

Table 1
Details of grade and sex of participants of this survey.

Grade (age)	Male	Female	Total
1 (6–7)	490	403	893
2 (7–8)	450	428	878
3 (8–9)	478	441	919
4 (9–10)	419	392	811
5 (10–11)	421	431	852
6 (11–12)	417	361	778
7 (12–13)	416	374	790
8 (13–14)	387	377	764
9 (14–15)	364	365	729
Total	3842	3572	7414

2.2.3. Kyoken norm referenced test of academic performance

This is a standardized achievement test frequently used in Japan developed by Tatsuno, Ishida, Hattori, and Teachers at Tsukuba University's Elementary and Junior High Schools (2002). It evaluates children's performance on a scale of 100 points in each participant. Our survey employed the children's scores in Japanese and math. The test was conducted at the beginning of the school year.

2.2.4. Teacher ratings of needs for special care

For the first and second graders, we asked their classroom teachers to evaluate whether or not each student needs special care in a daily class.

2.3. Procedure

We prepared the questionnaire, containing the four types of scales above, and visited the schools covered to hand out the questionnaire to each teacher in early August, when the schools were in the middle of a summer off. The survey took almost a month to complete, till the end of the August. This survey was conducted in accordance with an agreement signed by and between the city of X and Hamamatsu University School of Medicine. For protection of personal data, we adhered to the city's information security policies. Thus, we paid due attention to the ethical issues related to the survey.

3. Results

3.1. Confirmatory factor analysis and reliability of ADHD-RS

We performed confirmatory factor analysis to examine the factor structure of Japanese version of ADHD-RS. Two models were compared: One presumed two factors, Inattentive and Hyperactive-Impulsive, following the prior studies (DuPaul, Power, Anastopoulos, et al., 1998; DuPaul, Power, McGoey, et al., 1998). The other model supposed only a single factor of ADHD. We found the fit indices of the two-factor model as GFI = .90, AGFI = .87 and RMSEA = .08, all sufficient values. Although the correlation between the factors was rather high at $r = .78$, it was consistent with the

Table 2
The result of confirmatory factor analysis of Japanese version of school form of the ADHD-RS and mean (SD) of items.

Item	F1	F2	M (SD)
Inattentive ($\alpha = .91$)			
Fails to give close attention to details or makes careless mistakes in schoolwork	.73		0.34 (0.70)
Has difficulty sustaining attention in tasks or play activities	.84		0.24 (0.65)
Does not seem to listen when spoken to directly	.58		0.13 (0.47)
Does not follow through on instructions and fails to finish work	.73		0.13 (0.48)
Has difficulty organizing tasks and activities	.71		0.20 (0.59)
Avoids tasks (e.g., schoolwork, homework) that require sustained mental effort	.75		0.22 (0.65)
Loses things necessary for tasks or activities	.72		0.18 (0.58)
Is easily distracted	.81		0.27 (0.69)
Is forgetful in daily activities	.68		0.18(0.56)
Hyperactive-Impulsive ($\alpha = .88$)			
Fidgets with hands or feet or squirms in seat		.70	0.22 (0.64)
Leaves seat in classroom or in other situations in which remaining seated is expected		.70	0.09 (0.41)
Runs about or climbs excessively in situations in which it is inappropriate		.66	0.04 (0.25)
Has difficulty playing or engaging in leisure activities quietly		.75	0.10 (0.41)
Is "on the go" or acts as if "driven by a motor"		.73	0.05 (0.32)
Talks excessively		.65	0.14 (0.51)
Blurts out answers before questions have been completed		.63	0.10 (0.43)
Has difficulty awaiting turn		.71	0.06 (0.33)
Interrupts or intrudes on others		.71	0.09 (0.41)

Note: Factor correlation is .78.

value of the prior studies. Next, the single-factor model had the fit indices of GFI = .77, AGFI = .70, and RMSEA = .11, indicating poor fitness of the model. We can decide, therefore, that the two-factor structure is more appropriate. Table 2 shows the factor analysis results with the two-factor model as well as the mean and SD of the items. With all of the items, we recognized some floor effect.

We obtained Cronbach's alphas for the two subscales of ADHD-RS and found them sufficient, .91 for Inattentive and .88 for Hyperactive-Impulsive. These values show sufficient reliability of the scales.

3.2. The sex and grade differences of ADHD-RS

We conducted sex × grade analyses of variance (ANOVA) with the two subscale scores and the total score of ADHD-RS as dependent variables (Table 3).

With Inattentive, the sex × grade interaction effect was significant ($F(8, 7396) = 3.93, p < .001$). We had a simple main effect test and found that the sex had significant simple main effects in all the grades. In every grade, the males scored higher than the females. Another simple main effect was found with the grades in the males. For the second graders and above, the older they were, the lower their scores were. Among the females, the simple main effects of grade were nonsignificant.

With Hyperactive-Impulsive, the sex × grade interaction effect was significant ($F(8, 7396) = 8.87, p < .001$). Simple main effects of the sex were significant on the second through seventh graders, with the males scoring higher than the females

Table 3
Two-factor analyses of variance (ANOVA) of scale scores of ADHD-RS by sex and grade with Bonferroni multiple comparison ($p < .05$).

Grade (Age)	Male	Female	Sex × grade		Sex	Grade
	M (SD)	M (SD)	F		F	F
Inattentive						
1 (6–7)	2.26 (4.57)	0.83 (2.42)	3.93***		378.69***	8.22***
2 (7–8)	3.78 (5.67)	1.17 (2.97)	28.13***		M > F	2 > 1, 5, 6, 8, 9
3 (8–9)	3.49 (5.97)	1.10 (2.69)	92.81***	M > F		3 > 1, 5, 6, 9
4 (9–10)	3.30 (5.46)	0.98 (2.53)	81.26***	M > F		4 > 5, 9
5 (10–11)	2.27 (4.60)	0.67 (2.31)	67.55***	M > F		7 > 9
6 (11–12)	2.77 (5.27)	0.56 (1.87)	34.03***	M > F		
7 (12–13)	2.61 (4.62)	1.36 (3.34)	58.36***	M > F		
8 (13–14)	2.42 (4.35)	0.99 (2.80)	19.01***	M > F		
9 (14–15)	1.90 (3.54)	0.74 (2.03)	24.37***	M > F		
			15.03***	M > F		
			M: 10.80***	2 > 1, 5, 6, 7, 8, 9		
				3 > 1, 5, 7, 8, 9		
				4 > 1, 5, 9		
			F: 1.58			
			8.87***		367.54***	9.02***
Hyperactive-Impulsive						
1 (6–7)	1.36 (3.34)	0.35 (1.37)	32.55***	M > F	M > F	1 > 9
2 (7–8)	2.18 (4.21)	0.32 (1.25)	108.68***	M > F		2, 3 > 6, 7, 8, 9
3 (8–9)	2.12 (4.68)	0.23 (1.01)	117.71***	M > F		4, 5 > 9
4 (9–10)	1.74 (3.87)	0.23 (1.22)	66.36***	M > F		
5 (10–11)	1.57 (3.69)	0.14 (0.78)	62.24***	M > F		
6 (11–12)	1.29 (3.12)	0.13 (0.70)	37.81***	M > F		
7 (12–13)	1.24 (3.02)	0.29 (1.04)	25.54***	M > F		
8 (13–14)	0.87 (2.42)	0.39 (1.47)	6.39*	M > F		
9 (14–15)	0.50 (1.62)	0.18 (0.63)	2.69			
			M: 17.72***	1 > 9		
				2 > 1, 5, 6, 7, 8, 9		
				3 > 1, 6, 7, 8, 9		
				4, 5 > 8, 9		
				6, 7 > 9		
			F: 0.48			
			6.15***		440.29***	9.28***
ADHD-RS total						
1 (6–7)	3.62 (7.31)	1.18 (3.51)	35.11***	M > F	M > F	2 > 1, 5, 6, 7, 8, 9
2 (7–8)	5.96 (9.26)	1.50 (3.89)	116.40***	M > F		3 > 1, 5, 6, 8, 9
3 (8–9)	5.61 (10.12)	1.33 (3.42)	111.62***	M > F		4, 7 > 9
4 (9–10)	5.04 (8.71)	1.21 (3.31)	78.91***	M > F		
5 (10–11)	3.84 (7.68)	0.81 (2.79)	51.98***	M > F		
6 (11–12)	4.06 (7.70)	0.69 (2.40)	58.47***	M > F		
7 (12–13)	3.84 (6.94)	1.65 (4.07)	25.27***	M > F		
8 (13–14)	3.30 (6.19)	1.38 (3.91)	18.67***	M > F		
9 (14–15)	2.40 (4.63)	0.92 (2.47)	10.53**	M > F		
			M: 14.68***	2, 3 > 1, 5, 6, 7, 8, 9		
				4 > 1, 8, 9		
				5, 6, 7 > 9		
			F: 1.06			

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 4
Descriptive statistics of school form of the ADHD-RS.

