[Paper]

The "Sense of Difficulty" Related to Developmental Disorders in Japanese High School Students: A Case Study of a *Yogo* Teacher's Experience

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Abstract

This study examines the relationship between the severity of developmental disorder-related difficulties (sense of difficulty: SOD) of students who use the health room, the seriousness of their problems, and their need for assistance. Five hundred *Yogo* teachers working at high schools in the Tokyo metropolitan area are surveyed. They are asked to name one student with high support needs and one with low support needs among the students they teach and to rate these students on a checklist of developmental disorder-related difficulties. Factor and cluster analyses are conducted to examine the relationship between the clusters obtained and the level of the students' support needs. The means and standard deviations of each item on the checklist are calculated for each cluster, and each support needs level. The analysis results suggest that many students who use the health room had difficulties related to developmental disorders and that the greater the difficulties, the more likely they are to develop serious problems. We found that the greater the sense of difficulty for both ASD and ADHD disorders, the greater the risk factor for more serious problems. We suggest it is necessary to respond to students who visit the health room with mental health problems from the perspective of "developmental disorder SOD," regardless of whether they have a diagnosis.

Keywords: Sense of difficulty, developmental disorders, Japanese high schools, *Yogo* teacher, School adaptation

1. Introduction

According to the Basic School Survey for FY2020 (MEXT, 2021), Japan's high school enrollment rate is over 98.8%. Non-attendance and school maladjustment among high school students remain serious problems. It has been reported that "apathy/anxiety" was the most common reason for non-attendance, at 36.8%, followed by "disruption of daily rhythm, play, and delinquency" (12.4%), "problems surrounding friendships except bullying" (10.5%), and "maladjustment upon entering or

transferring to school or promotion" (10.5%) (MEXT, 2022). Although the number of high school dropouts has decreased over the past ten years, it has remained at the high level of 39,000 (about 1.2% of the total), which is still not ideal. Psychological factors, such as stress and emotional control, are believed to aggravate these problems (Okada, 2002). Therefore, capturing and examining the psychological aspects of students will help in responding to these problems. It has been pointed out that people with developmental disorders often face various stresses due to their characteristics and are prone to maladjustment to the environment because they do not have appropriate methods of accepting and coping with stress (Hayashi et al., 2015). Yamashita (2015) also stated the necessity of examining the possibility that developmental disorders, such as autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD), exist behind mental health problems in children. Furthermore, high school is a time when students experience major changes, both mentally and physically. It has been pointed out that students with developmental disorders, especially during this period, may become emotionally unstable with low self-esteem, which may develop into secondary disorders such as truancy, school maladjustment, and problematic behaviors (MEXT, 2010). However, a survey conducted in high schools in the Tokyo metropolitan area reported that 24.6% of the students had mild developmental disorders, and the number of students requiring special support education has been increasing annually (Tobe et al., 2013). Furthermore, the results of a recent large-scale epidemiological study (Kamio et al., 2012) on a population of elementary and junior high school students in Japan revealed that many children do not have a diagnosis of ASD but have many autistic behavioral characteristics at the subthreshold level. Moriwaki and Kamio (2013) reported significant emotional and conduct problems in approximately 10% to 20% of children with many subthreshold autistic behavioral characteristics. Considering this situation, there is an even greater need for an attitude of support that captures the "Komarikan (sense of difficulty; SOD)" that students with developmental disorders tend to have, regardless of whether they have a diagnosis. Sato (2007) describes "Komarikan" as "the feeling that a person has when they have a bad or painful experience but is unable to solve it on their own and does not know what to do. This is the feeling that a person has when he or she is in such a state of distress." In addition, he also stated that "there are cases in which the individual does not feel a sense of distress, even though they are in such a state. There are cases in which it is fully expected that the individual will fall into such a state in the future, even if no problem arises at present. Still, from the perspective of providing educational support to the individual, it is desirable to judge that a 'Komarikan' exists in these cases as well." (Sato, 2007). Takahashi (2012) pointed out that, in supporting university students with developmental disorders, it is easier to provide support by assessing the "Komarikan" caused by the characteristics of the developmental disorders rather than by identifying the characteristics of the students' developmental disorders. Furthermore, he proposed support methods that focus on university student's "Komarikan" by developing the "ASD Komarikan Questionnaire" (Yamamoto and Takahashi, 2009), "ADHD Komarikan Questionnaire" (Iwabuchi and Takahashi, 2011), and "Integrated Komarikan Questionnaire" (Takahashi, 2012). However, in Japan, there are almost no studies investigating the difficulty high school students with developmental disorders such as ASD and ADHD tend to feel. This study defines this feeling as "developmental disorder SOD" or "SOD."

