

Original Paper

# Development of the Anger Coping Behaviors Style Scale for High School Students

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## Abstract

The reliability and validity of the Anger Coping Behaviors Style Scale for High School Students were examined in this study. In the analysis, we used the data of senior high school students in A Prefecture (n=3360) who had no missing values on the survey items. We extracted the following four factors using exploratory factor analysis: Support seeking, Situation analysis, Escape, and Violence. Then, we examined the factorial validity of the scale using confirmatory factor analysis, which indicated that an oblique factor model consisting of these four factors fitted the data (CFI: Comparative Fit Index=0.955, RMSEA: Root Mean Square Error of Approximation=0.070). The results of statistical analysis supported the reliability and validity of the Anger Coping Behaviors Style Scale for High School Students developed in this study.

## 1. Introduction

Aggressive behaviors have become prominent and problematic among high school students. Aggressive behaviors for coping with anger, such as violence or self-injury, are negatively related to the well-being of juveniles. Prevention of these behaviors and teaching juveniles better styles for coping with anger are important concerns for health education in schools and juvenile counseling<sup>1,2)</sup>. Aggression in general includes emotional characteristics such as anger and hostility<sup>3)</sup>. Moreover, various emotional problems and behavioral disorders that adversely affect adult lives are often first expressed during adolescence<sup>4)</sup>. For preventive interventions for aggressive behaviors, a support system is essential not only to simply repress anger but also to transform anger into active energy responding to situations<sup>5)</sup>. In order to properly educate high school students and provide support, it is important to accurately understand the characteristics of coping behaviors that accompany anger.

The White Paper on crime 2013 published by the Japan Ministry of Justice indicates that the number

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of juvenile delinquents was in a decreasing trend as of 2013. However, juveniles showed a higher ratio in crime when comparing the number of arrests per 100,000 juveniles aged 10 to 20 years old as compared to adults over 20 years old. In addition, injurious behavior and violence were factors in 9.7% of juvenile arrests. This means that a preventive intervention for anger is urgently needed in schools. Moreover, high school students are reported to have the highest tendency for self-injury and associated school nurse visits<sup>6)</sup>. It is also reported that 99% of school nurses have experience dealing with students who have injured themselves<sup>7)</sup>.

Lazarus and Folkman<sup>8)</sup> defined coping behaviors as "behavioral and cognitive efforts to deal with external and internal demands." Stress responses are determined by cognitive evaluation of external stimuli and coping behaviors, which increase or decrease such responses. It is important to understand the characteristics of coping behaviors that accompany anger in order to provide appropriate education and support to juveniles. Although previous studies have focused on coping behaviors<sup>9,10)</sup> and expression methods<sup>11-13)</sup> for managing anger, few studies have investigated anger coping behaviors among high school students. Furthermore, although studies on self-injury have suggested that anger is one cause of self-harming behaviors<sup>14)</sup>, most anger studies have not taken self-injury, defined as violence towards the self, into consideration. On the other hand, it is pointed out that the Japanese tend to suppress the expression of anger in comparison with the British<sup>15)</sup>. Moreover, it is important to know how Japanese high school students are coping with their anger when providing them health education. Thus, developing a scale to assess anger coping behaviors of high school students is needed.

For the present study, basic information that would be useful for developing preventive interventions targeting maladaptive behaviors used in coping with anger among high school students was gathered. We then developed an Anger Coping Behaviors Style Scale for High School Students, and examined its reliability and validity.

## 2. Methods

### 2.1 Participants

Participants in the present study were students in public senior high schools located in A Prefecture of Japan. Stratified sampling using grade, gender, curriculum, and course of study (general or technical courses) was used, such that "curriculums" and "courses" of participants maintained nearly identical percentages, and demographic characteristics of the population distribution were appropriately reflected in gender and age ratios. The sample was stratified so that 60% were general course students and 40% were technical course students. The general courses included business, technology, home economics, and agricultural courses. For the curriculum, the sample was selected so that the ratio of full-time to part-time students was 9:1. A total of 4,056 students (3,648 full-time and 408 part-time) were selected and asked to participate in the survey study. The response rate of the surveys was 95.1% (3856 responses). Only the surveys that indicated that the respondent's age was between 15 to 18 years old were included. Surveys with incomplete responses, repeated same choices, or at least one invalid answer were eliminated from the analyses. As a result, there were total of 3,360 valid surveys.

