

The Development of Japanese 13-item Version of Psychological Sense of School Membership Scale for Japanese Urban High School Students

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Objective: There are few studies about the indicators of the relationship between psychosocial school environment and student's self-concept in Japan. One of these indicators is the psychological sense of school membership scale (PSSM) in United States and European countries. The aim of this study was to develop a Japanese version of PSSM and examine its reliability and validity.

Methods: The participants of this study were 10th, 11th, and 12th grade male and female students at a private high school in the Tokyo metropolitan area (N = 1,539). This study used a 2-time-point longitudinal design, which was first applied in May 2007 (Time 1) and again in March 2008 (Time 2). The Central Location Test and the self-administered questionnaire method were used. The valid responses included 1,522 individuals (99.0%) at Time 1 and 1,378 individuals (90.4%) at Time 2.

Results: A three-factor 13-item-structure (named PSSM-13J) was adopted based on the results of reliability analysis and confirmatory factor analysis. Time 1 PSSM-13J and the difference in PSSM-13J related to Time 2 mental health status adjusted for Time 1 mental health status as originally expected in both genders. Moreover, the change in Time 1 PSSM-13J over 10 months predicted Time 2 psychosomatic symptoms in the male students. However, there was no relationship between PSSM-13J and Time 2 psychosomatic symptoms adjusted by Time 1 psychosomatic symptoms in the female students.

Conclusion: The Japanese version of the 13-item psychological sense of school membership scale had certain validity in addition to reliability.

Keywords: Psychological sense of school membership, sense of school belonging, high school student, factor analysis

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1. Introduction

The Japanese high school drop-out rate has shown a declining trend from 2.6% in 2001 to 2.0% in 2008. Before 2001, the most common reason for withdrawal was a change in career path; however, after 2002 the most common reason was psychosocial maladjustment to the school environment. The percentage of students with psychosocial maladjustment among all students who have dropped out of high school was 39.1% in 2008, representing a gradual increase over the previous 10 years. The absenteeism rate in Japanese junior high schools has been flat for 10 years after

having risen considerably in previous years. In Japan, there is still a need to develop countermeasures to solve the problem of school maladjustment.

On the other hand, several previous studies have focused on school maladjustment factors related to the school psychosocial environment such as social relationships (Demaray et al., 2005; Fallis & Opatow, 2003; Perry & Weinstein, 1998), student's disability (Fukunishi et al., 1993; Martínez & Semrud-Clikeman, 2004), family environment or relationships (Hamilton et al., 2009; Rousit et al., 2010; Serdeva et al., 1998) and so on.

However, most of the interventions used as

preventive measures of school maladjustment in Japan were secondary or tertiary prevention (Hieda & Suzuki, 2009). The examination of primary prevention of school maladjustment is fairly recent and undeveloped (Aruga et al., 2010). For example, a program that focuses on the skill of personal emotional control is the only one emphasizing a primary prevention measure (Otsui et al., 2007). Furthermore, in the research works on the psychological stressor and/or the perception of social support, these researches mentioned that taking psychological stressor and/or the perception of social support into account lead to the prevention of school maladjustment, occasionally (Furuya et al., 2007; Ishizu, 2006).

Moreover, there is hardly approach involving the evaluation and improvement of the school social environment from the point of view of school maladjustment. In particular, no evaluation measure of social environment itself as well as certain types of capacity leading to maintaining and improving the relationship between environment and the self-concept that cause school maladjustment has been developed sufficiently.

The psychological sense of school membership (PSSM) scale (Goodenow, 1993) is used in the United States in which the concept of the sense of belonging is central. PSSM represents a perceived evaluation of the capacity of the connection between psychosocial-school-environment and self-concept related to school maladjustment.

Goodenow (1993) developed the PSSM scale on the basis of the sense of belonging theory and school membership theory proposed by Wehlage. Wehlage (1989) defined school membership as a reciprocal social relationship among the students, the adults in the school, and the norms governing the institution. Wehlage (1989) indicated that one of the causes of students' school maladaptation, which was a serious problem in the United States in the 1980s, was a lack of the 'sense of belonging in school' or of 'psychological school membership.' Since then, this concept of the sense of belonging in a school community has gained prominence. It has been proposed that similar concepts such as belongingness, relatedness, acceptance, membership, and a sense of community in school are relevant to academic attitude and motivation, attitude toward self and others, participation, etc., in addition to emotional distress and psychological development (Osterman, 2000).

The PSSM scale was used in order to screen school absenteeism and school maladaptation (Goodenow, 1993). This scale comprises 18 items and a 5-point Likert scale. The scores of non-Hispanic students and city dwellers were significantly higher than those of Hispanic students and rural dwellers, and there were high correlations between the PSSM and the expectation of success in academic performance, the rate of school absenteeism and tardiness in junior high school and high school (Goodenow, 1993). In another study using an 18-item version, the relationships between PSSM and school performance, absenteeism, expectancy for success and academic motivation was revealed (Sánchez et al., 2005).

Moreover, the relationships between PSSM and academic competence (Kuperminc et al., 2008), academic self-efficacy and school satisfaction (McMahon et al., 2008), school adjustment (Pittman & Richmond, 2007), school climate factors (e.g., satisfaction with social relations in the school) (Cemalcilar, 2010), depression and self-efficacy (Kia-Keating & Ellis, 2007), and academic engagement (Singh et al., 2010) were also examined.

