Determinants of School Attendance in 6841 Elementary School Students in Japan: a Structural Equation Model

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Abstract

Background: Managing school nonattendance is a priority worldwide. We aimed to explore students' feelings and perceptions about attending school and the potential determinants of a positive attitude towards attending school.

Methods: We hypothesized that a positive attitude towards attending school was influenced by positive relationships with friends and school teachers, positive perceptions of current circumstances, and positive subjective health. An original questionnaire was developed and distributed in Japan. To capture how children felt about attending school, the item wording was "I am looking forward to going to my school." To capture positive relationships with friends and school teachers, items were positively worded, including "I get along well with friends" and "school teachers approve of my efforts." To capture positive perceptions of current circumstances, items were positively worded, including "I am able to prepare for classes by my own" and "I am proud of myself." For positive subjective health, selected items were "my health status," "I get tired easily" and "I have anxieties and/or worries." We analyzed data from 6841 elementary school children in the 5th year in Japan using a structural equation model. We examined the model using the comparative fit index (CFI), Tucker Lewis index (TLI), and root mean square error of approximation (RMSEA).

Results: The final model obtained 0.055 for RMSEA, 0.933 for CFI, and 0.923 for TLI. Children's positive views towards attending school were directly related to positive relationships with friends and school teachers (the path coefficient value was 0.465), positive perception of current circumstances (0.074), and positive subjective health (0.187).

Conclusions: This study found that positive relationships with friends and school teachers were significantly and positively associated with children looking forward to attending school. Positive health status and a positive perception of current circumstances were also significant, but the relationship was not as strong.

Background

Regular school attendance precedes and is required for achievement and success in education. Managing school nonattendance is a core theme in education across the world. School can be a source of frustration for children, leading to avoidance behaviors, problematic relationships, stress, depression and a range of other negative outcomes [1–3].

In Japan, school nonattendance is defined by the state as nonattendance at school for a period of more than 30 days without a health or financial cause [4]. A recent nationwide survey identified more than 31,000 elementary school children who had not attended school for over 30 days (0.5% of the total school population) [4]. The major triggers were family issues (34.2%), relationships with friends at school (25.1%), and falling behind in lessons (19.6%) [4]. Contemporary practice for managing nonattendance focuses on emotional and practical support, as well as school-wide and teacher training. To reduce the rate of elementary school nonattendance, multiprofessional support is required. A project implemented in Japan monitored children from preschool to elementary school. The included professionals were kindergarten teachers, local government offices, and health professionals, including school psychologists and public health nurses [5]. Further projects in Japan have emphasized different aspects, such as oral health and identified risk factors for school nonattendance among elementary children [6].

Previous research has found that improving the social and emotional supportiveness of the school environment is key, including values related to inclusion, participation and peer support [4]. Explicit facilitation of peer-to-peer understanding and acceptance and play and friendships are recommended [7]. Having a positive peer relationship with classmates is important during the elementary school years. Elementary school children who are not liked by their classmates or who have no or only a few friends are at risk of bullying [8, 9] with associated emotional and behavioral needs [10–13].

Teachers can support mental health among elementary school children [14]. Thus, children's access to supportive adults, particularly teachers, is important [15–20]. However, school teachers are responsible for a wide range of students in the classroom and may not have the time or knowledge to provide individualized support. Specialist providers may also be required. School counselors are one such resource and have been newly introduced in Japan to support children [21]. In most cases, school counselors support children with more complex social, emotional or behavioral issues [21].

Japan also has some unique characteristics that may contribute to outcomes, including homogeneity, gender differences and social characteristics that may influence attendance. People in a homogeneous society, such as Japan are more likely to think and behave as other people in the group do. An elementary school child may feel different and/or be bullied or discriminated against because of perceived differences [22]. Additionally, there are various disparities between men and women, including opportunities for higher education and jobs, income and caring roles [23, 24]. Strong family or parental influence is also commonly observed in Asian countries. For instance, in Hong Kong, parents have lower initial expectations for daughters, whereas boys are expected to achieve excellent academic performance to prevent parental disappointment [25].

Research shows an important age effect. Nonattendance increases in the 4th or 5th year of primary elementary education [4]. It has been proposed that the introduction of abstract concepts and theory may be a factor [26]; however, the exact casual mechanism remains unknown.

There are state-run and private school in Japan. In both state and private schools, the rate of students with school nonattendance is increasing [4]. State schools adhere to government guidelines, while private schools may implement different policies. Nevertheless, in societies that value conformity and homogeneity, such as Japan, students are strongly encouraged to go to school, irrespective of their feelings or wishes. A recent nationwide survey revealed that 3.3% of 6450 elementary school students did not want to go to school [27]. The educational board in Saitama, Japan, located north of Tokyo, intended to explore whether the current implementation of strategies to reduce nonattendance was effective. The educational board wanted to explore students' feelings and perceptions about attending school and the potential determinants of a positive attitude towards attending school. There was no standardized instrument to measure how children felt about attending school. The school refusal assessment scale was proposed [28]; however, a Japanese version had not been

developed. Therefore, we developed a new model and questionnaire that described the potential determinants of positive perceptions towards attending school among elementary school students in state-run schools and explored the model in this research.

Methods

The current study was a cross-sectional study of elementary school children in the 5th year in state-run schools in Saitama, Japan. The research protocol was reviewed and approved by the Research Ethics Committee at Saitama Prefectural University (No. 19078).