### 2.2 Ethical considerations

The present study was conducted with the agreement of the school officials and the parents of the participants. The participants were informed, both in writing and through oral instructions, about the research objectives, content of the survey, procedure, benefits, and potential harms of participating in the survey. The anonymity of the survey participants' responses was guaranteed. Furthermore, we explained that the collected responses would not be used for purposes other than the current study, and the participants had the right to withdraw from the research study at any point during the study with no disadvantage for them. The participants provided informed consent by turning in the survey. The data and analyses were handled in an environment without internet access. The institutional review board at the

Tamano Institute of Health and Human Sciences approved the present study.

### *2.3 Data collection period*

The survey was conducted from April 9, 2014 to April 25, 2014 by administering the survey during classes, homerooms, and health checkups at the high schools. All the surveys were conducted within two weeks of the beginning of the school semester.

### *2.4 Operational definitions*

In the present study, anger was defined as a "vigorous and uncontrollable condition caused by unreasonable or deliberate self-defense mechanisms or psychophysiological alerts that are provoked for social maintenance in response to physical or psychological violations to the self or society."<sup>16)</sup> Coping was defined as "continuous cognitive and behavioral efforts to manage specific external and internal desires that exceed or overload the individual's resources."<sup>8)</sup>

Based on the above, in this study, we defined anger coping behaviors as "cognitive and behavioral efforts to cope with uncontrollably strong anger."

### *2.5 Survey*

The survey consisted of questions about demographics, such as gender, age, grade, and course, and 29 questions about anger coping behavior styles. First, question items expressing behaviors for coping with uncontrollably strong anger were developed based on a prior qualitative study<sup>17,18)</sup>. Each item included concrete and specific content, and we used expressions that could be easily understood by respondents. Next, professionals, including high school teachers (n=3) with 10-15 years of teaching experience in charge of student consulting, as well as university teachers specializing in stress related research (n=3) examined the content validity of the scale. The subscales developed through the above process, as well as each question item were examined for content validity, clarity of expressions, and ease of responding, among others. Expressions in the question items were modified based on the results. Lastly, a pilot study was conducted with high school students (n=30) using the scale that was modified by discussions among professionals. Participants responded by using a five-point scale: 4 (very often), 3 (often), 2 (sometimes), 1 (seldom), and 0 (never). Then, the expressions were further modified by taking the opinions expressed in the free description section into consideration.

### *2.6 Statistical analysis*

First, an exploratory factor analysis was conducted based on question items about anger coping behaviors. Prior to the exploratory factor analysis, polychoric correlation coefficients of the 29 survey questions were calculated in order to eliminate items with high redundancy. We eliminated one of the items if the paired items had correlation coefficients larger than 0.9. After the elimination, using the remaining items, factor extraction was performed using a promax rotation. Based on the differences in the eigenvalue, the model fit index, and factor loadings, decisions were made about the number of factors and to which factor each item belonged. We referred to the root mean square error of approximation (RMSEA)<sup>19)</sup> for the model fit index. For factor loading, items included in more than two factors with larger than a 0.4 loading value were excluded. In addition, items that did not load on any factors with less than 0.4 were eliminated. Moreover, factor loading was calculated using the weighted least square mean and variance (WLSMV<sup>† 1)</sup>)<sup>20)</sup>, which compensates for standard error by adjusting to the data distribution and treats it as a categorical value. Results of exploratory factor analysis suggested an oblique model consisting of the four factors that were extracted based on the factorial validity of the Anger Coping Behaviors Style Scale. Moreover, confirmatory factor analysis examined the fitness of the factor structure. The model fit was determined using the comparative fit index (CFI)<sup>21)</sup> and RMSEA, and the likelihood was determined with WLSMV. Moreover, the concepts of the four factors were examined by taking the convenience of using them into

consideration. Reliability of the scale was examined using the coefficient  $\omega$ . For all the statistical analyses, Mplus7.2, HAD14.801 was used.