Hagborg (1994) revised the PSSM by deleting items 3, 6, and 12 (cf. Appendix) from the point of view of construct validity after conducting explanatory factor analysis (EFA). The factor structure was a three-factor model including "Belonging," "Rejection," and "Acceptance." The revised version of the PSSM had a high correlation with academic performance, satisfaction with school life, and good relationships between the student and the teachers. Moreover, after EFA was conducted, the PSSM was reduced to an 11-item scale (PSSM-Brief) from which items 3, 6, 9, 12, 13, 16, and 17 (cf. Appendix) were deleted on the basis of construct validity (Hagborg, 1998). The PSSM-Brief indicated a relationship among social skills, rule compliance, anxiety, and interest in school (Hagborg, 2000). Nichols (2006) examined the relationship between the PSSM2, a revised version of the PSSM, and students' sense of school belonging, which was evaluated by teachers. Faircloth & Hamm (2005) showed that school belonging, based on the PSSM, has a mediating effect on the impact of efficacy in academic performance. MacMahon & Washburn (2003) examined the evaluation of a violence prevention program based on the Second Step program. Therefore, the improvement of PSSM scale and examination of short version were significant for two points. First, internal consistency

and simplified determination of the measurement will be ensured. Next, construct validity of the scale will be improved including clarification of the subordinate concept structure. Especially, eliminating items which did not clarify a factor belongingness, factor validity of the scale is improved.

As mentioned above, PSSM has been examined repeatedly for the purpose of reforming the scale contents. Therefore, the original version of PSSM has room for improvement. In particular, we need to develop a short version through item analysis and the removal of items with low sensitivity, because the original version of PSSM has often been examined with the intent to foreshorten it since its development. Moreover, few studies on the sense of belonging, including school belonging, have been conducted in Japan (Togari et al., 2007). Besides, there is little agreement on the factor structure of the PSSM.

Therefore, the aim of this study was to develop a Japanese short version of the PSSM scale. In particular, our objectives were: (1) to conduct item analysis and Confirmatory Factor Analysis (CFA) to indicate the reliability of the scale and to clarify the factor structure and the stability of factors; (2) to examine the concurrent validity of the relationship between PSSM and related psychosocial factors observed in previous studies; and (3) to examine the predictive performance and causal relationship between the PSSM and psychosomatic symptoms/depressive tendency from the perspective of construct validity.

2. Methods

2.1. Participants

The participants of this study were 10th, 11th, and 12th grade male and female students from a private high school in the Tokyo metropolitan area ($N = 1,539$). This high school offers college preparatory and college level courses in combination with its parent university and has one of the most difficult entrance exams in the Tokyo metropolitan area. The number of early leavers of this high school was 6 (0.4%) in 2007. According to the Ministry of Education, Culture, Sports, Science and Technology, the early leavers' rate among all Japanese high school students was 2.0%.

Most Japanese high schools have a trimester system. The new school term in Japan starts in mid-

April, and the last trimester ends in March. This study used a 2-time-point longitudinal design, which was first used in May 2007 (Time 1) and again in March 2008 (Time 2). The Central Location Test and self-administered questionnaires methods were used.

The numbers and collection rates of the students were 1,537 (100.0%) at Time 1 and 1,445 (94.8%) at Time 2. These numbers exclude the number of students who temporarily withdrew from school. Moreover, after eliminating biased responses, the numbers of valid responses were 1,522 (99.0%) at Time 1 and 1,378 (90.4%) at Time 2. The frequency distributions of the participants by gender and grade are shown in **Table 2**.

The subjects of this study were students from whose those consent and their parental consent were obtained after they were informed about the study, their right to refuse, and that they would suffer no disadvantage even if they refused the participation. All forms and procedures were approved by the institutional review board.

2.2. Psychological Sense of School Membership Scale (PSSM) and Hypothesis of Factor Structure

Goodenow's PSSM scale (Goodenow, 1993) was used. In developing the Japanese version of the PSSM, first, we obtained the necessary permission from Dr. Goodenow. Secondly, English native speakers performed back translation and experts examined the face validity before the scale was actually used. In previous studies, Cronbach's Alpha coefficients were .77–.88 in the 18-item version (Goodenow, 1993), .87–.94 in the 15-item version (Hagborg, 1994), and .79–.94 in the 11-item version (PSSM-Brief) (Hagborg, 1998).

On the basis of the definition of the sense of belonging by Hagerty & Patusky (1992) and of school membership by Wehlage (1989), it may be presumed that the PSSM was divided into two major factors: "acceptance" and "belonging." In addition, "acceptance" can be further divided into two factors: "acceptance by students" and "acceptance by teachers." Hence, we developed a hypothetical second-order and three-factors model in light of Hagborg's studies of the factor analysis and shortening of the PSSM (Hagborg, 1994; 1998; 2000). That is to say, items 1, 2, 4, 8, 12, and 18 relate to "acceptance by students," items 5, 7, 9, 11, 14, and 15

relate to “acceptance by teachers”, and items 3, 6, 10, 13, 16, and 17 relate to “belonging” (cf. Appendix).

2.3. Indicators used to examine concurrent validity (Figure 1)

The indicators used to examine concurrent validity in this study were mental health inventory as a sense of coherence, perceived school performance and number of friends.