A health room is where students with such mental health problems can be identified. In Japan, health room are staffed by a faculty member called a *Yogo* teacher. A "*Yogo* teacher" is a special licenced educator who supports children's growth and development through health education and health services on the basis of principles of health promotion in all areas of educational activities in school (Japanese Association of *Yogo* Teacher Education, 2003). *Yogo* teachers accurately grasp the

condition of students' health needs and environmental health and guide students with mental and physical health problems (MEXT, 2015). Therefore, it is important to make efforts for early detection and responses to these problems through health consultations (MEXT, 2017). According to the report on the survey of the status of health room use in 2016 (Japan School Health Association, 2018), the most common background factor for students who used the health room in high schools was "mainly psychological problems" at 41.6%. The percentage of *Yogo* teachers who experienced continuous support within approximately one year was 91.4%. A survey conducted on *Yogo* teachers in high schools also pointed out that many *Yogo* teachers deal with students who complain of mental and behavioral disorders (Nakano et al., 2018). Hence, there may be many students with developmental problems among those involved with *Yogo* teachers in the health room.

Therefore, this study aims to provide information to support high school students with mental health problems in Japan from the viewpoint of "developmental disorder SOD" by examining the relationship between the severity of the students' problems and their need for support ("support needs"). This study aims to provide materials for supporting high school students with mental health problems in Japan from the viewpoint of "developmental disorder SOD."

2. Method

2.1 Survey targets and methods

A questionnaire survey was conducted on 500 *Yogo* teachers enrolled in national, public, and private high schools in the Metropolitan area (Tokyo, Saitama Pref., Chiba Pref., Kanagawa Pref., Yamanashi Pref., and Gunma Pref.). The 1161 targeted schools were divided into three categories: co-educational schools, boys' schools, and girls' schools, and each school was numbered. Thereafter, a simple random sampling was conducted using a random number table, and 500 schools were selected. The following questionnaire was mailed to the selected 500 schools; the teachers were asked to answer the questionnaire and return it directly. The 204 respondents were included in the analysis (response rate: 40.8%). The survey period was from July to August 2019.

The purpose and procedure of the survey were explained in writing to school principals and *Yogo* teachers (respondents); ethical considerations were explained in writing, such as the freedom to respond, the fact that responses obtained would be statistically processed, that anonymity would be ensured when the results were published, and that consent was obtained by responding. In addition, from the viewpoint of privacy protection, the respondents were asked to provide sufficient consideration to individual cases so they would not be identified. This study was approved by the Research Ethics Committee of the Institution to which the first author belongs.

2.2 Investigation details

The questionnaire items consisted of three parts: (1) a face sheet, (2) a questionnaire about the SOD of students who use the health room and have high support needs, and (3) a questionnaire about the SOD of students who use the health room and have low support needs.

2.2.1 Face sheet

The subjects were asked to indicate the location of the school where they worked and their years of teaching experience.

2.2.2 Mental health of students with high support needs

"Please think of one of the students you were involved with in the health room who had been 'excessively absent or tardy, expelled or retained from school, or punished for student guidance

problems' and whose background was thought to contain psychological factors such as stress." Thereafter, they were asked how much the student had trouble with each item on the checklist. These were evaluated on a 5-point scale: 1, not troubled at all; 2, not very troubled; 3, undecided; 4, troubled; and 5, very troubled. This checklist consists of 12 items, 6 from the "ASD Komarikan Questionnaire" (Yamamoto et al., 2009) and 6 from the "ADHD Komarikan Questionnaire" (Iwabuchi et al., 2011), with some modifications. This checklist was designed for university students, but since a similar checklist for high school students does not exist, the authors decided to use some of the items from this checklist with changes in wording that they believe are applicable to high school students in this study. The authors also gave each item an "Item Names" that they considered appropriate.

2.2.3 Mental health of pupils with low support needs

The students were asked to complete the same checklist as in 2.2.2, "Please think of one student whom you have been involved with in the health room who does not fall into the category 2.2.2, and about whom you are particularly concerned, such as frequent use of the health room." Thereafter, they were asked about the degree to which the student had trouble with each item on the checklist, as in 2.2.2.

2.3 Analysis method

The responses to the face sheet were tabulated. Next, factor and cluster analyses were conducted on the responses to checklists 2.2.2 and 2.2.3, and the relationship between the obtained clusters and the level of support needs was examined. The mean and standard deviation of each item in the checklist were calculated for each cluster. The above analyses were conducted on the scores of 373 students (182 students with high support needs and 191 students with low support needs) whose answers were not incomplete, such as through missing values.