Age (grade in Japan)	This study				DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998)				Comparison between country	
	Male		Female		Male		Female		Male	Female
	N	M (SD)	N	M (SD)	N	M (SD)	N	M (SD)	t	t
Inattentive										
5–7	–	–	–	–	243	8.75 (7.66)	211	6.59 (7.26)	–	–
8–10 (2–4)	1347	3.53 (5.71)	1261	1.09 (2.74)	307	10.33 (8.49)	258	6.04 (7.29)	13.34**	10.74**
11–13 (5–7)	1254	2.55 (4.84)	1166	0.86 (2.60)	221	9.33 (8.11)	222	5.97 (6.76)	12.03**	11.09**
14–18	–	–	–	–	223	8.25 (7.27)	223	4.09 (5.26)	–	–
Hyperactive-Impulsive										
5–7	–	–	–	–	243	8.12 (7.86)	211	5.66 (7.27)	–	–
8–10 (2–4)	1347	2.02 (4.29)	1261	0.26 (1.16)	307	8.43 (8.05)	258	3.81 (6.15)	13.50**	9.21**
11–13 (5–7)	1254	1.37 (3.29)	1166	0.19 (0.85)	221	5.96 (6.72)	222	3.62 (5.61)	9.93**	9.08**
14–18	–	–	–	–	223	4.37 (6.09)	223	1.97 (3.40)	–	–
ADHD total										
5–7	–	–	–	–	243	16.87 (14.61)	211	12.25 (13.61)	–	–
8–10 (2–4)	1347	5.55 (9.41)	1261	1.35 (3.55)	307	18.76 (15.51)	258	9.86 (12.63)	14.31**	10.71**
11–13 (5–7)	1254	3.91 (7.44)	1166	1.04 (3.18)	221	15.28 (13.55)	222	9.59 (11.42)	12.13**	11.05**
14–18	–	–	–	–	223	12.62 (12.16)	223	6.06 (7.94)	–	–

** $p < .01$.

across all those grades. Again, with the males, the grade had a significant simple main effect, with the higher-grade males scoring lower. The simple main effects of grade were nonsignificant among the females.

With the total score of ADHD-RS, the sex \times grade interaction effect was significant ($F(8, 7396) = 6.15, p < .001$). A simple main effects of sex were significant with all the grades, with the males scoring higher than the females. In addition, among the males the grade has a significant simple main effect, with the score tending to decline as the grade went up. The grade had no significant effect among the females.

3.3. Comparison between Japanese data and USA data of ADHD-RS

We compared the Japanese ADHD-RS scores obtained in our survey to those of the US collected by DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998). The scores are presented in Table 4. Note that we compared only two age groups, 8–10 years of age and 11–13 years of age, since our participants were limited in age. Also, it is a very common that children are grouped not by their physical age but by their school grades when examining the developmental differences in Japan. For this reason, our survey grouped the participants according to their school grades to match the age classifications of DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998) for this comparison. This comparison showed that the Japanese children scored lower than did their US equivalents in the two subscale scores and the total score.

3.4. Correlations of ADHD-RS-IV with study variables

Table 5 shows the correlations between ADHD-RS and the study variables. The correlations with IQ were nearly zero, while the standardized achievement test scores showed significant negative correlations in all cases. Totally, Inattentive showed relatively high correlation.

3.5. Comparison between students with and without needs for special care

We compared the ADHD-RS scores between children with needs for special care and those without the needs (Table 6). Students who need special care scored significantly higher in two subscale scores and total score. This suggests that intensity

Table 5
Correlations of ADHD-RS with study variables.

	Inattentive	Hyperactive-Impulsive	ADHD total
IQ (N = 6115)	-.03*	.01	-.01
Standardized achievement test			
Japanese (N = 6376)	-.29***	-.13***	-.25***
Math (N = 6376)	-.30***	-.12***	-.25***

* $p < .05$.

*** $p < .001$.

Table 6

The comparison between students who need special care and who do not need special care in ADHD-RS scores.

	Children without needs for special care	Children with needs for special care	<i>t</i>
	<i>M (SD)</i>	<i>M (SD)</i>	
Inattentive	1.37 (3.21)	9.60 (6.95)	−14.27***
Hyperactive-Impulsive	0.66 (2.03)	5.79 (6.16)	−10.08***
ADHD total	2.03 (4.84)	15.39 (11.68)	−13.81***

*** $p < .001$.

of the ADHD tendency was a factor considered by the teachers as they decided whether or not a child was in need of such special care.

4. Discussion

4.1. Factor structure, reliability, and validity of ADHD-RS in Japan

We examined the factor structure of ADHD-RS using a confirmatory factor analysis and found that a two-factor structure of Inattentive and Hyperactive-Impulsive fit the data, consistent with prior studies (DuPaul, Power, Anastopoulos, et al., 1998; DuPaul, Power, McGoey, et al., 1998). With the reliability of the scale, we obtained sufficient alpha coefficients, indicating good reliability. Future studies should examine the reliability with the test-retest method.

4.2. The relationships between ADHD-RS and IQ and academic performance

We examined correlations between the ADHD-RS scores and the children's IQ and their standardized achievement tests scores of Japanese and math. The ADHD-RS scores showed no relationships with IQ. There are several hypotheses concerning complications of ADHD and mental retardation indicated by IQ. Our survey result agrees with another research reporting no significant difference in IQ between an ADHD group and a normal one (Kaplan, Crawford, Dewey, & Fisher, 2000). Some other researches indicate that while ADHD children with learning disorders are lower in IQ than normal children, ADHD children without learning disorders are no inferior in IQ (August & Garfinkel, 1989; Dykman & Ackerman, 1991). Future studies should examine the case of complications of learning disorders and ADHD in Japan. Meanwhile, we observed significant negative correlations between the ADHD-RS scores and the standardized achievement test scores. The correlation was especially high with inattentive. This finding agrees with the common understanding that many ADHD children also have chronic, poor academic performance inadequate to their intelligence (McConaughy, Achenbach, & Gent, 1988), which is a major problem with the disorder (Barkley, 1998). There are some hypotheses about the links between ADHD and poor academic performance. DuPaul and Stoner (2003), following Silver's (1990) hypothesis, pointed out that while ADHD children have no problem with their intelligence itself, they lose their opportunities of learning since they lose their attention and concentration easily, which results in their poor performance. McGee and Share (1988) argued that some disorders with academic skills eventually result in behavioral problems such as inattention and impulsiveness. Our survey finding supported the links between poor academic performance and ADHD tendencies, especially inattention.

4.3. Sex and grade differences of ADHD-RS scores in Japan

Our analyses of variance yield some significant sex \times grade interaction effects for two subscale scores and total scores of ADHD-RS. Among the males, we saw a simple main effect of the grade. For the second graders and older, the higher the grade was, the lower were the scores. This means males of the second grade or above, as they grew older, they became more able to control their behaviors and impulse and maintain their attention. This agrees with a report that the symptoms of ADHD reach their peak in childhood, diminish in degrees during later childhood, and the symptoms disappear during the period in 50% of the children who satisfied the criteria of ADHD (Campbell, 2002). As for the remaining 50% in whom some problems remain after they enter elementary school, 59–67% of them can continue with their destructive behavioral disorder into the later childhood or even early adolescence (Raggio & Pierce, 1999). Thus, we cannot disregard the importance of identifying ADHD children among third or fourth graders or older.

In our survey, the first graders scored lower than did the second graders. We ascribe this to two factors. First, the teachers of the first graders evaluated their children on criteria slacker than those used by the teachers of the other grades. First grade is a transitional period from the preschool years into school years. Then, at least in Japan, many first graders tend to feel nervous since they have yet to get accustomed to life in school, which quite different from what they experienced in their preschool years. Thus, we can expect teachers of first graders to evaluate their children on a slacker standard. The other factor is a possibility that the first graders covered by our survey, as a whole, were of a generation with less ADHD tendency. This issue requires more researches, taking into consideration evaluations by their parents or third parties.

We found the significant main effects of sex, with the males showing stronger ADHD tendency than did the females. This is consistent with DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998). Also, the grade had no

significant simple main effect among the females. It is because the females, across all the grades, scored quite low. These results are in agreement with international epidemiological reports, which also suggest that the Japanese version of school form of the ADHD-RS has constructive validity.