The sense of coherence concept includes the perception of his/her psychosocial environment (Antonovsky, 1987; Yamazaki, 2009). Therefore, a high correlative relationship between sense of coherence and PSSM was expected, or sense of coherence was used as a concurrent validity indicator, because PSSM also measured the student’s perception of the school psychosocial environment.

On the other hand, PSSM has a theoretical relationship with academic achievement (Goodenow, 1993) because the PSSM scale includes successful experience in school.

Previous studies have demonstrated the relationship between PSSM and academic outcomes (Hagborg, 1998; Sánchez et al., 2005), and PSSM has been found to be related to academic motivation (Sánchez et al., 2005) and academic efficacy (McMahon et al., 2008).

The relationship between social relationships in school and PSSM was examined by Cemalcilar (2010). She demonstrated that inter-student relationships directly related to PSSM. Therefore,

the number of friends, which functions as a social network indicator, was treated as one of the concurrent validity indicators.

2.3.1. Sense of coherence scale

The sense of coherence (SOC) refers to the sense of looking at or confronting one’s life and environments with the ability to cope with stressors. The 13-item SOC Scale (SOC-13) was used. The reliability and validity of this scale has been demonstrated (Eriksson & Lindström, 2005). Also, a Japanese version of this scale has been found to exhibit both reliability and validity (Togari et al. 2008). The total score was tallied using a 5-point semantic differential to serve as the SOC score.

2.3.2. Perceived school performance

Participants evaluated their school performance in ‘English,’ Mathematics’ and ‘Japanese Language’ by using a Likert scale ranked from ‘1 (bad)’ to ‘5 (excellent).’ The total score was used in this study. This indicator was used as a substitutional indicator of successful experience in school life (Feldt et al., 2005).

2.3.3. Number of friends

The question, ‘How many unfailing friends do you have?’ was asked. The numbers were logarithmically transformed. This indicator showed the size of the social support network of the students.

2.4. Indicators used to examine predictive validity (Figure 1)

The indicator used to examine predictive validity in this study was the mental health inventory in terms of depressive symptoms and psychosomatic symptoms. Since low school membership related to breakdown conditions such as school maladaptation, dropping out (Goodenow, 1993) and so on, there is a possibility that PSSM predicts depressive symptoms and psychosomatic conditions like stress reactions. Therefore, we evaluated psychosomatic conditions to examine the construct validity.

2.4.1. Mental Health Inventory (MHI-5)

The Mental Health Inventory is a subscale of the MOS 36-item Short-Form Survey (SF-36) (Ware & Sherbourne, 1992). Originally, this subscale consisted of 5 items related to depression and anxiety (Rumpf et

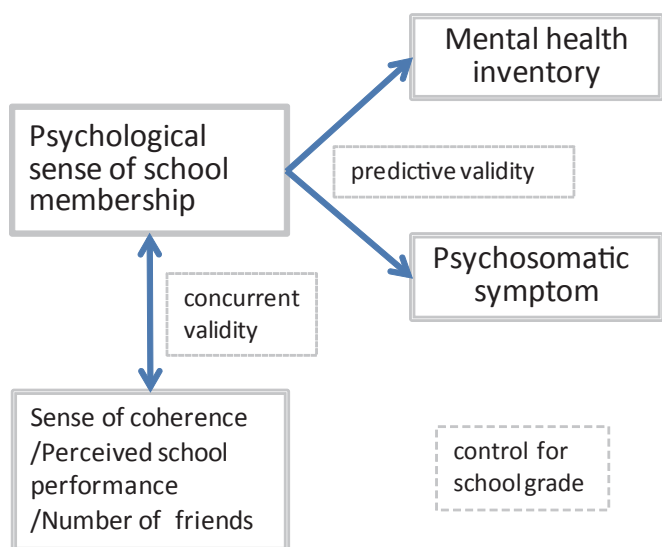


Figure 1 Hypothesis model for concurrent and predictive validity

al., 2001; Yamazaki et al., 2005). The reliability and criterion-related validity of this scale were verified for the Japanese population aged 16 or over (Yamazaki et al., 2005).

2.4.2. Psychosomatic symptoms

The psychological distress scale for school children and adolescents was used (Ben-sira, 1982). This scale is composed of 8 items including 'Did you have any trouble getting to sleep or staying asleep?' and 'Did you feel dizzy or light in the head?' and a 4-point Likert scale ranging from '1 often' to '4 never.'

2.5. Data analysis

Firstly, reliability analyses (Cronbach's alpha coefficients (alpha), item-total correlations and alpha if item deleted) were computed. Then, items were removed on the basis of the results.

Secondly, confirmatory factor analysis by structural equation modeling (SEM) was performed to examine factor validity.

Thirdly, partial correlation analysis controlled for the student's grade was performed to examine the relationships between PSSM and related factors including the sense of coherence, number of friends and perceived school performance, as the concurrent validity. Lastly, multiple regression analysis was performed to examine the predictive power of PSSM. The independent variables were Time 1 PSSM and the difference between Time 2 and Time 1 PSSM. The dependent variables were Time 2 mental health inventory and psychosomatic symptoms controlled for Time 1 values. We did not consider gender difference because there was no gender difference in PSSM and related factors in a previous study (Goodenow, 1993). However, we analyzed these models based on gender-stratified data, because physiological differences and subsequent social role differences arise in puberty.