Procedures

This study was conducted collaboratively between Saitama Prefectural University and the Saitama educational board. The measures described below were distributed to the children between April and December 2019. Each school district chose the periods for administration. Prior to distribution, school district officers visited the schools, described the aim of this survey to school teachers, and obtained agreement to conduct the survey. School district officers explained the aim and asked children to participate in a homeroom session while the school teachers facilitated students' group activities that were not relevant to the subjects or teaching. Data collection was completed by teachers in each classroom.

Participants

The educational board manages 802 state-run elementary schools (99% of total elementary schools) in Saitama. Those state-run elementary schools are grouped into 72 school districts matched to municipalities. We targeted 8 school districts (selecting 2 school districts from the southern, northern, western, and eastern areas). Chairpersons of the school districts provided permission to implement the survey.

Children begin elementary education at six years of age in Japan. Thus, elementary school children in the 5th year were either 10 or 11 years old during the data collection period. There were 8045 eligible children who were in the 5th year for this survey (Supplemental material Table). The district with small school numbers employed no school counselors. Unlike European countries with inclusive policies, children who require special support in school because of physical, psychological, and intellectual issues attend segregated special schools [4]. No school providing special education was included in this survey.

Hypothesized model

We hypothesized that a positive perception towards attending school was influenced by positive relationships with friends and school teachers, positive perceptions of current circumstances, positive subjective health, and having someone to share experiences and thoughts with (Fig. 1). To examine the model, an original questionnaire was developed through a collaboration between members of the Saitama educational board and faculty whose specialty was education. Several meetings took place between the members of the development team to finalize the questionnaire. Items were developed based on the literature, national guidelines and the expertise of the development team. It was strongly felt by the development team, given their experience working in and around schools, that a large number of questions would be a burden to the participants; thus, a shorter tool was desirable.

Data collection

There were 14 items in the original questionnaire. The first 13 items targeted intrapsychic and interpersonal determinants of positive perceptions towards attending school. The 14th item listed potential persons who were accessible for the participants to share their experiences.

To capture how children felt about attending school, the item wording was "I am looking forward to going to my school." The responses were 4 = strongly agree, 3 = agree, 2 = disagree, and 1 = strongly disagree.

To capture positive relationships with friends and school teachers, the following five items were positively worded: "I play with friends a lot," "I get along well with friends," "Other kids like me," "School teachers approve of my efforts" and "I am happy when talking to school teachers." For the five items, the responses were 3 = very much, 2 = a little bit, and 1 = not at all.

To capture the positive perceptions of current circumstances, the following four items were positively worded: "I am able to prepare for classes by my own," "I am proud of myself," "I am helpful to others" and "I believe my efforts will be rewarded." For the item about being able to prepare for classes independently, the responses were 4 = very well, 3 = fairly, 2 = poorly, and 1 = not at all. For other items, the responses were 3 = very much, 2 = a little bit, and 1 = not at all.

To capture subjective health, the following three items were employed: "My health status," "I get tired easily" and "I have anxieties and/or worries." For the general health status, the responses were 4 = good, 3 = fair, 2 = not very good, and 1 = not good at all. For the item for tiredness, the responses were 3 = not tired at all, 2 = sometimes tired, and 1 = frequently tired. For the item about anxieties and/or worries, the responses were 3 = no anxiety/worry at all, 2 = a little bit of anxiety/worry, and 1 = a lot of anxiety/worry.

To capture the persons with whom the children shared their experiences and thoughts as the 14th item, the following eight responses were selected: (a) my mother, (b) my father, (c) my siblings, (d) other family members/relatives, (e) school teachers, (f) a school counselor, (g) instructors of extracurricular activities, and (h) friends. The item also asked the participants the frequency of accessing those persons. The responses were 3 = frequently, 2 = sometimes, 1 = rarely, and 0 = there is no such person.

Data analysis

The statistical data analysis included descriptive statistics, Cramer's V, Spearman's rank correlation coefficient, and a structural equation model (SEM). The analysis was conducted with HAD 17.0 [29], SPSS v.26 for Japanese (IBM, Japan), and *M*plus version 7.3 [30].

Before conducting the SEM, we observed the data characteristics. Because the data were collected from 8 school districts, we explored individual-level variance and group-level (school district-level, in this study) variance [31]. Group homogeneity was identified with intraclass correlation coefficient (ICC). A high ICC results in a biased error variance in conventional regression models, overestimating the relationship between variables. An ICC of 0.25 and higher indicates that much of the variation in the dependent variables is due to the features of groups rather than the characteristics of individuals [32]. In our study, we employed a more conservative value of 0.05 [33] because we collected data from a large sample.

After confirming the ICC values, we observed sample descriptive data with individual-level variance. We compared boys and girls according to the survey items. For the comparisons, we used Cramer's V, which indicates how strongly two categorical variables are associated, with 1 indicating a strong association and 0 indicating no association. Values of 0.1, .03, and 0.5 are considered to be small, medium, and large effect sizes, respectively [34]. We also used Spearman's rank correlation coefficient between the variables. Coefficients were interpreted as limited (0.00 to 0.25), fair 0(.25 to 0.50), moderate (0.50 to 0.75) and excellent (0.75 to 1.0) [35].

SEM with ordinal data was conducted using the modified weighted least squares method (WLSMV). We examined the hypothesized model using all data obtained by the original questionnaire and then, modified the model. The model fit indices were comparative fit index (CFI), Tucker Lewis index (TLI), and root mean square error of approximation (RMSEA). For CFI and TLI, a value higher than 0.9 is the best model fit. For RMSEA, a value of 0.05 and smaller is a close fit, a value of 0.08 and smaller is a reasonable fit, and a value of 0.1 and higher is a poor fit [36]. The RMSEA value was supplemented with a 90% confidence interval (90% CI).