4.4. Difference between Japanese data and USA data of ADHD-RS scores

We compared the scores between the US and Japan and found that the Japanese children scored lower than did their US children on the subscale scores and total score of ADHD-RS, irrespective of sex and age group. This result suggests that the Japanese children have less ADHD tendency than did the children in the US. However, we have another interpretation of the result. Many of the Japanese teachers might be less strict with their children than are many US teachers. One cross-cultural difference in child rearing and classrooms between the West and Japan is that between individualism and collectivism (Triandis, 1995). In the US, where the culture tends to nurture individuality and uniqueness, we can expect many classroom teachers to be generally sensitive to individuality of each pupil. Thus, many US teachers can recognize individual differences of their pupils, in a test such as ADHD-RS, in which a teacher evaluates each child. On the contrary, in the Japanese culture, which prioritizes collective standards above individuality, many teachers can evaluate individual children in terms of deviation from the group's norm. Therefore, many teachers may tend to focus on those children who stand out in their evaluation, leaving many other children unaccounted for. In the US, more teachers consider each and every child, we can expect. We recognized some floor effect with all of the items (Table 2). Also, we asked the teachers to separate those children in need of special care and those who had no such need. We compared the scores the teachers gave for those two types of children and found that the scores given to children with needs for special care were drastically higher than those given to the children without needs for special care (Table 6). These findings reflect the point of view many Japanese teachers have of their children.

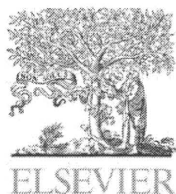
4.5. Limitation and perspectives

Employing Japanese version of school form of the ADHD-RS, our survey compared the scores between the US and Japan and examined correlations with several variables. It showed that ADHD-RS has sufficient reliability and validity, and provides a basic data of ADHD in Japanese children. With respect to reliability, however, we further need to examine agreement rates with evaluations by people other than teachers and test–retest reliability. Also, some parts of our results did not agree with some prior studies and what we know from our experiences. For instance, the first graders scored lower than did any other graders. We think this is ascribable to the evaluation criteria. As this example suggests, we need further consideration and examinations in measurements used for collective screening of children with ADHD in Japan. Attempts for improvement include, among others, having more items that are hard to evaluate relatively, adjusting the number of alternatives, and having less items to reduce the teachers' work. At the same time, however, each school has a considerably different culture and we suppose many things should be ascribed to different viewpoints held by different school cultures. In addition, though we consider that this survey's epidemiological significance lies in that it was a complete survey in the target city, not a sample survey, we still need compare the results to those of surveys conducted in other cities, for the sake of further generalization of the findings. In addition, although this survey included only elementary and lower-secondary schools, a future survey including a broader range of schools might reveal some more developmental differences. Thus, further surveys and analyses are necessary in the future.

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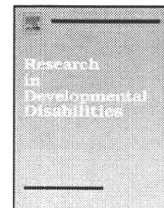
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Japanese version of home form of the ADHD-RS: An evaluation of its reliability and validity

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ABSTRACT

Using the Japanese version of home form of the ADHD-RS, this survey attempted to compare the scores between the US and Japan and examined the correlates of ADHD-RS. We collected responses from parents or rearers of 5977 children (3119 males and 2858 females) in nursery, elementary, and lower-secondary schools. A confirmed factor analysis of ADHD-RS confirmed the two-factor solution (Inattentive and Hyperactive-Impulsive) same as previous studies. ADHD-RS scores were not related to IQ, but were negatively associated with standardized achievement test scores. Males showed stronger ADHD tendencies than did the females, and the scores ended to decline as the children grew older. Japanese children scored lower than did their US children in Hyperactive-Impulsive among all of the sex-age groups. Japanese version of home form of the ADHD-RS was developed with good reliability and validity. More researches of ADHD in Japanese children are required.

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1. Introduction

The Developmental Disabilities Support Act, which was enforced in 2005, marked the start of individual supports to children with developmental disabilities in the Japanese educational system. Prior to it, in 2002, a research team of the Ministry of Education, Culture, Sports, Science and Technology conducted a survey of 41,579 school children in five regions of Japan. This survey, named “a nationwide survey of children and students going to regular classes in need of individual educational support,” interviewed classroom teachers about the following: students’ learning, which covered learning disorders; students’ interpersonal relationships, which covered pervasive developmental disorders; and behavior and attention, which covered ADHD. As a result, the survey found out that 6.3% of the children and students surveyed had some developmental disorders and were in need of educational help (The Ministry of Education, Culture, Sports, Science and Technology, 2003). This finding proved to be very persuasive and accelerated the shift of the emphasis in the Japanese educational system for the children with developmental disabilities towards education with special support education. The survey also found that 2.5% of the children surveyed showed obvious characteristics of ADHD, although this figure was smaller than that of the US. At that time, the concept of developmental disorders was yet to spread enough in Japan, thus this figure was surprising one.

Currently, Attention Deficit-Hyperactivity Disorder (ADHD) is defined as follows: (a) some signs of inattention or hyperactivity-impulsivity have been present for at least 6 months to a point that is disruptive and inappropriate for

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developmental level; (b) some signs that cause impairment were present before age 7 years; (c) some impairment form the signs is present in two or more settings; (d) there must be clear evidence of significant impairment in social, school, or work functioning; (e) the signs do not happen only during the course of a pervasive developmental disorder, schizophrenia, or other psychiatric disorder (American Psychiatric Association, 1994). In particular, the evaluation of children's behaviors with ADHD at school has come to be more important, especially after early childhood. After entering the elementary school, more children become to express maladaptive behaviors in their classroom, and educational supports for the behaviors are required. In addition, children with ADHD often have some academic problems. They tend to show problems of continuing poor academic performance inadequate to their intelligence compared to other mental disorders (McConaughy, Achenbach, & Gent, 1988). This is a major problem with the ADHD (Barkley, 1998).

In another study, we paid attention to school settings where ADHD syndromes tend to emerge and attempted to standardize the Japanese version of home form of the ADHD-Rating Scale-IV (ADHD-RS: DuPaul, Power, Anastopoulos, & Reid, 1998). The effectiveness of ADHD-RS as a tool of initial screening was confirmed (DuPaul, Power, McGoey, Ikeda, & Anastopoulos, 1998).

There are some hypotheses about the links between ADHD and poor academic performance. Silver (1990) pointed out that while ADHD children have no problem with their intelligence itself, they lose their opportunities of learning because of the major ADHD behaviors (inattention, impulsiveness, and hyperactivity) they have, which results in their poor performance. On the other hand, McGee and Share (1988) claimed that children with ADHD have some academic skill problems and their lowered academic self-concept causes the behavior problems such as inattention and impulsiveness. Because there are different groups of children with ADHD and learning disorders, it is possible that different causes related to the problematic behaviors in each group, rather than just one hypothesis is generally true (Hinshaw, 1992).

Children with ADHD have the propensity to be easily affected by environmental factors. Thus, their behaviors need to be evaluated from different viewpoints in different situations, and, it is very important to assess children's ADHD tendencies at home as well as school setting. As known, any intervention with children with ADHD should begin with appropriate assessment. For a child to be diagnosed with ADHD, symptoms must be observable in him/her at least in two different situations, as stated in the definition above. In addition, for diagnosis by a child psychiatrist, he/she needs some other providers of relevant information (DuPaul & Stoner, 2003). If children show different ADHD-like symptoms in different situations, for instance at school and at home, some specific environmental factors might affect their problematic behaviors. One of a good measuring scales for evaluation by parents is Conners' Parent Rating Scales – Revised developed by Conners, Sitarenios, Parker, and Epstein (1998). It contains 80 items of seven factors (27 items in the shorter version), and is thus believed to be good for detailed evaluation of children's behaviors. Still, it has too many items to be used for screening of children. Another scale of this type, the ADHD-Rating Scale-IV (ADHD-RS) developed by DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998), complies with the diagnostic criteria of DSM-IV and is standardized based on abundance of data. This ADHD-RS is relatively easy to use, and is suitable for screening (DuPaul, Power, Anastopoulos, et al., 1998; DuPaul, Power, McGoey, et al., 1998).

In this study, we attempted to standardize the Japanese version of home form of the ADHD-RS. We have examined reliability and validity of this scale. For the validation, we confirmed the factor structure and examined the relationships with a children's intelligence quotient (IQ), standardized achievement scores, and school teacher ratings of needs for special care. In addition we examined the relationships with child-rearing style of the parents.

2. Method

2.1. Participants

Our survey was conducted in a city X, Aichi Prefecture, located in central Japan. This city is a residential area adjacent to the central city of the region, accommodating some 80,000 residents. The city's residents consist of many different types of households, with some commuting to the adjacent central city and others working for local offices and plants within the residential city. This city, therefore, provides appropriate data that represent the demography of Japan. We conducted a questionnaire survey with the parents or rearers of all the children going to the public nursery schools (middle [4–5] and senior [5–6] ages), elementary, and lower-secondary schools. Final data set comprised of 5977 children (3119 males and 2858 females). Our data included no children going to special education classes. Table 1 shows a breakdown of the children by their sex and school grade. There was no significant difference in the male–female ratio across the school grades covered ($\chi^2(8) = 14.22, n.s.$). Note that the number of participants differs from one variable to another.