The statistical packages SPSS16.0J for Windows and Amos 16.0 were used in the data analysis.

3. Results

3.1. Reliability Analyses

The coefficients of item-total correlations and alpha if item deleted for each item are shown in **Table 1**. Items 6, 10, 12, and 15 were eliminated because they demonstrated low item-total correlation, and from a

theoretical standpoint, these items are inconsequential with regard to the scale. Moreover, item 18 was eliminated as there is a possibility that this item was a double-barreled question. Consequently, this scale comprises 13 items; we thus administered the Japanese version of the PSSM as a 13-item scale (PSSM-13J). Cronbach's Alpha coefficients of this 13-item scale were .83 at Time 1 and .87 at Time 2.

3.2. Confirmatory Factor Analysis (CFA)

CFA was conducted for the hypothetical model. The stability factor structure assumed that the model had an equivalent constraint, i.e., the same factor loading or path coefficients between two points were model fit indices $\chi^2 = 1108.42$, $df = 289$, $\chi^2/df = 3.84$, CFI = .88, RMSEA = .06 in males (**Figure 2**), and model fit $\chi^2 = 800.96$, $df = 287$, $\chi^2/df = 2.79$, CFI = .94, RMSEA = .05 in females (**Figure 3**).

3.3. Score distribution and partial correlation analysis

The total 13-item scores based on the results of CFA by gender and grade are shown in **Table 2**. The mean score for males was 41.3 (SD=7.2), and that for females was 43.9 (SD=7.7). In each grade, the female score was higher than the male score ($p \leq .001$).

Table 1 Item-Total Analysis

	Time1		Time2	
	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Item1	.600	.820	.637	.857
Item2	.551	.822	.587	.859
Item3	.533	.823	.554	.860
Item4	.541	.823	.637	.858
Item5	.409	.829	.487	.863
Item6	.390	.830	.399	.866
Item7	.326	.835	.399	.868
Item8	.589	.820	.644	.857
Item9	.325	.832	.384	.867
Item10	.253	.843	.298	.875
Item11	.507	.825	.586	.860
Item12	.269	.835	.275	.871
Item13	.580	.819	.632	.857
Item14	.477	.826	.579	.860
Item15	.232	.837	.317	.869
Item16	.416	.829	.410	.867
Item17	.511	.823	.594	.858
Item18	.460	.827	.559	.861

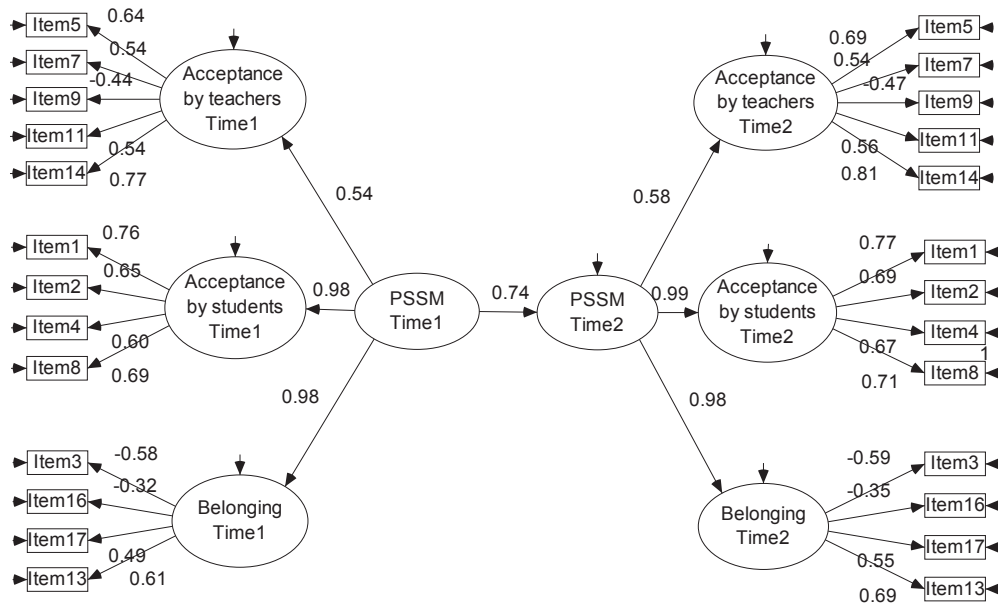


Figure 2 Confirmatory factor analysis: factor structure and factor loadings in male students

Note. Standardized coefficients were shown. All coefficients were significant ($p < .001$). Controlled for gender and grades. $\chi^2=1108.42$, $df=289$, $\chi^2/df=3.84$, $CFI=0.88$, $RMSEA=0.06$ Covariances between time corresponding errors (e.g. the error term of Time1 Item5 and that of Time2 Item5) were omitted. Factor loadings between time correspondings (e.g. the coefficient between Item3 and Belonging in Time1 and that in Time2) were equivalence constrained.

