our findings.

## V. Limitations

There exist several limitations in the present survey.

First, we could not conduct a random assignment of a reward condition to schools, and only one school was assigned as “voluntary” (unrewarded) participation, and it was decided by the school principal. And no information was available for the parents of these schools besides the questionnaire responses in our survey. It might be recognized that parents' cooperative attitudes toward school events/activities tend to decline as children's grade increases, while no previous research has addressed. Thus, response rates of parents would possibly vary by their children's grade. Even though the findings presented here were confirmed from a statistical point of view, we could not refute a critique that these should be obtained from parents of senior graders in particular schools. Further studies should be conducted using a random assignment of rewarded/unrewarded conditions to a sufficient number of schools and parents of various graders.

Second, family composition could not be checked in this study due to ethical considerations. Thus, even if the response by a father or mother was missing, we could not determine whether it reflected refusal/ignorance of response or unresponsiveness due to divorce or separation of the parents. We should note that the response rate of parents in the present study was an underestimated value because any divorce or separation case was also included in the non-response cases.

Third, the number of classes was too few for the appropriate execution of multi-level analysis. The data obviously consisted of multi-level structure including the individual-level and classroom/school-level variables. However, our attempt to conduct multi-level analysis could not be supported in this study. This might be possibly attributable to the fewer classes in our dataset—i.e., only 20 classes (14 classes with reward and six classes without reward).

Fourth, although it seemed that female teachers might be superior at least with respect to the issues relevant to the participation of parents to our survey, we did not have any data explaining it. Whether the gender of the teacher could be related to the response of parents should be further investigated with appropriate variables to determine the differences, if possible.

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- 2004- Professor, Hiroshima International University
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**Main Works:**

- "The usability of CAT system for assessing the depressive level of Japanese: a study on psychometric properties and response behavior," *International Journal of Behavioral Medicine* 23: 427-437, 2016. doi: 10.1007/s12529-015-9503-1
- "Differences in caregivers' psychological distress and associated factors by care recipients' gender and kinship," *Aging & Mental Health* 20: 1277-1285, 2016. doi: 10.1080/13607863.2015.1074161.
- "The effect of alternative scoring procedures on the measurement properties of a self-administered depression scale: an IRT investigation on the CES-D scale," *European Journal of Psychological Assessment* 35: 55-62, 2019. doi: 10.1027/1015-5759/a000371.

**Membership in Learned Societies:**

- The Japan Society of School Health
  - The Japan Public Health Association
  - The Japan Association of Job Stress Research
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