Results

Demographic characteristics of children

The average response rate was 85% (between 78.9% and 95.4% in school districts) (Supplemental material Table). In total, 6860 children completed the questionnaire. Among the collected data from 6860 children, 19 children were excluded due to missing data. As a result, data from 6841 children were analyzed. Among them, 2995 (43.78%) were boys, 3169 (46.32%) were girls, and 677 (9.9%) were children of uncategorized gender. Across the school district, no significant difference was observed in percentages between boys and girls (0.032 for Cramer's V, $p = 0.521$). Every student was either 10 or 11 years old.

Response characteristics

Table 1 shows the values for the valid sample number, interclass correlation, and p-value for each question item. Across the question items, the valid data rates were 95% and higher. No question item showed an ICC value of 0.05 or higher, indicating that all data could be described with individual-level variance.

Table 1
Values in valid sample, interclass correlation, and reliability for each question item (n = 6841)

Item wordings	Valid sample		ICC			Reliability
	n	%		95% CI Lower	95% CI Upper	
1. I am looking forward to going to my school	6531	95.5	.019	.008	.076	.939**
2. I play with friends a lot	6786	99.2	.009	.003	.039	.884**
3. I get along well with friends	6777	99.1	.003	.001	.015	.705*
4. Other kids like me	6744	98.6	.010	.003	.041	.888**
5. School teachers approve of my efforts	6757	98.8	.008	.003	.036	.873**
6. I am happy when talking to school teachers	6766	98.9	.011	.004	.048	.904**
7. I can prepare for classes by my own	6525	95.4	.009	.003	.038	.875**
8. I am proud of myself	6771	99.0	.008	.003	.034	.864**
9. I am helpful to others	6759	98.8	.008	.003	.034	.864**
10. I believe my efforts will be rewarded	6767	98.9	.003	.000	.014	.691*
11. My health status is	6615	96.7	.031	.012	.115	.962**
12. I get tired easily	6708	98.1	.006	.002	.026	.821**
13. I have anxieties/worries	6757	98.8	.021	.008	.083	.947**
Persons I talk to when sharing my experiences and thoughts with						
a. My mother	6763	98.9	.011	.004	.046	.900**
b. My father	6696	97.9	.007	.002	.029	.842**
c. My siblings	6670	97.5	.014	.005	.056	.917**
d. Other family members/relatives	6732	98.4	.019	.007	.075	.940**
e. School teachers	6933	98.4	.029	.012	.109	.960**
f. A school counselor	6655	97.3	.015	.006	.062	.927**
g. Instructors of extracurricular activities	6741	98.5	.004	.001	.020	.772**
h. My friends	6100	98.9	.014	.005	.057	.924**
ICC: interclass correlation; CI: confidence interval						
*$p < .01$, **$p < .001$						

Tables 2, 3, 4 and 5 show the responses and comparison of the responses between boys and girls according to the survey items. All question items indicated an ignorable level or no association in the comparison, indicating no difference in responses between boys and girls (all $p < 0.01$).

Table 2 shows the items of attending school and the positive relationships with friends and school teachers. For the item “I am looking forward to going to my school,” 45% of the children responded “agree,” followed by “strongly agree” (35%), “disagree” (14%) and “strongly disagree” (5%). Regarding the positive relationships with friends and school teachers, 70% of the children indicated “very much” for “playing with friends a lot,” and 80% of the children indicated “very much” for “getting along well with friends.” More than 85% of the children perceived that other children liked them (“very much” and “a little bit”), school teachers approved of their efforts (“very much” and “a little bit”), and they were happy when talking to school teachers (“very much” and “a little bit”).

Table 2
Comparisons of responses between boys and girls according to response alternatives in items 1–6

Items and response alternatives	Total		Boys	Girls	Cramer's
	n	%	%	%	*V*
1. Looking forward to going to my school					.106*
Strongly agree	2091	35.33	31.40	39.02	
Agree	2686	45.39	46.18	44.65	
Disagree	852	14.10	15.82	13.06	
Strongly disagree	289	4.88	6.60	3.27	
Subtotal	5918	100	100	100	
2. Playing with friends a lot					.053*
Very much	4269	69.78	72.23	67.47	
A little bit	1518	24.81	22.58	26.91	
Not at all	331	5.41	5.19	5.62	
Subtotal	6118	100	100	100	
3. Getting along well with friends					.008
Very much	5106	83.54	83.29	83.77	
A little bit	934	15.28	15.56	15.02	
Not at all	72	1.18	1.15	1.21	
Subtotal	6112	100	100	100	
4. Other kids like me					.069*
Very much	2218	36.47	36.04	36.87	
A little bit	2985	49.08	47.05	50.99	
Not at all	879	14.45	16.90	12.14	
Subtotal	6082	100	100	100	
5. School teachers approve of my efforts					.040
Very much	2216	36.36	35.48	37.20	
A little bit	3111	51.05	50.58	51.50	
Not at all	767	12.59	13.95	11.31	
Subtotal	6094	100	100	100	
6. Being happy when talking to school teachers					.089*
Very much	2716	44.52	40.02	48.74	
A little bit	2515	41.22	44.15	38.47	
Not at all	870	14.26	15.83	12.78	
Subtotal	6101	100	100	100	
*$p < .001$					

Table 3 shows the items of the positive perceptions of current circumstances and their subjective health. More than 80% of the children perceived that they were being able to prepare for classes independently ("very well" and "fairly"), were proud of themselves ("very well" and "a little bit"), and were helpful to others ("very well" and "a little bit"). More than 95% of the children believed their efforts would be rewarded ("very well" and "a little bit").