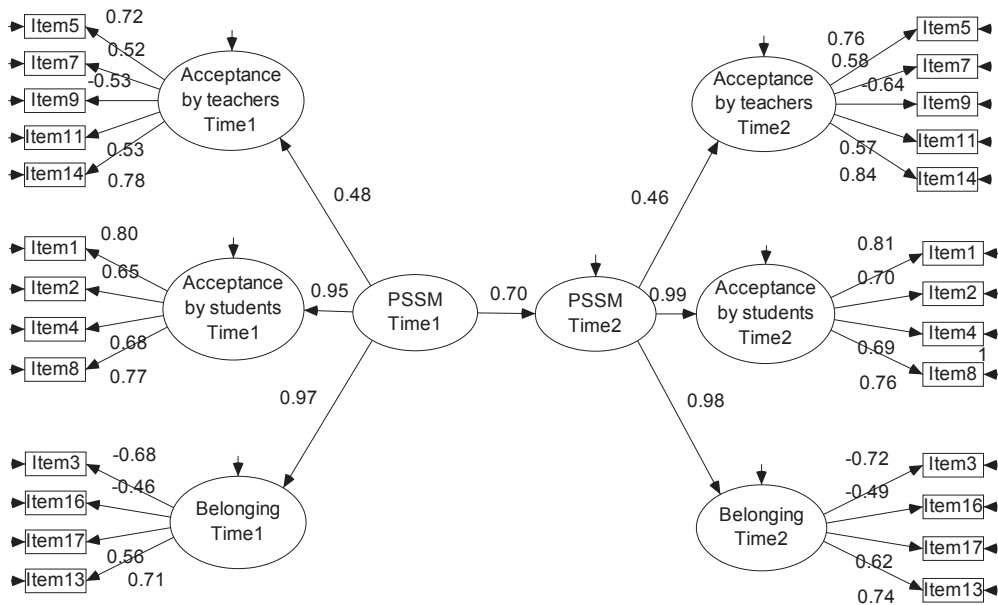


Figure 3 Confirmatory factor analysis: factor structure and factor loadings in female students

Note. Standardized coefficients were shown. All coefficients were significant ($p < .001$). Controlled for gender and grades. $\chi^2=800.96$, $df=287$, $\chi^2/df=2.79$, $CFI=0.94$, $RMSEA=0.05$ Covariances between time corresponding errors (e.g. the error term of Time1 Item5 and that of Time2 Item5) were omitted. Factor loadings between time correspondings (e.g. the coefficient between Item3 and Belonging in Time1 and that in Time2) were equivalence constrained.

Table 2 Descriptive statistics of 13-item version of Perceived Sense of School Membership scale (PSSM-13J)

	male			female			male vs female
	n	mean	(SD)	n	mean	(SD)	
Total	746	41.3	(7.2)	755	43.9	(7.7)	p<.001§
1st grade	278	42.4	(7.4)	234	44.7	(7.5)	p<.001¶
2nd grade	240	42.0	(6.7)	268	44.1	(7.2)	p=.001¶
3rd grade	228	39.2	(7.1)	253	42.8	(8.4)	p<.001¶

Note. *p<.05, ***p<.001 in bonferroni adjusted test. § F test ¶ Bonferroni adjusted post-hoc test was performed. Time1 PSSM score was shown.

Table 3 Partial correlations* between 13-item version of perceived sense of school membership and related variables

	male		female	
	coefficients	p-value	coefficients	p-value
Perceived school performance	.190	<.001	.113	.002
Number of friends**	.220	<.001	.271	<.001
Sense of coherence	.444	<.001	.455	<.001

Note. *Controlled for grade **Log transformation

The results of partial correlation analysis are shown in **Table 3**. There were significant relationships between PSSM-13J and perceived school performance, number of friends and sense of coherence in both genders.

3.4. Multiple regression analysis of the predictive effects of PSSM-13J

The results of multiple regression analysis of the effects of PSSM-13J on psychosomatic symptoms are shown in **Table 4**. In male students, Time 1 PSSM-13J and the difference in PSSM-13J were significantly related to Time 2 psychosomatic symptoms in model1. Moreover the relationships adjusted for Time 1 psychosomatic symptoms were significant in model2. In female students, PSSM-13J and the difference in PSSM-13J were related to Time 2 psychosomatic symptoms in model1. However, they were not related to Time 2 psychosomatic symptoms in model2.

The results of multiple regression analysis of the effects of PSSM-13J on mental health inventory are shown in **Table 5**. In both genders, Time 1 PSSM-13J and the difference in PSSM-13J were significantly related to Time 2 psychosomatic symptoms in model1. Moreover, the relationships adjusted for Time 1 psychosomatic symptoms were significant in model2.

4. Discussion

The aim of this study was to develop the Japanese short version of the PSSM scale and examine its reliability and validity. The results of reliability analysis suggested that the scale should include 13 items, and the results of the CFA indicated that the second-order three-factor model was valid and had a stability factor component of 10 months in both gender. Although in this research, we adopted 13-item version which was more contracted than the original 18-item version, construct validity of 13-item version was confirmed because three factor model based on the theory framework of Hagerty & Patusky (1992) and Wehlage (1989) was confirmed.

However, the path coefficients in CFA are not necessarily homology between both genders. Especially, the sizes of path coefficients to item 3, 9 and 16 in male students were rather smaller than female students. Hagborg (1994) who examined factor analysis did not analyze factor structure by gender, and not mention a difference of factor loading between both genders. There is a possibility that the gender difference of sensitivity to reverse items comes into play because items 3, 9 and 16 are reverse items. Detailed examination of this result is an issue for future research.