2.2. Measures

2.2.1. ADHD-RS

We employed the Japanese version of the ADHD-Rating Scale translated by DuPaul, Power, Anastopoulos, and Reid (2008). On the basis of the ADHD criteria of DSM-IV, this scale consists of two subscales to measure the two major characteristics of ADHD, Inattentive (9 items) and Hyperactive-Impulsive (9 items). Both school and home form of the ADHD-RS have been confirmed to have sufficient reliability and validity (DuPaul, Power, Anastopoulos, et al., 1998). Our survey employed ADHD-RS and asked the parents or rearers to respond to all the items for their children, as DuPaul, Power, Anastopoulos, et al. (1998) and

Table 1
Detail of grade and sex of participants of this survey.

Grade (age)	Male	Female	Total
Nursery school			
Middle (4–5)	142	137	279
Senior (5–6)	134	137	271
Elementary school			
1 (6–7)	398	315	713
2 (7–8)	358	363	721
3 (8–9)	388	336	724
4 (9–10)	336	300	636
5 (10–11)	343	315	658
6 (11–12)	301	252	553
Lower-secondary school			
7 (12–13)	294	250	544
8 (13–14)	220	236	456
9 (14–15)	205	217	422
Total	3119	2858	5977

DuPaul, Power, McGoey, et al. (1998) did. As in the prior surveys, parents or rearer rated each item on a 4-point Likert scale ranging from “Not at all, rarely (0)” to “Sometimes (1)” to “Often (2)” and “Very often (3).” Therefore, the higher a child’s score is, the more ADHD tendency he/she has.

2.2.2. Parental rearing styles scale for parent training (PSPT)

We employed the scale to measure a parents’ or rearers’ style of rearing a child developed by Tsujii (2009). This scale consists of five subscales, Praising, Scolding, Easiness in bringing up, Social support, and Difficulty in bringing up. The reliability and validity of this scale was verified (Tsujii, 2009). Parents or rearer rated each item on a 4-point Likert scale ranging from “Does not apply at all (1)” to “Does not (usually) apply (2)” to “Hard to judge (3),” “Applies (4),” and “Applies very well (5).”

2.2.3. New Kyoken support to intelligence tests for each school grade

For elementary school children and lower-secondary school children, we measured their intelligence using New Kyoken Support to Intelligence Tests for Each School Grade, developed by Okamoto, Shibuya, Ishida, and Sakano (1993). This is a collective intelligence test conducted at the beginning of a school year to obtain each child’s intelligence quotient.

2.2.4. Kyoken norm referenced test of academic performance

For elementary school children and lower-secondary school children, we measured their academic performance. This scale is a standardized achievement test frequently used in Japan developed by Tatsuno, Ishida, Hattori, and Teachers of at Tsukuba University’s Elementary and Junior High Schools (2002). It evaluates children’s performance on a scale of 100 points in each subject. Our survey employed the children’s scores in Japanese and math. The test was conducted at the beginning of the school year.

2.2.5. Teacher ratings of needs for special care

For the first and second graders in elementary school, we asked their classroom teachers to evaluate whether or not each student needs special care in a daily class.

2.3. Procedure

For the parents or rearers, we prepared a questionnaire consisting of ADHD-RS and the PSPT, and distributed to the parents or rearers through the children’s classroom teachers in September. The survey required almost a month to complete, from September to October 2009. For the IQ and scores of the standardized achievement tests of the children as well as the ratings of children’s needs for special care, we used the teachers’ evaluations. This survey was conducted in accordance with an agreement signed by and between the city and Hamamatsu University School of Medicine. For protection of personal data, we adhered to the city’s information security policies. Thus, we paid due attention to the ethical issues related to the survey.

3. Results

3.1. Confirmatory factor analysis and reliability of ADHD-RS

We performed confirmatory factor analysis to examine the factor structure of Japanese version of ADHD-RS. Two models were compared: One presumed two factors, Inattentive and Hyperactive-Impulsive, following the prior studies (DuPaul,

Table 2
The result of confirmatory factor analysis of ADHD-RS and mean (SD) of items.

Item	F1	F2	M (SD)
<i>Inattentive</i> ($\alpha = .88$)			
Fails to give close attention to details or makes careless mistakes in schoolwork.	.55		1.06 (.69)
Has difficulty sustaining attention in tasks or play activities.	.74		.56 (.72)
Does not seem to listen when spoken to directly.	.60		.48 (.68)
Does not follow through on instructions and fails to finish work.	.71		.32 (.58)
Has difficulty organizing tasks and activities.	.72		.61 (.75)
Avoids tasks (e.g., schoolwork, homework) that require sustained mental effort.	.69		.64 (.80)
Loses things necessary for tasks or activities.	.64		.63 (.73)
Is easily distracted.	.74		.79 (.79)
Is forgetful in daily activities.	.66		.62 (.76)
<i>Hyperactive-Impulsive</i> ($\alpha = .85$)			
Fidgets with hands or feet or squirms in seat.		.62	.59 (.77)
Leaves seat in classroom or in other situations in which remaining seated is expected.		.64	.16 (.46)
Runs about or climbs excessively in situations in which it is inappropriate.		.67	.16 (.48)
Has difficulty playing or engaging in leisure activities quietly.		.72	.25 (.55)
Is "on the go" or acts as if "driven by a motor."		.70	.27 (.61)
Talks excessively.		.55	.59 (.80)
Blurts out answers before questions have been completed.		.60	.43 (.64)
Has difficulty awaiting turn.		.65	.22 (.51)
Interrupts or intrudes on others.		.64	.24 (.54)

Note. Factor correlation is .82.

Power, Anastopoulos, et al., 1998; DuPaul, Power, McGoey, et al., 1998). The other model supposed only a single factor of ADHD. We found the fit indices of the two-factor model as GFI = .91, AGFI = .89 and RMSEA = .08, all sufficient values. Although the correlation between the factors was rather high at $r = .82$, it was consistent with the value of the prior studies. Next, the single-factor model had the fit indices of GFI = .86, AGFI = .82, and RMSEA = .09, indicating poor fitness of the model. We can decide, therefore, that the two-factor structure is more appropriate. Table 2 shows the factor analysis results with the two-factor model as well as the mean and SD of the items. With all of the items, we recognized some floor effect.

We obtained Cronbach's alphas for the two subscales of ADHD-RS and found them sufficient, .88 for Inattentive and .85 for Hyperactive-Impulsive. These values show sufficient reliability of the scales.

3.2. The sex and grade differences of ADHD-RS

We conducted sex \times grade analyses of variance (ANOVA) with the two subscale scores and the total score of ADHD-RS as dependent variables (Table 3).

With Inattentive, the sex \times grade interaction effect was nonsignificant ($F(10, 5955) = 1.13, n.s.$). The main effect of sex was significant ($F(1, 5955) = 176.46, p < .001$), suggesting that males scored higher than did females. The main effect of grade was significant ($F(10, 5955) = 4.56, p < .001$). Second grader scored higher than first, sixth, and ninth graders did. Third graders scored higher than first and ninth graders did. And, fourth graders scored higher than did first graders.

With Hyperactive-Impulsive, the sex \times grade interaction effect was significant ($F(10, 5955) = 3.08, p < .01$). Simple main effects of the sex were significant on the middle nursery through seventh grade children, with the males scoring higher than the females across all those grades. The simple main effects of grade was significant both in males and females, suggesting that higher their grade is, lower they scored.

With the total score of ADHD-RS, the sex \times grade interaction effect was nonsignificant ($F(10, 5955) = 1.82, n.s.$). The main effect of sex was significant ($F(1, 5955) = 210.32, p < .001$), suggesting that males scored higher than did females. The main effect of grade was significant ($F(10, 5955) = 10.40, p < .001$). Middle nursery and second graders scored higher than first graders and fifth through ninth graders did. Senior nursery and fourth graders scored higher than eighth and ninth graders did. First graders scored higher than did ninth graders. And, fourth graders scored higher than sixth through ninth graders did.

3.3. Comparison between Japanese data and USA data of ADHD-RS

We compared the Japanese ADHD-RS scores obtained in our survey to those of the US collected by DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998). The scores are presented in Table 4. Note that we compared only three age groups, 5–7 years of age, 8–10 years of age, and 11–13 years of age, since our participants were limited in age. Also, it is a very common that children are grouped not by their physical age but by their school grades when examining the developmental differences in Japan. For this reason, our survey grouped the participants according to their school grades to match the age classifications of DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998) for this comparison.

Our analysis found no significant difference in the Inattentive in any of the boy groups between the two nations. Among the females, a significant difference was found only in the group aged 8 through 10 (second through fourth graders), with the

Table 3
Two-factor analyses of variance (ANOVA) of scale scores of ADHD-RS by sex and grade with Bonferroni multiple comparison ($p < .05$).