For the items on health status, 95% of the children perceived their subjective health status positively ("good" and "fair"). Only 20% of the children "did not get tired at all" while 80% of the children perceived becoming tired ("sometimes" and "frequently"). Only 30% of the children "had no anxiety/worry at all" while 70% of the children perceived having anxieties/worries ("a little bit" and "a lot").

Table 3
Comparisons of responses between boys and girls according to response alternatives in items 7–13

Items and response alternatives	Total		Boys	Girls	Cramer's
	n	%	%	%	*V*
7. Preparing for classes by own					.164*
Very well	1798	30.40	24.72	35.71	
Fairly	3398	57.48	58.50	56.52	
Poorly	631	10.67	14.83	6.78	
Not at all	86	1.45	1.96	0.98	
Subtotal	5912	100	100	100	
8. Being proud of oneself					.065*
Vary much	2208	36.18	39.41	33.15	
A little bit	3001	49.18	46.43	51.77	
Not at all	893	14.63	14.16	15.08	
Subtotal	6102	100	100	100	
9. Being helpful to others					.061*
Vary much	2026	33.27	32.37	34.11	
A little bit	3241	53.22	51.98	54.38	
Not at all	823	13.51	15.65	11.51	
Subtotal	6090	100	100	100	
10. Believing one's efforts will be rewarded					.045
Very much	4156	68.15	66.29	69.90	
A little bit	1726	28.30	29.54	27.14	
Not at all	216	3.54	4.16	2.96	
Subtotal	6098	100	100	100	
11. Subjective health status					.034
Good	4111	68.71	67.76	69.60	
Fair	1621	27.09	27.74	26.49	
Not very good	224	3.74	3.84	3.65	
Not good at all	27	0.45	0.66	0.26	
Subtotal	5983	100	100	100	
12. Not getting tired easily					.025
Not tired at all	1309	21.61	22.65	20.64	
Sometimes tired	2785	45.98	45.63	46.30	
Frequently tired	1963	32.41	31.72	33.06	
Subtotal	6057	100	100	100	
13. Not having anxieties/worries					.080*
No anxiety/worry at all	1670	27.43	30.79	24.28	
A little bit anxiety/worry	2793	45.88	45.10	46.61	
A lot of anxiety/worry	1625	26.69	24.11	29.12	
Subtotal	6088	100	100	100	
*$p < .001$					

Tables 4 and 5 shows the items of the persons the children talked to when sharing experiences and thoughts. More than 90% of the children indicated doing so with their mother (“frequently” and “sometimes”). More than 70% of the children indicated doing so with their father (“frequently” and “sometimes”). More than 60% of the children indicated doing so with siblings, other family members/relatives, and school teachers (“frequently” and “sometimes”). For school counselors, nearly 50 % of the children indicated “rarely” and more than 40% of the children indicated “no one such person”. For instructors of extracurricular activities, more than 40% of the children indicated “rarely.” More than 80% of the children indicated doing so with friends (“frequently” and “sometimes”).

Table 4
Comparisons of responses between boys and girls according to response alternatives in item 14 (mother, father, siblings, other family members/relatives, school teachers, and a school counselor)

Items and response alternatives	Total		Boys	Girls	Cramer's
	n	%	%	%	*V*
a. Mother					.101*
Frequently	4274	70.08	65.32	74.55	
Sometimes	1484	24.33	28.15	20.74	
Rarely	284	4.66	5.41	3.95	
No one such person	57	0.93	1.12	0.76	
Subtotal	6099	100	100	100	
b. Father					.069*
Frequently	2144	35.52	38.45	32.78	
Sometimes	2399	39.74	39.34	40.13	
Rarely	1104	18.29	16.26	20.19	
No one such person	389	6.44	5.96	6.90	
Subtotal	6036	100	100	100	
c. Siblings					.035
Frequently	2104	34.95	33.37	36.43	
Sometimes	1521	25.27	25.50	25.05	
Rarely	1603	26.63	27.80	25.53	
No one such person	792	13.16	13.33	12.99	
Subtotal	6020	100	100	100	
d. Other family members/relatives					.033
Frequently	1370	22.58	22.26	22.88	
Sometimes	2362	38.93	39.89	38.02	
Rarely	2069	34.10	32.98	35.12	
No one such person	267	4.40	4.87	3.96	
Subtotal	6068	100	100	100	
e. School teachers					.063*
Frequently	1139	18.75	20.77	16.85	
Sometimes	2611	42.99	43.06	42.92	
Rarely	2257	37.16	34.82	39.37	
No one such person	67	1.10	1.36	0.86	
Subtotal	6074	100	100	100	
f. A school counselor					.039
Frequently	72	1.20	1.51	0.91	
Sometimes	362	6.03	6.68	5.41	
Rarely	2937	48.90	48.22	49.55	
No one such person	2635	43.87	43.59	44.14	
Subtotal	6006	100	100	100	

*$p < .001$

Table 5
Comparisons of responses between boys and girls according to response alternatives in item 14 (instructors of extracurricular activities and friends)