Moreover, the correlation between the scale and the related factors, namely the sense of coherence, academic performance and number of friends, and the effect of the scale on the mental health inventory

Table 4 Multiple regression analysis about predictive effect of 13-item version of perceived sense of school membership (PSSM-13J) on psychosomatic symptom

	male								female							
	model1				model2				model1				model2			
	B	(SE)	beta	p-value	B	(SE)	beta	p-value	B	(SE)	beta	p-value	B	(SE)	beta	p-value
Intercept	15.88	(1.24)		<.001	7.78	(1.21)		<.001	14.79	(1.13)		<.001	4.19	(.93)		<.001
Grade	.60	(.21)	.112	.004	.77	(.18)	.141	<.001	.19	(.20)	.036	.342	.69	(.15)	.127	<.001
Time1PSSM-13J	.15	(.03)	.233	<.001	.06	(.02)	.098	.010	.13	(.02)	.238	<.001	.03	(.02)	.047	.129
ΔPSSM13	.09	(.03)	.127	.002	.06	(.03)	.083	.023	.06	(.03)	.095	.020	.02	(.02)	.025	.409
Time1 Psychosomatic Symptom					.48	(.03)	.497	<.001					.67	(.03)	.698	<.001
R ²			.053				.282				.047				.493	
Adjusted R ²			.049				.272				.043				.490	

Note. Dependent variable is psychosomatic symptom. ΔPSSM is a value of Time2 PSSM minus Time1 PSSM.

Table 5 Multiple regression analysis about predictive effect of 13-item version of perceived sense of school membership (PSSM-13J) on mental health inventory

	male								female							
	model1				model2				model1				model2			
	B	(SE)	beta	p-value	B	(SE)	beta	p-value	B	(SE)	beta	p-value	B	(SE)	beta	p-value
Intercept	8.96	(.93)		<.001	4.99	(.90)		<.001	8.24	(.89)		<.001	4.78	(.84)		<.001
Grade	.50	(.16)	.116	.002	.58	(.15)	.137	<.001	.22	(.16)	.051	.156	.40	(.14)	.091	.005
Time1PSSM-13J	.17	(.02)	.357	<.001	.09	(.02)	.188	<.001	.18	(.02)	.386	<.001	.09	(.02)	.191	<.001
PSSM13	.14	(.02)	.244	<.001	.13	(.02)	.223	<.001	.14	(.02)	.245	<.001	.12	(.02)	.211	<.001
Time1 Mental Health Inventory					.42	(.04)	.431	<.001					.43	(.03)	.456	<.001
R ²			.122				.280				.132				.303	
Adjusted R ²			.117				.275				.128				.299	

Note. Dependent variable is psychosomatic symptom. ΔPSSM is a value of Time2 PSSM minus Time1 PSSM.

and psychosomatic symptoms were basically verified. In particular, Time 1 PSSM-13J and the difference in PSSM-13J related to Time 2 mental health status adjusted for Time 1 mental health status as originally expected. Therefore, the Japanese version of the 13-item PSSM scale, named PSSM-13J, had certain construct validity in addition to reliability (see also **Appendix**).

The PSSM-13J scores of 3rd grade students were lower than those of 1st and 2nd grade students. This result is the same as in previous research (Hagborg, 1998; 2000; Sánchez et al., 2005). Only the 'Belonging' subscale score was lower when students were examined according to three subscales, a result that was not shown. This result may be due to the fact that 3rd grade students were getting weary in this school because they had attended it for more than 5 years. However, detailed examination of this finding is an issue for future research.

The PSSM-13J scores of female students were higher than those of male students. Previous research also found the same result (Hagborg, 1998; 2000; Sánchez et al., 2005). However, this phenomenon was not discussed sufficiently in those works. Sánchez et al. (2005) explained that such a gender difference depended on the varying socialization process of girls versus boys. It has been mentioned that relatedness and connection with others are more important for

girls, whereas competition is more central for boys, according to developmental theory (Gilligan, 1982; Goodenow, 1993).

No examination of the relationship between psychosomatic symptoms and PSSM-13J was performed in previous studies. This relationship was examined by us for the first time. As a result, Time 1 PSSM-13J and the change in it over 10 months predicted Time 2 psychosomatic symptoms in the male students.

However, there was no relationship between PSSM-13J and Time 2 psychosomatic symptoms adjusted by Time 1 psychosomatic symptoms in the female students. In our hypothesis, gender differences were not considered. That is to say, we presupposed that there were no differences between genders. Meanwhile, in adolescent females, interpersonal factors are more likely than psychosocial school environment to be determinants of psychosomatic health issues related to the menstrual cycle. Therefore, future examination of the repeatability of our findings is needed using another sample.

The reliability and construct validity of the PSSM-13J were examined using these findings. However, there are several limitations.

First, the target group was limited. The participants of this study were the students of a private high school in the Tokyo Metropolitan area. The focus

of future research should be to replicate the current study with other regions and high schools taken into consideration; moreover, it will be necessary to examine the reproducibility of this result. Additionally, it will be necessary to conduct the study in junior high schools, as the original version of the PSSM-13J was adopted for junior high school students.