Grade (age)	Male	Female	Sex × Grade		Sex	Grade
	M (SD)	M (SD)	F		F	F
Inattention			1.13		176.46***	4.56***
Middle (4–5) ¹	6.51 (5.07)	4.94 (4.32)			M > F	4 > 3, 8, 11
Senior (5–6) ²	5.96 (3.88)	4.78 (3.99)				5 > 3, 11
1 (6–7) ³	5.71 (4.30)	4.53 (3.64)				6 > 3
2 (7–8) ⁴	7.41 (5.48)	5.17 (4.41)				
3 (8–9) ⁵	7.10 (5.20)	5.25 (4.42)				
4 (9–10) ⁶	7.01 (5.09)	5.01 (3.93)				
5 (10–11) ⁷	6.50 (5.21)	4.70 (3.99)				
6 (11–12) ⁸	6.58 (5.30)	4.27 (3.98)				
7 (12–13) ⁹	6.40 (4.86)	4.63 (4.16)				
8 (13–14) ¹⁰	6.08 (4.94)	4.68 (3.95)				
9 (14–15) ¹¹	5.75 (4.77)	4.64 (4.11)				
Hyperactive-Impulsivity			3.08**		188.60***	27.38***
Middle (4–5) ¹	5.43 (4.87)	3.68 (3.54)	16.95***	M > F	M > F	1 > 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Senior (5–6) ²	4.93 (4.71)	3.23 (3.60)	15.37***	M > F		2 > 6, 7, 8, 9, 10, 11
1 (6–7) ³	3.90 (3.82)	2.67 (3.02)	20.89***	M > F		3, 4, 5 > 7, 8, 9, 10, 11
2 (7–8) ⁴	4.55 (4.52)	2.41 (2.86)	65.61***	M > F		6 > 9, 10, 11
3 (8–9) ⁵	4.24 (4.42)	2.61 (3.71)	37.80***	M > F		7, 8 > 10, 11
4 (9–10) ⁶	3.65 (4.25)	2.09 (2.70)	30.64***	M > F		
5 (10–11) ⁷	3.16 (4.06)	1.99 (2.87)	17.64***	M > F		
6 (11–12) ⁸	3.33 (4.07)	1.62 (2.41)	31.68***	M > F		
7 (12–13) ⁹	2.70 (3.50)	1.62 (2.91)	12.34***	M > F		
8 (13–14) ¹⁰	1.95 (2.71)	1.47 (2.02)	2.12			
9 (14–15) ¹¹	1.80 (2.71)	1.49 (2.71)	.79			
			M: 22.32***	1 > 3, 5, 6, 7, 8, 9, 10, 11 2 > 6, 7, 8, 9, 10, 11 3 > 9, 10, 11 4 > 6, 7, 8, 9, 10, 11 5 > 7, 8, 9, 10, 11 6 > 9, 10, 11 7, 8 > 10, 11		
			F: 7.99***	1 > 3, 5, 6, 7, 8, 9, 10, 11 2 > 7, 8, 9, 10, 11 3, 5 > 8, 9, 10, 11		
ADHD-RS total			1.82		210.32***	10.40***
Middle (4–5) ¹	11.94 (9.41)	8.62 (7.31)			M > F	1, 4 > 3, 7, 8, 9, 10, 11
Senior (5–6) ²	10.88 (8.02)	8.01 (7.14)				2, 6 > 10, 11
1 (6–7) ³	9.61 (7.57)	7.20 (6.15)				3 > 11
2 (7–8) ⁴	11.96 (9.46)	7.58 (6.66)				5 > 7, 8, 9, 10, 11
3 (8–9) ⁵	11.34 (9.00)	7.86 (7.60)				
4 (9–10) ⁶	10.66 (8.79)	7.11 (6.01)				
5 (10–11) ⁷	9.66 (8.70)	6.70 (6.38)				
6 (11–12) ⁸	9.91 (8.79)	5.88 (5.92)				
7 (12–13) ⁹	9.10 (7.68)	6.25 (6.58)				
8 (13–14) ¹⁰	8.03 (7.17)	6.15 (5.46)				
9 (14–15) ¹¹	7.55 (6.88)	6.13 (6.36)				

** $p < .01$.

*** $p < .001$.

Japanese females scoring higher than their US counterparts. In Hyperactive-Impulsive, in all of the groups, both males and females, the Japanese children scored lower than did the children in the US. In total score, a significant difference was found in the males and females aged second through seventh (senior nursery through first graders) and the males of aged 11 through 13 (fifth through seventh graders). In any of these groups, the Japanese children scored below their US counterparts.

3.4. Correlations of ADHD-RS with study variables

Table 5 shows the correlations between ADHD-RS and the study variables. The correlations between ADHD-RS and IQ were nearly zero, while the correlations between ADHD-RS and standardized achievement test scores were significant and negative in all cases although the values were small. Totally, ADHD-RS shows significant relationships with PSRT. ADHD-RS was negatively related to Praising, Easiness in bringing up, and Social support, and positively related to Scolding and Difficulty in Bringing up.

Table 4
Descriptive statistics of home form of the ADHD-RS.

Age (grade in Japan)	This study				DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998)				Comparison between country	
	Male		Female		Male		Female		Male	Female
	N	M (SD)	N	M (SD)	N	M (SD)	N	M (SD)		
Inattention										
5–7	532	5.77 (4.20)	452	4.60 (3.75)	353	5.94 (5.08)	314	4.51 (4.45)	.51	.31
8–10 (2–4)	1082	7.17 (5.26)	999	5.15 (4.28)	289	6.65 (5.33)	327	4.17 (4.36)	1.49	3.54**
11–13 (5–7)	938	6.49 (5.13)	817	4.54 (4.04)	149	6.70 (6.27)	173	4.61 (5.12)	.38	.16
14–18	–	–	–	–	133	5.70 (5.36)	225	4.07 (4.57)		
Hyperactive-Impulsive										
5–7	532	4.16 (4.09)	452	2.84 (3.22)	353	6.59 (5.56)	314	5.00 (4.53)	7.05**	7.25**
8–10 (2–4)	1082	4.16 (4.41)	999	2.38 (3.13)	289	5.53 (5.25)	327	3.39 (3.79)	4.06**	4.34**
11–13 (5–7)	938	3.07 (3.90)	817	1.76 (2.75)	149	4.79 (5.54)	173	2.88 (3.48)	3.64**	3.95**
14–18	–	–	–	–	133	3.68 (4.32)	225	3.29 (3.82)		
ADHD total										
5–7	532	9.93 (7.70)	452	7.45 (6.47)	353	12.54 (9.97)	314	9.51 (8.17)	4.16**	3.73**
8–10 (2–4)	1082	11.33 (9.09)	999	7.53 (6.81)	289	12.18 (9.81)	327	7.56 (7.51)	1.32	.06
11–13 (5–7)	938	9.56 (8.42)	817	6.31 (6.31)	149	11.50 (11.32)	173	7.49 (7.84)	2.00*	1.85
14–18	–	–	–	–	133	9.38 (8.96)	225	7.36 (7.74)		

* $p < .05$.
** $p < .01$.

Table 5
Correlations of ADHD-RS with study variables.

	Inattention	Hyperactive-Impulsive	ADHD total
IQ (N = 4141)	-.09*	-.08	-.09
Standard achievement test			
Japanese (N = 4390)	-.17**	-.13**	-.16***
Math (N = 4390)	-.16***	-.11***	-.15**
Parental rearing styles			
Praising (N = 5354)	-.36***	-.25***	-.34***
Scolding (N = 5409)	.42***	.38***	.43***
Easiness to bring up (N = 5380)	-.32***	-.28***	-.33***
Social support (N = 5356)	-.17***	-.12***	-.16***
Difficulty in bring up (N = 5374)	.32***	.24***	.31***

* $p < .05$.
** $p < .01$.
*** $p < .001$.

3.5. Comparison between students with and without needs for special care

We compared the ADHD-RS scores between children with needs for special care and those without the needs rated by their school teachers (Table 6). Students who need special care scored significantly higher in two subscale scores and total score. This suggests that intensity of the ADHD tendency evaluated by their parents or rearers was consistent with teachers' evaluation of needs for special care.

4. Discussion

4.1. Factor structure, reliability, and validity of ADHD-RS in Japan

We examined the factor structure of ADHD-RS by using a confirmatory factor analysis and found that a two-factor structure of Inattentive and Hyperactive-Impulsive fit the data, consistent with prior studies (DuPaul, Power, Anastopoulos,

Table 6
The comparison between students who need special care and who do not need special care in ADHD-RS scores.