Items and response alternatives	Total		Boys	Girls	Cramer's
	n	%	%	%	*V*
g. Instructors of extracurricular activities					.055*
Frequently	1104	18.16	20.03	16.41	
Sometimes	1404	23.10	23.69	22.53	
Rarely	2681	44.10	41.89	46.19	
No one such person	890	14.64	14.39	14.87	
Subtotal	6079	100	100	100	
h. Friends					.128*
Frequently	3622	59.38	54.93	63.57	
Sometimes	1675	27.46	27.64	27.29	
Rarely	746	12.23	16.08	8.60	
No one such person	57	.93	1.35	.54	
Subtotal	6100	100	100	100	
*$p < .001$					

Spearman's rank correlation coefficient between variables

The following variables showed significant and positive correlations with how children felt about attending school ("I am looking forward to going to school") at a fair level (all $p < 0.01$): "getting along well with friends" ($r = 0.303$), "other kids like me" ($r = 0.306$), "school teachers approve of my efforts" ($r = 0.339$), "being happy when talking to school teachers" ($r = 0.428$), "being able to prepare for classes by own" ($r = 0.254$), "being proud of oneself" ($r = 0.320$), "being helpful to others" ($r = 0.314$), "believing one's efforts will be rewarded" ($r = 0.306$), and subjective health status ($r = 0.273$). One significant and positive correlation at a moderate level was observed between "being proud of oneself" and "being helpful to others" ($r = 0.526$) (Table 6).

Table 6
Spearman's rank correlation coefficient between variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	a	b	c
1	1	.247**	.303**	.306**	.339**	.428**	.254**	.320**	.314**	.306**	.273**	.175**	.139**	.148**	.146**	.086**
2		1	.423**	.316**	.205**	.194**	.066**	.214**	.184**	.198**	.183**	.132**	.102**	.102**	.083**	.072**
3			1	.409**	.257**	.218**	.145**	.244**	.257**	.211**	.213**	.110**	.120**	.148**	.121**	.107**
4				1	.458**	.291**	.206**	.357**	.407**	.260**	.228**	.147**	.118**	.140**	.10**	.092**
5					1	.458**	.258**	.397**	.438**	.297**	.222**	.130**	.064**	.169**	.143**	.088**
6						1	.158**	.280**	.309**	.286**	.180**	.076**	.022	.157**	.147**	.078**
7							1	.201**	.249**	.176**	.179**	.106**	.091**	.112**	.057**	.060**
8								1	.526**	.414**	.255**	.107**	.112**	.152**	.172**	.117**
9									1	.363**	.247**	.109**	.058**	.189**	.166**	.134**
10										1	.224**	.074**	.043**	.187**	.164**	.084**
11											1	.195**	.161**	.159**	.123**	.101**
12												1	.265**	.029*	.054**	.017
13													1	.016	.055**	.038**
a														1	.399**	.301**
b															1	.341**
c																1
d																
e																
f																
g																
h																

*$p < 0.05$. **$p < 0.001$

1: Looking forward to going to my school; 2: Playing with friends a lot; 3: Getting along well with friends; 4: Other kids like me; 5: School teachers approve my teachers; 7: Preparing for classes by own; 8: Being proud of oneself; 9: Being helpful to others; 10: Believing one's efforts will be rewarded; 11: Subjective heal having anxieties/worries; a: mother; b: father; c: siblings; d: other family members/relatives; e: school teachers; f: school counselors; g: instructors of extracur when sharing experiences and thoughts

The initial model examination

Figure 2 shows the first examination using a SEM. The chi-square test of model fit was 4066.546 (degrees of freedom was 180, $p < 0.001$). Model fit indices were 0.056 for RMSEA (90% CI: 0.055, 0.058), 0.931 for CFI, and 0.919 for TLI. The first examination supported the hypothesized model. Positive relationships with friends and school teachers directly impacted how children felt about attending school (0.465 for the path coefficient value, $p < 0.001$). A positive perception of current circumstances (0.074 for the path coefficient value, $p = 0.014$) and positive subjective health (0.187 for the path coefficient value, $p < 0.001$) were positively and significantly associated with children expressing a positive view about attending school. The latent variable of having someone to share experiences and thoughts was not found to be related (0.009 for the path coefficient value, $p = 0.534$). The latent variable of the positive relationships with friends and school teachers was positively and significantly associated with a positive perception of current circumstances (0.789 for the path coefficient value), positive subjective health (0.519) and having someone to share experiences and thoughts (0.432) (all $p < 0.001$). A positive perception of current circumstances was positively and significantly associated with positive subjective health (0.519 for the path coefficient value) and having someone to share experiences and thoughts (0.411) (both $p < 0.001$). Positive subjective health was positively and significantly associated with having someone to share experiences and thoughts (0.260 for the path coefficient value, $p < 0.001$). For the latent variable of positive relationships with friends and school teachers, the path coefficient values for the variables were between 0.764 and 0.566 (all $p < 0.001$). For the latent variable of a positive perception of current circumstances, the path coefficient values for the variables were between 0.800 and 0.419 (all $p < 0.001$). For the latent variable of positive subjective health, the path coefficient values for the variables were between 0.826 and 0.340 (all $p < 0.001$). For the latent variable of having someone to share experiences and thoughts, the path coefficient values for variables were between 0.717 and 0.529 (all $p < 0.001$). A school counselor was an exception, showing a low path coefficient value (0.064, $p < 0.001$). We excluded the school counselor in the model modification.

Model modification

Figure 3 shows the modified model using SEM. Chi-square test of model fit was 3913.983 (degrees of freedom was 181, $p < 0.001$). Model fit indices were .0055 for RMSEA (90% CI: 0.053, 0.056), 0.933 for CFI, and 0.923 for TLI. Compared with the first examination, the values for the model fit indices slightly

improved, but the values obtained for the path coefficient were almost the same as the values in the first examination. The modified model was selected to describe the structural relation of how children felt about going to school.