Second, there were only 2 time-points with a 10-month interval between them. The examination of more time-points with a wider interval will make it possible to examine the stability and predictive validity of the scale.

Finally, the indicators of criterion-related validity were limited. In school membership theory and school belonging theory, the PSSM-13J may predict drop-out, self-esteem, and academic performance. Therefore, it will be necessary to examine the relationship between the PSSM-13J and these indicators.

Moreover, the PSSM-13J scale can be an important primary outcome indicator of school-environment-building programs based on school membership theory and school belonging theory. In the future, these intervention programs will develop in congruence with the development of the PSSM-13J scale.

References

- Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay well*. San Francisco: Jossey-Bass Publishers.
- Aruga, M., Suzuki, E., & Tagaya, A. (2010). A literature review on school refusal and maladjustment (In Japanese). *Bulletin Nagano College of Nursing*, 12: 43-60.
- Ben-sira, Z. (1982). The scale of psychological distress (SPD): Cross-population invariance and validity. *Research Communications in Psychology, Psychiatry and Behavior*, 7: 329-346.
- Cemalcilar, Z. (2010). Schools as socialisation contexts: Understanding the impact of school climate factors on students' sense of school belonging. *Applied Psychology*, 59: 243-272.
- Demaray, M.K., Malecki, C.K., Davidson, L.M., et al. (2005). The relationship between social support and student adjustment: A longitudinal analysis. *Psychology in the Schools*, 42: 691-706.
- Eriksson, M., & Lindström, B. (2005). Validity of Antonovsky's sense of coherence scale: a systematic review. *Journal of Epidemiology & Community Health*, 59: 460-466.
- Faircloth, B.S., & Hamm JV. (2005). Sense of belonging among high school students representing 4 ethnic groups. *Journal of Youth and Adolescence*, 34: 293-309.
- Fallis, R.F., & Opotow, S. (2003). Are students failing school or are schools failing students? *Class cutting in high school*. *Journal of Social Issues*, 59: 103-119.
- Feldt, T., Kokko, K., Kinnunen, U., et al. (2005). The role of family background, school success, and career orientation in the development of sense of coherence. *European Psychologist*, 10: 298-308.
- Fukunishi, I., Honda, M., Kamiyama, Y., et al. (1993). Influence of mothers on school adjustment of continuous ambulatory peritoneal dialysis children. *Peritoneal Dialysis International*, 13: 232-235.
- Furuya, T., Sasaki, Y., Otoyama, W., et al. (2007). Psychological stress process of high school students : II. Psychosocial stressors (In Japanese). *Annual report of the Gunma University. Cultural science series*, 56: 279-298.
- Gilligan, C. (1982). *In a different voice: psychological theory and women's development*. Cambridge: Harvard University Press.
- Goodenow, C. (1993). The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools*, 30: 79-90.
- Hagborg, W.J. (1994). An exploration of school membership among middle and high-school students. *Journal of Psychoeducational Assessment*, 12: 312-323.
- Hagborg, W.J. (1998). An investigation of a brief measure of school membership. *Adolescence*, 33: 461-468.
- Hagborg, W.J. (2000). The child rating scale and its use with middle school-age students. *Psychological Reports*, 87: 381-388.
- Hagerty, B.M.K., & Patusky, K.L. (1992). Developing a measure of sense of belonging. *Nursing research*, 44: 9-13.
- Hamilton, H.A., Noh, S., & Adlaf, E.M. (2009). Perceived financial status, health, and maladjustment in adolescence. *Social Science & Medicine*, 68: 1527-1534.
- Hieda, S., & Suzuki, M. (2009). An attempt to prevent school maladjustment: The findings of the mental health survey of senior high school students (In Japanese). *Journal of Toho Gakuen*, 38: 57-68.
- Ishizu, K. (2006). Examining the factors which affect school morale among junior high school students (In Japanese). *Japanese Journal of School Psychology*, 6: 3-17.
- Kia-Keating, M., & Ellis, B.H. (2007). Belonging and connection to school in resettlement: Young refugees, school belonging, and psychosocial adjustment. *Clinical Child Psychology and Psychiatry*, 12: 29-43.
- Kuperminc, G.P., Darnell, A.J., & Alvarez-Jimenez, A. (2008). Parent involvement in the academic adjustment of Latino middle and high school youth: Teacher expectations and school belonging as mediators. *Journal of Adolescence*, 31: 469-483.
- Martínez, R.S., & Semrud-Clikeman, M. (2004). Emotional adjustment and school functioning of young adolescents with multiple versus single learning disabilities. *Journal of Learning Disabilities*, 37: 411-420.
- McMahon, S.D., & Washburn, J.J. (2003). Violence prevention: an evaluation of program effects with urban African American students. *The Journal of Primary Prevention*, 24: 43-62.
- McMahon, S.D., Parnes, A.L., Keys, C.B., et al. (2008). School belonging among low-income urban youth with disabilities: Testing a theoretical model. *Psychology in the Schools*, 45: 387-401.
- Nichols, S.L. (2006). Teachers' and students' beliefs about student belonging in one middle school. *The Elementary School Journal*, 106: 255-271.
- Osterman, K.F. (2000). Students' need for belonging in the