	Children without needs for special care		Children with needs for special care		t
	N	M (SD)	N	M (SD)	
Inattention	1388	4.88 (4.57)	49	10.20 (6.66)	-5.55***
Hyperactive-Impulsive	1410	2.92 (3.62)	50	6.22 (5.75)	-4.03***
ADHD total	1386	7.75 (7.64)	48	16.46 (11.63)	-5.15***

*** $p < .001$.

et al., 1998; DuPaul, Power, McGoey, et al., 1998). With the reliability of the scale, we obtained sufficient alpha coefficients, indicating good reliability. Future studies should examine the reliability with the test–retest method.

We examined the validity of the scales in terms of the relationships with IQ and standardized achievement tests (Japanese and math). As a result, we found almost no relationships between the ADHD-RS scores and IQ, while there were significant negative relationships between the ADHD-RS scores and standardized achievement test scores. These results agree with DuPaul and Stoner (2003), who suggested that ADHD has nothing to do with IQ but negative relationships with academic achievements, thus suggesting the scale's validity.

We also compared the scores of the children with and without needs for special care evaluated by teachers, and found that the children with needs for special care scored significantly higher than the children without the needs. Since this result is in agreement with DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998), it suggests the construct validity of the Japanese version of home form of the ADHD-RS. Parents may be capable of seeing their children's ADHD tendencies from multiple viewpoints to some extent.

4.2. Sex and grade differences of ADHD-RS scores in Japan

Our analyses of variance yield significant sex \times grade interaction effects for Hyperactive-Impulsive. Among both the females and males, the grade was found to have a significant simple main effect, with the score coming down as the grade went up. Also, among the middle nursery children through seventh graders, the sex had a significant simple main effect, with the males always scoring higher than their female children. This analysis in terms of interactions suggested that the difference between the two sexes, which was evident among lower-grade children, diminished as children grew older until it finally disappeared.

The sex had a significant simple main effect, with the males showing stronger ADHD tendencies than the females. This finding is in agreement with the results of DuPaul, Power, Anastopoulos, et al. (1998) and DuPaul, Power, McGoey, et al. (1998), which shows that males show stronger ADHD tendencies than females do in Japan as well. This also agrees with the common impression held at classrooms.

4.3. Difference between Japanese data and USA data of ADHD-RS scores

We compared the scores between the US and Japan and found that the Japanese children scored lower than their US children on Hyperactive-Impulsive in all the age groups, both males and females. In contrast, in Inattention, no significant difference was found between the two nations, in any age group of males. In addition, Japanese females aged 8 through 10 scored higher than US children. Because the results in Hyperactive-Impulsive were in line with the corresponding comparison results of teachers' evaluations, many Japanese children might have less hyperactive tendency than do the US ones. In Japanese culture characterized by collectivism, everyone is appreciated for reading the situation and not disturbing anyone else (Jonhson, 1993; Markus & Kitayama, 1991). This cultural norm is internalized into children by their parents' discipline and teachers' education. As they grow up in this Japanese culture, they might learn to suppress their hyperactivity. On this issue, Barkley (1998) compared the US and Japanese children in terms of introversion, a dimension of personality deeply related to hyperactivity, and found that many Japanese children are more introverted than their US children, which supports our understanding of our comparison result.

On the other hand, in inattention, no significant difference was found between the two nations among males, while the Japanese females of the 8 through 10 age groups scored higher than did their US children. This contradicts the comparison results of teachers' evaluations. Of this, we can have different interpretations: it might suggest some characteristics of many Japanese females of this age group, or it might reflect some characteristics of their parents' evaluation frameworks. Since no significant difference was found in any other age groups of females or in any age group of males, we can conclude that no significant difference exists between the US and Japan, as a whole. Currently, no clear-cut interpretation is available, and more researchers are required.

4.4. The relationships between ADHD-RS and PSPT

We had exploratory analysis of the correlation between ADHD-RS scores and the parental rearing styles. As a whole, ADHD-RS showed significant relationships with parental rearing styles. While Praising, Easiness in bringing up, and Social support were negatively associated with ADHD-RS, Scolding and Difficulty in bringing up were positively associated with ADHD-RS. These findings suggest that parents or rearers who consider their children as having high ADHD tendencies scold their children more often than praising them and find it difficult to bring up a child. At the same time, we saw a tendency among these parents or rearers that they do not enjoy bringing up a child. In Europe and North America, generally, researchers have pointed out that many of the parents or rearers of ADHD children scold their children very often and do not praise them often (Barkley, 1995). Our survey results agree with this, suggesting that similar tendencies exist in Europe, North America, and Japan. In Japan, parents or rearers often tell their children to consider other people's viewpoints and not to disturb others or make them unhappy. This is the way a child is expected to control his/her behaviors in Japan (Jonhson, 1993). In doing so, parents or rearers often tell the children to consider emotions and empathize with others, in order to make the children follow their instructions. This is in strong contrast to the Western way (Doi, 1971). Even many Japanese parents

or rearers become overstressed by some ADHD symptoms and scold the child more and praise them less. For the reason, parents or rearers found it hard to bring up their children. “Easiness in bringing up” is the scale for measuring behaviors in early childhood (Tsuji, 2009). We found a negative correlation between ADHD-RS and this subscale. This suggests that children with ADHD have some temperaments that made it hard for parents or rearers to bring up. There is the study reporting the relationships between ADHD and young children's temperaments (Barkley, 1998). The results of this study agree with this study.

4.5. Limitation and perspectives

We conducted a large-scale survey using the home form of the ADHD-RS to compare the scores between the US and Japan and to examine the correlates of ADHD-RS and the sex and grade differences of ADHD tendency. We have found that ADHD-RS has sufficient reliability and validity, and provided a basic data of ADHD in Japanese children. However, some parts of our results did not agree with some prior studies and what we know from our experiences. For instance, while some researchers suggested the link between ADHD and academic problems (Barkley, 1998; McConaughy et al., 1988), parents or rearers' rated inattention was not related to academic performance in this study. We consider that this difference reflects the different viewpoints of evaluators. Parents' or rearers' evaluations based on the children's behaviors at home can separate inattention from academic performance. This suggests that it is important to use assessment from multiple viewpoints. Inattention evaluated by teachers comes from children's behavior in their classroom, and it may differ from inattentive behavior evaluated by parents or rearers. In addition, in our survey results, the second graders scored higher than the first graders and middle or senior nursery children did. This result is in contradiction with research results outside Japan. This result suggests that standards of evaluation vary with children's age in Japan. Thus, more researches are required in ADHD screening measurement by parents or rearers. It is needed to include more items tapping the behaviors that are hard to evaluate and to set up cutoff values for each age group. Moreover, though this surveyed covered only nursery, elementary and lower-secondary children, a future survey should cover a broader range of schools to reveal developmental differences.

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ADHD と子ども虐待

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抄録：あいち小児保健医療総合センターの子育て支援外来を受診した被虐待児916名中、初診において、ADHDの診断を受けた者は153名（男児130名女児23名）であった。このうち92名（男児75名、女児17名）に何らかの解離性障害の症状が認められた。抗多動薬がそれなりに有効であった者と、そうでなかった者に分けられ、有効であった者は48名（男児43名女児5名）で、反抗挑戦性障害は抗多動薬群に有意に多いが、愛着障害、行為障害はその他の薬物群に有意に多かった。元々のADHDの基盤がある者に関しては、抗多動薬は有効な者が多く、全体としては軽症であるが、ADHD診断が可能な抗多動薬が無効な群は、どうやら非常に重症な愛着障害を背後に持つ被虐待児であることが示された。

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I. はじめに
一問題の所在一

注意欠如多動性障害（ADHD）と子ども虐待は、複雑な論議を引き起こす問題になっている。この問題には、わが国の児童青年期精神医学における独自の状況が色濃く反映されており、それについても触れる必要がある。はじめに論点となる問題を明確にしておきたい。

第一に、世界的なレベルで、生物学的な要因を中核に考えられてきた膨大な ADHD 研究の中では、maltreatment（子育て不全と訳す）による反応性愛着障害など、子ども虐待に認められる一

連の ADHD 類似の臨床像に対して、大きな関心を払ってこなかった。むしろ ADHD の一連の併存症としての反抗挑戦性障害や行為障害に対して多くの調査が行われてきた⁶⁾。

第二に、DSM-Ⅲに始まるカテゴリー診断学および操作的診断基準は、病因を特定しないことを謳っていた。つまり病因が生物学的な脆弱性であろうと、子育て不全によって引き起こされた後遺症であろうと、診断基準を満たす限り ADHD と診断することは問題ない。もちろん診断の意味という問題はあるが、これについては後に検討を行う。

第三に、そのようなカテゴリー診断学で診断を行った場合に混入しやすい児童青年期の精神科的問題の中に、近年大きな論争を生じた一群がある。それは児童期の双極性障害の問題である。ADHD と双極性障害と子育て不全とは、相互に要因としても結果としても絡む可能性を持つ⁷⁾。

さらに、わが国において独自の問題が重なる。第一に、発達障害全体が、広汎性発達障害

ADHD and child abuse.