Discussion

This study identified the structural relations among positive perceptions towards attending school for elementary school students in the 5th year in state-run schools in Saitama, Japan. The latent variable of positive relationships with friends and school teachers was positively and directly associated with children's feelings towards attending school. This study confirms the importance of positive relationships with friends and teachers. The relationships have previously been identified as key to overcoming school nonattendance [9–12, 24]. Positive health status and a positive perception of current circumstances were also related to how children felt about attending school, but not strongly. The latent variable of having someone to share experiences and thoughts did not impact the outcome of interest. The presence or absence of a school counselor was not found to be important.

Current guidance emphasizing the importance of understanding, acceptance and social support [4] seem to be reflected in the results obtained in this study. The items in the latent variable of positive relationship with friends and school teachers included "I get along well with friends," "other kids like me," and "school teachers approve of my efforts." In previous research, peer acceptance in school was associated with subjective health [37]. Support from school teachers and classmates has also been found to be significantly and positively related to "school satisfaction" [38] and emotional stability [39] among elementary school students.

The present study identified a moderate correlation between "school teachers approve of my efforts" and "I am happy when talking to school teachers." Moreover, sharing experiences with school teachers correlated with sharing experiences with mothers, fathers, siblings, and other family members or relatives. Feelings of being supported by adults have been identified as important for children with social, emotional and mental health-related difficulties to flourish in the school environment [40]. School teachers may be perceived as accessible adults who are available at schools. In fact, more than 60% of the children in this study indicated that school teachers were the people to whom the children talked when sharing experiences and thoughts, a frequency that was equivalent to siblings and other family members.

Teachers and the school environment have the potential to improve and intervene in students' mental health [41]. School counselors have previously been recommended. The presence or absence of school counselors, however, was not an important aspect in this study. The employment system of counselors, i.e., being employed directly by school district offices but not in schools may account for the result. For elementary school students, specialist counsellors were not as accessible as other staff, such as teachers. School teachers therefore have more potential to improve students' well-being and mental health in Japan. A range of interventions have been tested for mental health promotion in schools with varying degrees of success [42]. Evidence-based strategies to improve positive emotions and well-being may be useful in supporting children who have issues with attendance [43–46].

Strengths and limitations of the study

A large sample size, obtained by collaboration with the educational board in Saitama, Japan, enabled us to examine our hypothesized model. A high collection rate was supported by the school teachers who distributed and collected the original questionnaire.

However, this study has some limitations. First, our questionnaire was developed specifically for this study. There may be variables that were not included that account for some of the variance in the outcomes. Additionally, the generation of items was based on a rigorous development process; however, children were not included in development. Future studies may replace the current variables or add variables to improve the model fit indices. Methods including students may be used to improve the questionnaire. Second, we do not know whether students with a non-school attendance history were included in this study. Thus, we were unable to compare responses between students with poor versus good attendance.

Conclusions

This study examined children's perspectives on school attendance and related variables through a survey of 6841 elementary school students. This study found that positive relationships with friends and school teachers were significantly and positively associated with children looking forward to attending school. Positive health status and a positive perception of current circumstances were also significant, but the relationship was not as strong. This study reported a large-scale exploration of school nonattendance in Japan and presented a novel questionnaire and model.

Abbreviations

CFI: comparative fit index; ICC: intraclass correlation coefficient; RMSEA: root mean square error of approximation; SEM: a structural equation model; TLI: Tucker Lewis index; WLSMV: weighted least squares method.

Declarations

Acknowledgements

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Authors' contributions

HNT conceptualized the study and selected the methodology. HNT and NS selected the software, conducted the formal analysis, and engaged in validation, investigation, and curation of the data. HNT and NS implemented the original draft preparation. All authors contributed to reviewing and editing. All authors have read and agreed to the published version of the manuscript.

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Availability of data and materials

The data are stored at the Saitama Educational Board office and restricted for research use only before April 2022. The data are not publicly available. Please contact the corresponding author to discuss data access.

Ethics approval and consent to participate

This study was approved by the ethical standards of the Research Ethics Committee of Saitama Prefectural University (IBRA #19078). The children were provided with written and verbal explanations of the purpose and procedures of the study. Written explanations were provided to the children's parents or caregivers via the children. The children and their parents or caregivers who agreed to participate submitted the completed questionnaire.

Competing interests

The authors declare that they have no competing interests. There is no concern that any organizations could potentially influence or bias the insights of this study.

Consent for publication

Not applicable.