3. Results

Of the 204 schools that responded, 63 (30.9%) were in Tokyo, 36 (17. 7%) in Saitama Pref., 57 (27.9%) in Chiba Pref., 22 (10.8%) in Kanagawa Pref., 10 (4.9%) in Yamanashi Pref., and 16 (7.8%) in Gunma Pref.. The average teaching experience of respondents was 18.2 years (SD = 11.7).

3.1 Factor structure of the checklist

An exploratory factor analysis (maximum likelihood method, Promax rotation) was conducted on the 12 items of the SOD checklist based on the scores of 373 subjects included in the analysis. The number of factors was set to two by considering the decay pattern of eigenvalues (3.260, 2.058, 0.993, etc.) and the interpretability of the factors. However, two items had factor loadings of less than.35, so these items were excluded, and factor analysis was conducted again. The final factor pattern after rotation is shown in Table 1. Factor 1 was named the "ASD SOD factor" because high loadings were found for items related to ASD, such as "making friends," "conversation," "group," "isolation," and "others' viewpoints." Factor 2 was named the "ADHD SOD factor" because it loaded highly on items related to ADHD, such as "inattention," "multiple tasks," "impulsivity," "life rhythm," and "emotional control." To examine internal consistency, alpha coefficients were calculated for each factor, with alpha = .851 for the "ASD SOD" factor and alpha = .650 for the "ADHD SOD" factor. The correlation between the factors was .1 25. The average scores of the items included in each factor were defined as the "ASD SOD score" and the "ADHD SOD score," and the sum of the "ASD SOD score" and "ADHD SOD score" was defined as the "Developmental disorder SOD score."

Table 1 Results of the factor analysis for the SOD checklist

Item Names	Items	I	II	Commonality
Making Friends	I'm not good at making new friends	**.834**	-.019	.692
Conversation	I can't talk well with my friends	**.802**	.054	.657
Group	I feel uncomfortable in group activities	**.767**	-.035	.583
Isolation	I sometimes feel isolated	**.737**	.027	.549
Others' Viewpoints	I'm not good at imagining other people's thoughts	**.518**	-.013	.267
Inattention	I often forget things and forget promises	-.066	**.779**	.599
Multiple Tasks	I can't handle multiple tasks well	.067	**.646**	.433
Impulsivity	I sometimes act impulsively	.081	**.415**	.187
Life Rhythm	I have an irregular life rhythm	-.130	**.398**	.162
Emotional Control	I get angry easily	.065	**.340**	.125
* The authors gave each item an "Item Names" that they considered appropriate.	Factor contribution	2.800	1.522	
	Contribution rate	28.0%	15.2%	
	Interfactor correlation	.125		

3.2 Classification by SOD

Using the "ASD SOD score" and "ADHD SOD score," we conducted cluster analysis using the Ward method to obtain four clusters (Figure 1). The first included 101 subjects, the second included 111 subjects, the third included 56 subjects, and the fourth included 105 subjects.

Next, one-factor analysis of variance was conducted using the four clusters as independent variables and the "ASD SOD score" and "ADHD DOD score" as dependent variables. The results showed that there were significant differences between the clusters (ASD SOD score: $F(3, 369) = 252.42$, ADHD SOD score: $F(3, 369) = 227.00$, both $p < .001$), and multiple comparisons using Holm's method (1% level) revealed that the "ASD SOD score" was significantly higher in the first and third clusters than in the second and fourth clusters. There was also a significant difference in the "ADHD SOD score," with the result of the third cluster > second cluster > first cluster > fourth cluster. The first cluster was designated as the "ASD SOD group" because its "ASD SOD score" was high and its "ADHD SOD score" was low. The second cluster was defined as the "ADHD SOD group" because the "ADHD SOD score" was high and the "ASD SOD score" was low. The third cluster was defined as the "ASD & ADHD SOD group" because both "ASD SOD scores" and "ADHD SOD scores" tended

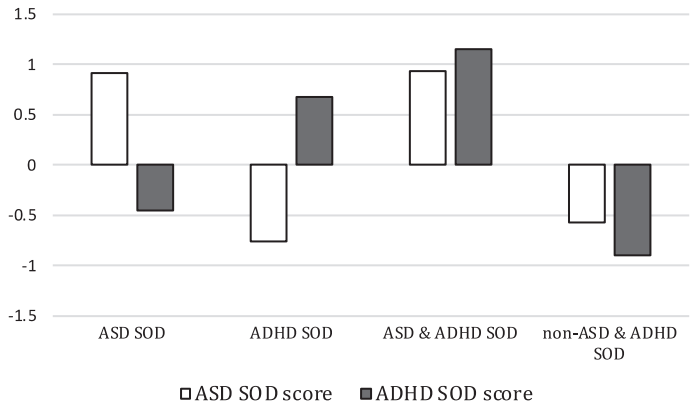

Figure 1 Standardized scores for SOD for each cluster

to be high. The fourth cluster was defined as the "non-ASD & ADHD SOD group" because both "ASD SOD scores" and "ADHD SOD scores" tended to be low (Table 2).