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(PDD) への臨床的な研究と検討が中心となっており、その結果、わが国の状況は、世界的な基準に照らし合わせれば ADHD の過小診断、PDD の過剰診断と言えるのではないかとと思われることである。ただし実際に二つの国で受診した児童について筆者の経験では、例えばアメリカ合衆国で ADHD と診断された中に、ADHD 評価尺度 (ADHD-RS) や PDD のチェックリストを用いて比較をしてみても、PDD 診断 (ただし高機能群であり社会的適応障害は比較的軽微) が正しいと考えられる児童がほとんどであり、むしろ欧米における ADHD の過剰診断、PDD の過小診断と言うべきではないかと実感される。これは社会性の問題に敏感なわが国と、行動上の問題に敏感な欧米の文化差を背景とするのではないかと考えられ、判断が難しい問題である。

第二に、わが国における小児への薬物療法のきわめて異常な状態である。ほとんどの向精神薬が小児における承認を得ていない orphan drug であり、世界の標準的な薬物療法がわが国においてできないことが続いていた。その結果、非常に限られた使用可能な薬物による独自の進化という、臨床薬理学におけるガラパゴス島状況が見られる。ADHD においても例外ではない。最も基本的な ADHD 治療薬リタリン[®] (methylphenidate) の使用ができず、その徐放剤の使用に登録制という著しい制限がかけられた世界に類のない状況である。

第三に、欧米以上に子ども虐待に対する医療制度の取り組みは遅れており、その結果、子育てで不全に起因する慢性のトラウマが、精神科臨床において考慮されてこなかった。成人の ADHD と被虐待の問題のはるか以前に、児童における子ども虐待を巡る基礎的な臨床データが、わが国では欠落しているのである。

このような事情を踏まえた上で、臨床的な視点から ADHD と子ども虐待の問題を検討してみたい。あいち小児保健医療総合センター (以下あいち小児センター) は、子ども虐待の専門外来を持つわが国唯一の医療機関である。同時に軽度発達障害治療センターとしても機能してきた。

II. 子育て支援外来を受診した ADHD の解析

2001年11月の開院から、2009年10月末までの8年間にあいち小児センターの子育て支援外来を受診した被虐待児は総数916名であった (表1)。初診において、ADHD の診断を受けた者はこのうち153名 (男児130名、女児23名) であった。しかしこれまでわれわれはいくつかの報告を行ったように、被虐待児において ADHD の3症状である多動、不注意、衝動性の何らかの症状を示す者は非常に多く、全体の771名 (84.2%) に及ぶ。脱抑制型の反応性愛着障害において、ADHD 類似の症状を示すことは稀ではなく、この両者の鑑別は非常に困難である。ADHD 診断を行った153名はこの事実を考慮してもなお、著しい多動、不注意が認められた児童である。男女比を見ると5.7対1であり、一般人口における ADHD の男女比にはほぼ一致している。もし、子ども虐待の結果生じるものであるのならより男女比は近づくはずであり、このことは ADHD がプライマリの問題であることを強く示唆するものである。

われわれは、反応性愛着障害の結果生じた ADHD 様の病態と、従来の ADHD の鑑別点として、臨床的には解離症状の有無が一つの決め手になると報告した⁷⁾。従来の ADHD において解離性障害の存在は除外診断に含まれ、一般に ADHD に解離が併存することはないからである。この ADHD 診断の153名について調べてみると、92名 (男児75名、女児17名) に何らかの解離性障害の症状が認められていた。このことは、ADHD がプライマリにあったとしても、それに子ども虐待が加算された場合には解離が生じうると考えられ、従来の除外診断を機械的に適応することが困難な場合も少なくないことを示す。

さて、この153名に対して治療的な対応を試行してみると、著しい違いとして、抗多動薬がそれなりに有効であった者と、そうでなかった者に分けられた。それなりに抗多動薬が有効であった者は48名 (男児43名、女児5名) で、一方、抗多動薬が無効であった者は105名であった。こちらの方のグループに用いられているのは一般に、抗精

表1 あいち小児センターで診療を行った子ども虐待の症例 (2001.11~2009.10)

虐待の種類	男性	女性	合計	%
主として身体的	295	125	420	45.9
主としてネグレクト	87	59	146	15.9
主として心理的	97	88	185	20.2
主として性的	50	108	158	17.2
代理ミュンヒハウゼン	2	5	7	0.8
合計	531	385	916	100

神病薬、気分調整薬、選択的セロトニン再取り込み阻害薬 (SSRI) などの薬物であり、一般的な被虐待児のハイテンションや生理学的な乱れを是正する目的で使用される薬物と変わりがなかった。

Atomoxetine を用いた者が12名で、残り36名はリタリンもしくはコンサータ[®]を用い、外来でのフォローアップが継続している者は、1名以外コンサータに切り替えた。現在でもリタリンを使用している1名は、治療経過中に原因がよくわからない傾眠発作を生じるようになり、コンサータの効きが不十分で、非定型的なナルコレプシーとしてリタリンを使用し続けている。

抗多動薬が有効な群の特徴を見るために、いくつかの併存症について検討を行った (表2)。抗多動薬群に有意に多く認められるものと、逆に認められないものが混在しており、反抗挑戦性障害は抗多動薬群に有意に多いが、愛着障害、素行障害はその他の薬物群に有意に多かった。ちなみに性的虐待は抗多動薬群で1名のみであった。このような特徴を見ると、どうやら解離の併存は変わらないものの、抗多動薬が有効な ADHD 診断の群の方が、子ども虐待という点では軽症である。一方、無効群はというと、愛着障害90%、解離性障害61%、行為障害56%など、きわめて重症であることを示しており、ADHD 診断においてもなお、元々の ADHD に子ども虐待が加算された群と、基盤として非常に重症な愛着障害と子育て不全があると想定される群とに分けられるのではないかと考えられる。

言い換えると、元々の ADHD の基盤がある者

表2 抗多動薬が有効な群とそれ以外の群の比較

	抗多動薬群 n=48 (%)	その他の 薬物使用群 n=105 (%)	χ^2 乗値	p 値
愛着障害	37 (77.1)	95 (90.5)	5.0	0.026*
解離性障害	28 (58.3)	64 (61.0)	0.09	n.s.
ODD	18 (37.5)	19 (18.1)	6.76	0.009*
CD	17 (35.4)	59 (56.2)	5.69	0.017*
性的虐待	1 (2.1)	16 (15.2)	Fisher 法	0.023*

ODD: 反抗挑戦性障害, CD: 素行障害, * $p < 0.05$

に関しては、抗多動薬は有効な者が多く、全体としては軽症であるが、ADHD 診断が可能で抗多動薬が無効な群は、どうやら非常に重症な愛着障害を背後に持つ被虐待児である。

Ⅲ. それぞれの症例

それぞれの代表例を取り上げてみる。

〔症例1〕男児、初診時5歳、ADHD (混合型)

母親は2回の結婚と2回の離婚をし、その後単身で子どもと生活をしてきた。夫からのDVがあったという。母親は子ども達に激しい虐待を加えており、患児の目を箸で刺したといったきわめて激しい身体的虐待が記録されている。姉はミニ母親のようになっており、患児や妹に激しい暴力をふるい、また自分が母親のおなかの中にいる間にチンチンを落としてしまったのを患児が拾って付けた、私のチンチンを返せと、患児や妹を下半身を裸にして性器に暴力を加えるといった虐待もあったようである。5歳で保護され一時保護所を経て里親の元で育つようになった。

はじめは会話もままならなかったが、徐々に人との交流ができるようになった。しかし里親への激しい甘えが生じ、里親の名字を名乗ることに固執し、本名をいわれるとパニックにすらなつた。学校が始まると、着席は辛うじてしていても、じっとできず、他児へのしつこい挑発行為が続き、易怒的で、また会話は一方的だったため、あらためて里親から相談を受け、服薬を開始した。この時点での ADHD-RS は不注意素点25点 (99%)、

多動衝動素点21点(97%),合計素点46点(99%)であった。ごく少量の抗うつ薬と抗精神病薬によって易怒的な状態はいくらか治まったので、知能検査を行った。全IQ82と境界知能であったが、短期記憶など注意力を反映する項目において欠落が認められたため、抗多動薬を開始した。コンサータの服用は著効し、初めて座って課題に取り組めるようになった。しかしその後もハイテンションになってフラッシュバックがひどくなり、急にかんしゃくを起こして暴れてその後ほーとなってしまふといった状況が数ヵ月おきに生じていた。7歳になって以前より非常に落ち着いてきたが、ここで食欲不振が強くなったので、コンサータをatomoxetineに変更した。その後、フラッシュバックの波が非常にあるので、atomoxetineに加えて桂枝加芍薬湯と四物湯を3ヵ月ほど服用したところ、落ち着きが非常に良くなった。8歳になって、お化けの気配はまだすと言っているが、学習にも落ち着いて取り組めていて、情緒的にも安定している。現在の処方、atomoxetine 25mg, risperidone 0.3mg, carbamazepine 30mg, 桂枝加芍薬湯1包である。