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Figures

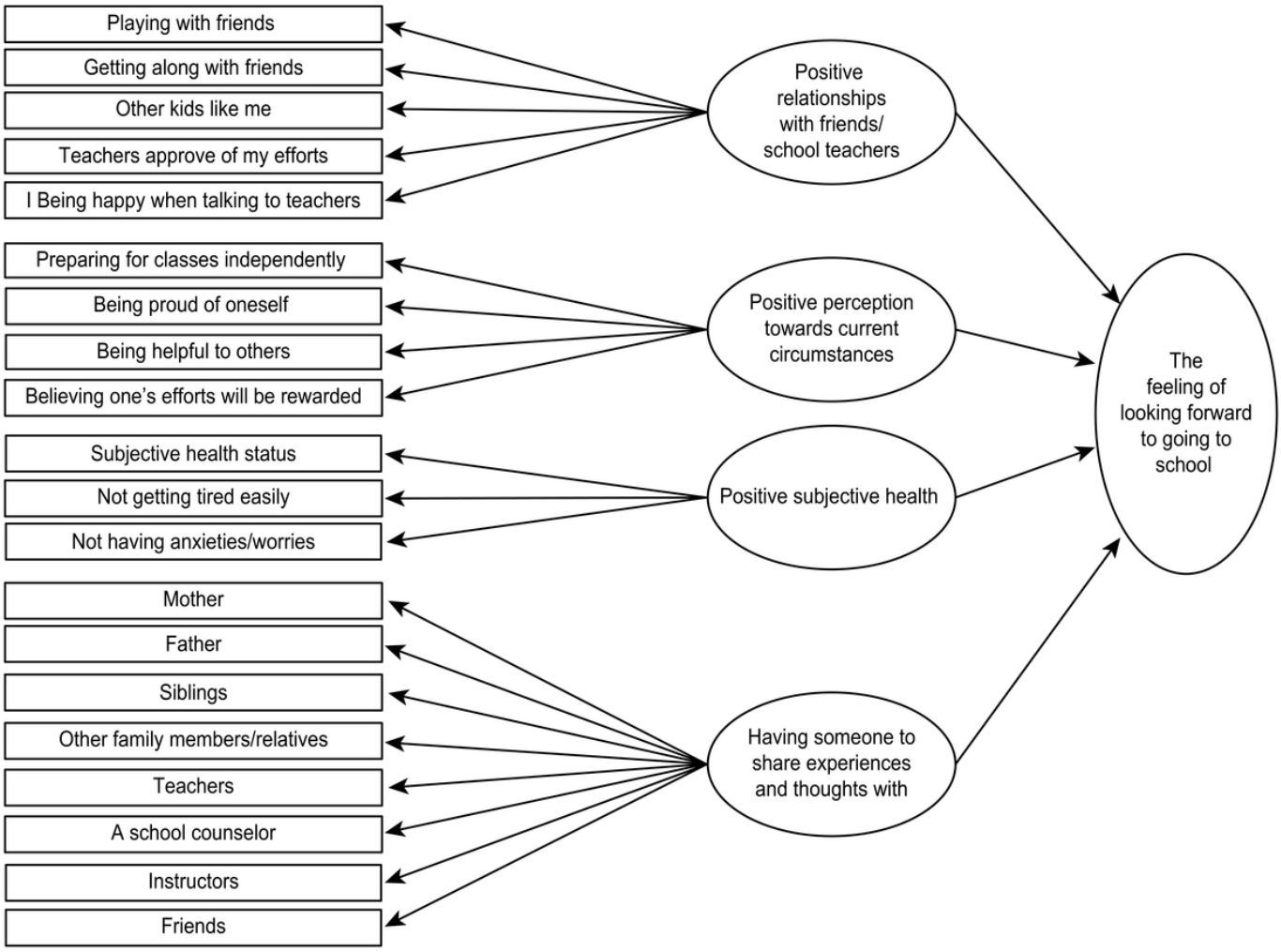

Figure 1

Hypnotized model

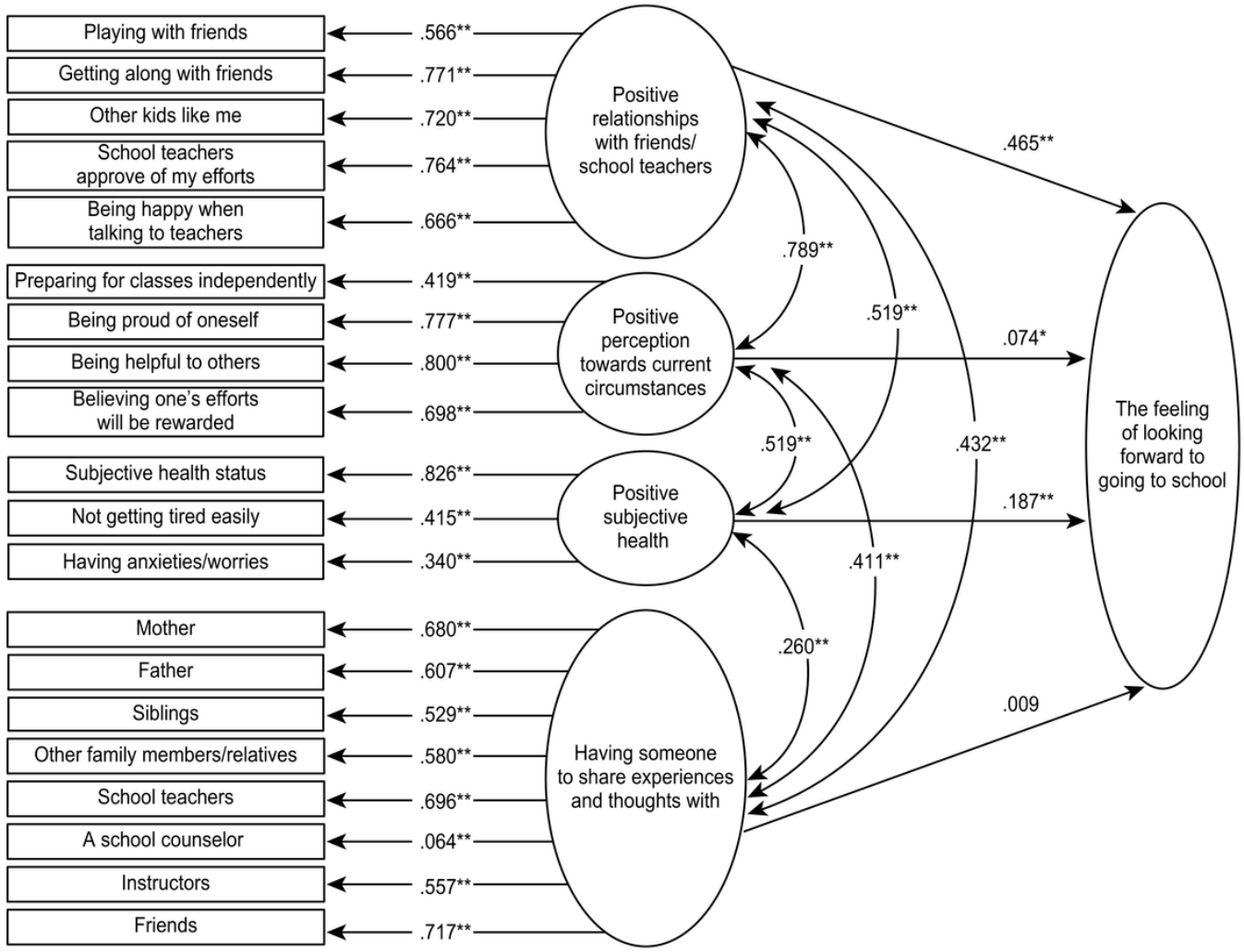

Figure 2

The first examination using a SEM Numbers are