- school community. *Review of Educational Research*, 70: 323-367.
- Otsui, K., Otake, K., & Matsumi, T.J. (2007). Development of a three-level model for assessment of children's school adjustment (In Japanese). *The Japanese Journal of educational Psychology*, 55: 135-151.
- Perry, K.E., & Weinstein, R.S. (1998). The social context of early schooling and children's school adjustment. *Educational Psychologist*, 33: 177-194.
- Pittman, L.D., & Richmond, A. (2007). Academic and psychological functioning in late adolescence: The importance of school belonging. *Journal of Experimental Education*, 75: 270-290.
- Rousit, C., Campoy, E., Chaix, B., et al. (2010). Exploring mediating factors in the association between parental psychological distress and psychosocial maladjustment in adolescence. *European Child and Adolescent Psychiatry*, 19: 597-604.
- Rumpf, H., Meyer, C., Hapke, U., et al. (2001). Screening for mental health: validity of the MHI-5 using DSM-IV Axis I psychiatric disorders as gold standard. *Psychiatry Research*, 105: 243-253.
- Sánchez, B., Colón, Y., & Esparza, P. (2005). The role of sense of belonging and gender in the academic adjustment of Latino adolescents. *Journal of Youth and Adolescence*, 34: 619-628.
- Serdeva, S., Tzvetkov, D., & Manolova, A. (1998). Family and social determinants of school maladjustment in students with emotional disturbances and behavioral disorders from recovery schools in Bulgaria. *Central European Journal of Public Health*, 6: 280-283.
- Singh, K., Chang, M., & Dika, S. (2010). Ethnicity, self-concept, and school belonging: Effects on school engagement. *Educational Research for Policy and Practice*, 9: 159-175.
- Togari, T., Sakano, J., & Yamazaki, Y. (2007). Development of psychological sense of school membership scale Japanese version for elementary school upper grades. *Japanese Journal of School Health*, 49: 47-59.
- Togari, T., Yamazaki, Y., Nakayama, K., et al. (2008). Construct validity of Antonovsky's sense of coherence: Stability of factor structure and predictive validity with regard to the well-being of Japanese undergraduate students from two-year follow-up data. *The Japanese Journal of Health and Human Ecology*, 74, 2: 71-86.
- Ware, J.E., & Sherbourne, C.D. (1992). The MOS 36-item short-form health survey (SF-36): conceptual framework and item selection. *Medical care*, 30: 473-483.
- Wehlage, G.G. (1989). Dropping out: Can schools be expected to prevent it? In: Weis, L., Farrar, E., Petrie, H.G. (Eds) *Dropouts from school. Issues, dilemmas, and Solutions* (pp. 1-19). Albany: State University of New York Press. 1989:1-19.
- Yamazaki, Y. (2009). Concept and definition of sense of coherence as power for successful stress coping (In Japanese). *The Japanese Journal of Nursing Research*, 42: 479-490.
- Yamazaki, S., Fukuhara, S., & Green, J. (2005). Usefulness of five item and three-item mental health inventories to screen for depressive symptoms in the general population in Japan. *Health and Quality of Life Outcomes*, 3: 48.



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Main Works:

- Togari, T., Sato, M., Otemori, R. et al. Sense of coherence in mothers and children, family relationships and participation in decision-making at home: An analysis based on Japanese parent-child pair data. *Health Promotion International*, 26, (in press), 2011.

Membership in Learned Societies:

- Japanese Society of Public Health
- The Japan Sociological Society
- The Japanese Society of Health and Medical Sociology
- Japanese Society of Health Education and Promotion

Appendix Psychological Sense of School Membership Scale Japanese 13-item version (PSSM -13J)
(学校メンバーシップ感覚尺度日本語 13 項目版)

	OldNo.	contents
AS	Item 1	学校にとけこめている
AS	Item 2	学校の人たちは、自分が何か成功したときには、興味を持って注目してくると思う
B(rev)	Item 3	学校には自分の居場所がない
AS	Item 4	学校の生徒たちは私の考えを真剣に受け止めてくれる
AT	Item 5	学校の多くの教師は自分に興味を持っている
AT	Item 7	悩んでいるときに話を聞いてくれる教師が学校に 1 人はいる
AS	Item 8	学校にいる人たちに親しみを感じている
AT(rev)	Item 9	先生たちは自分には興味を持っていない
AT	Item 11	他の生徒と同じくらい大事に扱われている
B	Item 13	学校では、本来の自分であることができる
AT	Item 14	先生たちは自分のことを気にかけてくれている
B(rev)	Item 16	他の学校に通えたらいいのと思う
B	Item 17	この学校に入学したことを誇りに思う
	Item 6	時々自分はこの学校の生徒という実感がもてなくなる
	Item 10	学校での活動（クラブ・委員会・部活など）に熱心に取り組んでいる
除外項目	Item 12	この学校にいる生徒たちと自分は違っている
	Item 15	この学校にいる人たちは、自分がきちんと勉強できるということを知っている
	Item 18	自分が他の生徒たちに対して抱いているように、学校の他の生徒たちも自分に興味関心を抱いている

AS : Acceptance by students (生徒から受容されている感覚) AT : Acceptance by teachers (教師から受容されている感覚)

B : Belonging (所属感) rev: reverse item (逆点項目) Scale point: 5point; 1. I disagree (全く当てはまらない) through 5. I agree (よく当てはまる)