〔症例2〕 女児, 5歳, ADHD (不注意優勢型), 愛着障害, 解離性障害

症例1の妹も保護され、別の里親の元で育てられることになった。当センターで継続的な治療を受けている。5歳時点で激しいスイッチングが見られ、その後、人のものを持ってきてしまったり、小動物をいじめる、閉じ込めるといった行動が著しくなった。確認をすると「やっちゃえ、盗っちゃえ」と女性の声が聞こえるという、解離性幻聴が認められたため、少量の抗精神病薬を服用した。入学を前にして心理検査を実施したところ、兄と同じ注意力の問題が見られたのでコンサータを開始した。すると著効し、妹の方は食欲不振もなく、現在も少量の抗精神病薬および気分調整薬とともに服用を続けている。妹の現在の処方、コンサータ18mg, risperidone 0.2mg, carbamazepine 25mgである。彼女の5歳時点でのADHD-RSは不注意素点23点(99%),多動衝動素点9点(88%),合計素点32点(98%)で臨床的には混合

型であった。

この症例は、激しい虐待を受け、その後遺症である解離性障害の諸症状とハイテンション、気分の変動が認められる。しかしながらその一方で、抗多動薬は有効である。つまり、この症例はADHDの基盤がありそれに虐待が加わったと考えられる。

〔症例3〕 男児, 初診時6歳, ADHD (混合型)

父親と母親は不仲で、母親は精神科での長い治療歴があり、境界性パーソナリティ障害と診断されていた。父親から母親へのDVがあった。子どもが産まれないため、母親は養子縁組をした。それが患児である。実親に関する情報はほとんど明らかになるものがない。この家庭に0歳で養子になり主として母親によって育てられたが、父親から母親へのDVがエスカレートし、母親が怪我をすることもあり、両親は2歳にて離婚した。その後、患児3歳にて母親は再婚し、下に兄弟が産まれた。しかし今度もまた、父親から母親への激しいDVがやがて生じるようになった。さらに養父から患児へ、また幼い実子への激しい身体的虐待が生じるようになり、母親は再度離婚をした。

患児は幼児期から多動で、外出時に迷子になることもあり、保育園では集団行動が著しく苦手であった。また下の兄弟に激しいやきもちを焼き、まだ幼い兄弟に対して、危険な暴力をふるうことがあり、母親は対応に苦慮していた。母親自身も気分の上下が著しく、特に季節の変わり目には気分変動が強くなり、全く動けなくなることもあり、また非常に被害的になることもあり、患児への体罰もあった。6歳にて初診し、ADHDと診断した。この時に、解離性の幻覚と考えられる「お化けの声・お化けの姿」の訴えがあり、解離性障害の併存が認められた。6歳時点でのADHD-RSは不注意素点27点(99%),多動衝動素点12点(85%),合計素点39点(97%)であった。またこの当時から気分の変動が著しく、非常なハイテンションと、むしろ不機嫌な状況とがめまぐるしく交代で認められた。Methylphenidateの服用は全く無効で、少量の抗精神病薬とSSRIによって衝動的な行動が治まるなど、いくらか有

効であった。学校でも着席困難があり、学習の遅れが著しかった。

8歳にて母親と患児の関係が非常に険悪になり、母親に暴力を受け、さらに家を追い出されるような状況が再発したため児童相談所の介入が行われ、里親への委託がなされた。患児は預けられた年配の里親にまるで赤ちゃんのように全面的な世話を求める一方、反抗や、時に金を盗むといった非行行為も見られた。しかし当センターでの治療の継続もあって、徐々に落ち着きを見せるようになった。9歳を過ぎた頃から、ハイテンションと抑うつ的な状況の交代がさらに著しくなったため、SSRIを中止して、carbamazepineに変更した。その結果、気分変動は軽減し初めて学習やクラブ活動に熱心に取り組むことができるようになった。その後、母親からの強い要請があり、10歳にて母親の元に戻った。母親、患児、兄弟の子ども達の三つ巴で全員が不調になることも見られたが、患児ではなく弟を2ヵ月程度入院治療させるといった対応をした。患児は母親への著しい退行を示した時期があったが、母親のカルテを当センターに移動し、継続的な治療を当センターで実施した結果、母親の気分変動が軽減したこともあって、母親も何とか患児を受け止めることができるようになり、いくつかの危機的な状況を何とか事故に至らずにすごすことができた。多動は著しく軽減したが、不注意は未だに継続している。11歳現在の処方薬はrisperidone 0.2mg, carbamazepine 25mgである。

この症例は、ADHDの診断基準を満たすが、同時に愛着障害や解離性障害の症状も強く認められる。症例3に見られる諸症状が重症の愛着障害を背景にするものであることは、経過からも窺える。これらの点は症例1にも見られないわけではない。しかし抗多動薬は全く無効であった。

IV. 子ども虐待によるADHDの病理

DSMを代表とするカテゴリー診断学においては、病因を特定しないことが一つの特徴となっている。つまり、症例3においてADHDの診断を行うことは、全く問題がないと考えられる。しか

しながら診断を行う目的はというと、治療的対応を組むためであり、それゆえ、治療が規定されない診断というのは欠陥を抱えており、見直しが必要と言わざるをえない。子ども虐待は脳全体を巻き込む深刻な後遺症を生じる。その基本病理は、慢性のトラウマと愛着障害である。トラウマによって引き起こされる変化は、神経生理学的な立場から、注意集中と刺激弁別に異常が生じ刺激に対して検討を行わず即座に反応する傾向が生じる²⁾ことが指摘されている。このような過覚醒的警戒状態(hypervigilance)¹⁾はすべての刺激に過剰反応をする状態にほかならず、ADHDの臨床像に一致する。さらにあまり指摘されていないことであるが、解離症状の存在は、ADHDにおける不注意項目を陽性にするため、不注意型のADHDと診断される可能性が高くなる³⁾。子ども虐待が少なくとも後年には脳に深刻な後遺症を呈することはよく知られている。これは現実の症例を見れば一目瞭然である。症例3をはじめ被虐待児の示す症状はといえば、睡眠障害、注意力の障害という脳幹の異常が見られ、また協調運動障害、認知の凸凹という間脳、大脳皮質の問題があり、さらに衝動行為、対人関係の問題、記憶の障害は大脳辺縁系の機能不全を示唆し、実行機能の問題、学習の遅れは大脳皮質に起因すると考えられる問題である。実に、脳全体にダメージが認められるのである。症例1においても、抗多動薬は多動や不注意には有効であったとしても、解離性の幻覚など、それ以外の問題に対しては、別の治療を加えることが必要であった。提示した3症例において基本的な愛着の修復という困難な作業を里親の献身的な努力によって果たすことができた。この点は、これらの症例がある程度改善を示した最も重要な点であると考えられる。

注目すべきは症例1、3において気分変動が認められることである。彼らは双極性障害なのだろうか。最近になって症例3のような子どもの気分障害に対して、severe mood dysregulation(SMD)⁴⁾という概念が登場した。双極性障害類似の気分の上下を示す児童であるが、これまでのところ、双極性障害よりもむしろ複雑性トラウマ⁵⁾に近縁ではないかという指摘がなされている。重

度の虐待体験という強烈な脳への慢性的刺激は、海馬、扁桃核、帯状回などの記憶や感情の中樞に異常を引き起こし、その一部は気分変動の臨床像となるのではないか。このハイテンション状態がまた ADHD の診断になるのであると考えられる。われわれはかつて、ADHD と子ども虐待による多動との鑑別点を解離の有無ではないかと述べた。この見解は誤りではないが、次のように訂正が必要である。

一般の ADHD において解離は生じないが、ADHD に子ども虐待が掛け算になった症例においては解離性障害は併存することが稀ではなく、このような場合には、抗多動薬は一定の効果を示す。しかし従来の ADHD の基盤を持たない被虐待児において、ADHD 類似の臨床像を呈することは稀ではなく、そのような場合には重症の愛着障害や、解離性障害、また反社会的行動がしばしば認められる。

欧米からのレポートを丹念に見ると、ADHD における子育て不全の問題は、しばしば見られるものである。ADHD と子ども虐待との関係は、幼児期からもう一度、発達歴を辿り直し、その生来の問題とその後の環境による修飾を分けるという地道な作業を必要としている。

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