3.3 Relationship with the level of support needs

To examine the relationship between the degree of support needs and developmental disorder SOD, an uncorrelated t-test was conducted with the degree of support needs as the independent variable and developmental disorder SOD score as the dependent variable. The results showed a significant difference between conditions (t (371) = 5.43, $p < .001$), indicating that students with high support needs had higher developmental disorder SOD scores.

Next, to examine the relationship between the level of support needs and each cluster, each of the four clusters were divided into eight groups (high and low support needs groups), and a chi-square test was conducted on the number of people in each group; a significant relationship was found (χ^2 (3, N = 373) = 16.40, $p < .001$) The results of the chi-square test showed a significant association (Table 1). The number of students with high support needs in the "ASD & ADHD SOD group" was significantly higher, and the number of students with low support needs in the "non-ASD & ADHD SOD group" was significantly higher (Table 3).

Finally, each group's mean and standard deviation were calculated for each of the items in the checklist (Table 4).

4. Discussion

The factor analysis results for the SOD checklist showed that the checklist had a two-factor structure, namely the "ASD SOD factor" and "ADHD SOD factor," as shown in Table 1. This confirmed the validity of the checklist in capturing the sense of the difficulty of students with ASD and ADHD. However, the value of the alpha coefficient for the ADHD SOD factor was rather low at 0.650. Further refinement is needed in the future.

Cluster analysis was conducted based on these scores, and the results were divided into four clusters: "ASD SOD group," "ADHD SOD group," "ASD & ADHD SOD group," and "Non-ASD & ADHD SOD group," as shown in Figure 1. DSM-5 (American Psychiatric Association, 2013) allows for the simultaneous diagnosis of ASD and ADHD; it is possible that some of the students in the "ASD & ADHD SOD group" have both ASD and ADHD. On the other hand, the "Non-ASD & ADHD SOD group" had low scores in both the "ASD SOD score" and "ADHD SOD score," suggesting that they include students who have mental health problems without developmental

Table 2 Mean scores for each group

		ASD SOD	ADHD SOD	ASD & ADHD SOD	Non- ASD & ADHD SOD
ASD SOD Score	Average	4.49	2.72	4.51	2.92
	(SD)	(0.07)	(0.06)	(0.09)	(0.06)
ADHD SOD Score	Average	2.75	3.73	4.13	2.37
	(SD)	(0.05)	(0.05)	(0.07)	(0.05)

Table 3 Number of people belonging to each group

Variable		Cluster				
		ASD SOD	ADHD SOD	ASD & ADHD SOD	Non- ASD & ADHD SOD	Total
Support Needs	High Support Needs	50 (13.4%)	59 (15.8%)	△37 (**9.9%**)	▼ **36** (**9.7%**)	182 (48.8%)
	Low Support Needs	51 (13.7%)	52 (13.9%)	▼19 (**5.1%**)	△ 69 (**18.5%**)	191 (51.2%)
	Total	101 (27.1%)	111 (29.8%)	56 (15.0%)	105 (28.2%)	373 (100.0%)

※Regardless of the presence or absence of a diagnosis, they were divided into 4 groups. △ : Significantly more / ▼ : Significantly less