path coefficients, **p < 0.05, *p < 0.001

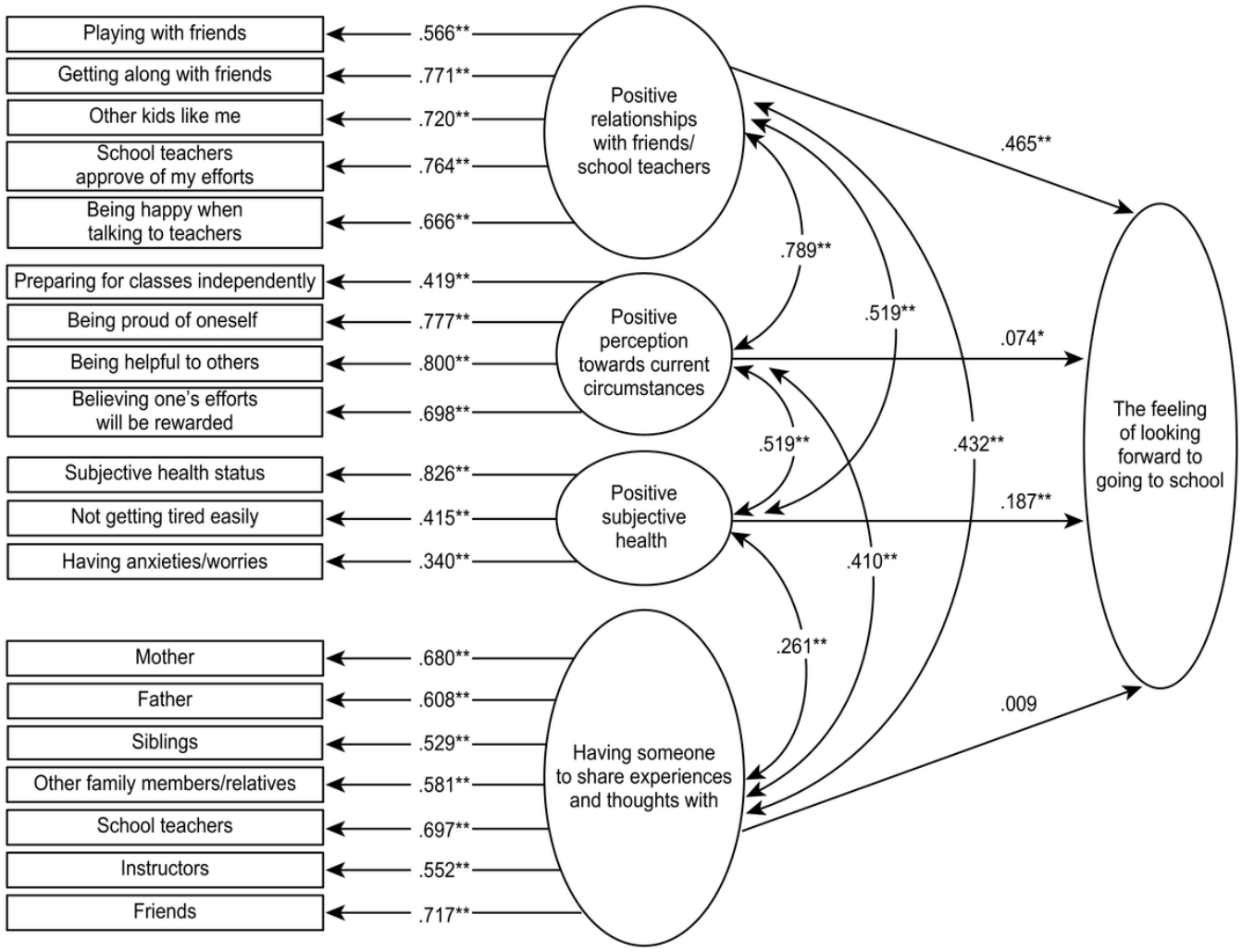

Figure 3

Modified model using SEM Numbers are path coefficients, *p < 0.05, **p < 0.001

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