Table 4 Mean and standard deviation for each item in the checklist

		ASD SOD		ADHD SOD		ASD & ADHD SOD		non-ASD & ADHD SOD	
		High Support Needs	Low Support Needs	High Support Needs	Low Support Needs	High Support Needs	Low Support Needs	High Support Needs	Low Support Needs
ASD SOD Score	Making Friends	4.58 (0.14)	4.55 (0.14)	2.53 (0.13)	2.77 (0.14)	4.65 (0.16)	4.53 (0.23)	3.14 (0.16)	2.78 (0.12)
	Conversation	4.30 (0.14)	4.31 (0.14)	2.37 (0.13)	2.46 (0.14)	4.35 (0.17)	4.11 (0.23)	2.58 (0.17)	2.49 (0.12)
	Group	4.42 (0.14)	**4.67** (0.14)	2.56 (0.13)	2.85 (0.14)	**4.68** (0.17)	4.58 (0.23)	3.06 (0.17)	3.03 (0.12)
	Isolation	**4.74** (0.14)	4.55 (0.14)	2.92 (0.13)	3.02 (0.14)	**4.81** (0.17)	4.37 (0.23)	3.44 (0.17)	2.80 (0.12)
	Others' Viewpoints	4.44 (0.17)	4.35 (0.16)	2.97 (0.15)	2.81 (0.16)	4.30 (0.19)	4.53 (0.27)	**3.47** (0.2)	2.93 (0.14)
ADHD SOD Score	Inattention	2.12 (0.15)	1.86 (0.15)	3.03 (0.14)	2.88 (0.14)	3.49 (0.17)	3.74 (0.24)	1.72 (0.17)	1.67 (0.13)
	Multiple Tasks	3.24 (0.17)	2.78 (0.16)	3.69 (0.15)	3.77 (0.16)	4.14 (0.19)	4.26 (0.27)	2.19 (0.2)	2.13 (0.14)
	Impulsivity	3.08 (0.16)	2.31 (0.15)	3.66 (0.14)	3.56 (0.15)	3.95 (0.18)	4.11 (0.25)	2.92 (0.18)	1.99 (0.13)
	Life Rhythm	3.08 (0.16)	2.20 (0.16)	**4.36** (0.15)	**4.15** (0.16)	4.41 (0.19)	4.32 (0.26)	**3.50** (0.19)	2.23 (0.14)
	Emotional Control	3.26 (0.16)	3.63 (0.16)	4.02 (0.15)	4.12 (0.16)	4.62 (0.19)	4.37 (0.27)	3.00 (0.19)	3.03 (0.14)

※1 Numbers in parentheses are standard deviations

disorders in their background.

It was also suggested that students with high support needs had more difficulties with developmental disorders. This study defined these students as "students who were disciplined for excessive absences and tardiness, expulsion, retention, and student guidance problems, and whose background was thought to be one of stress or other psychological factors." The results suggest that the high level of SOD that was unique to students with developmental disorders, such as ASD and ADHD, may be one of the risk factors for developing such serious problems. However, according to the report of the 2016 survey on the use of the health room (Japan School Health Association, 2018), only 5.4% of *Yogo* teachers cited developmental disorders as a background factor for high school students who used the health room. This indicates that high school *Yogo* teacher teachers do not place as much importance on the perspective of "developmental disorder" as they do on other factors. Considering the results of this study, we believe that supporting students with the perspective of "developmental disorder SOD" as the background of the problems they face may help to prevent the problems from becoming more serious. Furthermore, as shown in Table 3, there were many students with high support needs in the "ASD & ADHD SOD group" whose ASD SOD score and ADHD SOD score were both high, and many students with low support needs in the "Non-ASD & ADHD SOD group" where both scores were low. However, there was no bias in the number of students in the "ASD SOD group" and "ADHD SOD group." Based on these results, it can be inferred that students with both ASD and ADHD SOD tended to be more likely to develop serious problems, such as school maladjustment (truancy, dropouts, etc.) and student guidance disciplinary actions.

The mean scores of each item in the checklist for each group in Table 4 suggest that students in the group with high ASD SOD scores may feel uncomfortable in group activities and isolated in the group. In recent years, improving classes by actively incorporating group activities has been promoted to realize independent, interactive, and deep learning in high schools. This trend may have a considerable influence on their adaptation to school life. This issue needs to be discussed in detail in the future. In addition, it was suggested that many students in the "ADHD SOD group" had high "life rhythm" scores. In addition, there was a large difference in the "life rhythm" scores of the "non-ASD & ADHD SOD group." High school students are at an age when they are more likely to develop

autonomic nervous system problems and sleep disorders (Kametaka et al., 2000; Ikeda et al., 2015); it has been pointed out that many students who are absent have these problems. Furthermore, it has been reported that 25%–50% of ADHD is complicated by sleep disorders (Konofal, Lecendreux, Cortese, 2010); we believe that the results of this study may reflect this reality. In high schools, the number of days absent and tardiness are very strictly regulated as requirements for promotion and graduation; there are many cases in which the disruption of the daily rhythm directly leads to transfer or expulsion from school. It is necessary to examine the student's situation and develop support for them at an early stage in cooperation with medical institutions.

5. Conclusion

As described above, many students with developmental disorder SOD use the health room, and it is suggested that the greater the SOD, the more likely it is to develop into a serious problem. We suggest that the students who come to the health room with mental health problems may be able to prevent these problems from becoming more serious if they are treated from the viewpoint of "developmental disorder SOD." In this way, *Yogo* teachers will be required to recognize the problem as soon as possible and provide appropriate support by connecting students to school counselors and medical institutions in cooperation with teachers and staff.

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