### 3. Results

#### 3.1 Demographic distribution: Curriculum, course, gender, and class distribution.

The survey respondents included 1,562 men (46.5%) and 1,798 women (53.5%). Of these, 1,617 (48.1%) students were enrolled in the general course, and 1,743 students (51.9%) were in the technical course. Regarding the curriculum, 3,095 students (92.1%) were full-time and 265 students (7.9%) were enrolled part-time. In terms of the school grade level, 1,188 students (35.4%) were first year students, 1,201 students (35.7%) were in second year students, and 971 students (28.9%) were third year students. The age of the students was 15 years old 1,176 (30.0%), 16 years old 1,202 (35.8%), 17 years old 974 (29.0 %), and 18 years old (29.0%).

#### 3.2 Developing the model of the factors of coping with anger

Table 1 shows the responses by distribution of the survey responses about anger coping behavior of high school students. The calculation of the polychoric correlation coefficients of the 29 items revealed that there were no paired items with correlation coefficients larger than 0.9. Thus, we conducted the exploratory factor analysis by using all 29 items, and four factors were extracted. At the same time, five items (xa11, xa25, xa26, xa28 and xa29) did not yield factor loadings larger than 0.4 for any factors (see Table 2).

Using the obtained data, we interpreted the four factors as distinct anger coping styles. Factor I included 5 items such as xa3: "I talk with people such as friends and family, who can share my feelings", xa4: "I talk about my situation with others". Factor I was interpreted as Support seeking. Factor II included 6 items such as xa7: "I try to look at my situation objectively" and xa8: "I try to think about the meaning of my increasing anger". Factor II was interpreted as Situation analysis. Factor III included 8 items such as xa19: "I use violence on others" and xa24: "I stab my skin with sharp things such as mechanical pencils". Factor III was defined as Violence. Factor IV included 5 items such as xa12: "I try to act cheerful as opposed to expressing my real feelings" and xa15: "I try not to think about anything". Factor IV was interpreted as Escape. Thus the analysis of the questionnaire data yielded four factors corresponding to the styles for coping with anger: Support seeking; Situation analysis; Violence; Escape.

We aimed to develop a convenient assessment scale that directly reflected factors extracted through exploratory factor analysis as described above. The scale included four superior items (Factor I : Support seeking, Factor II : Situation analysis, Factor III : Escape, Factor IV : Violence) with a factor loading larger than 0.4, which was named "Anger Coping Behaviors Style Scale for High School Students."

The oblique model consisting of the 16 items belonging to the top four items of each factor showed the fit model of CFI 0.955, and 0.070 of RMSEA (Fig. 1). Furthermore, the coefficient  $\omega$  for each factor in the Anger Coping Behaviors Style Scale for High School Students was 0.852 for Support Seeking, 0.767 for Situation Analysis, 0.685 for Violence, and 0.651 for Escape.

### 4. Discussion

The present study was conducted to develop a scale to assess anger coping behavioral styles among high school students and to examine the reliability and validity of the developed scale. In developing the scale, we focused on the style of anger coping behaviors with a view toward eventually developing preventive interventions for improving the behavior of high school students in dealing with anger.

As a result, the exploratory factor analysis conducted in the present study enabled us to extract four factors representing distinct anger coping styles: Support seeking, Situation analysis, Violence, and Escape. The oblique model consisting of 16 items within the four factors fit the data well. This means that the resultant Anger Coping Behaviors Style Scale for High School Students had statistically supported factorial validity. Moreover, the reliability coefficients for each factor, the coefficient  $\omega$  as an index for internal consistency, fell in the acceptable range.

Table 1 Distribution of the survey responses about anger coping styles of high school students (n=3360)

Item	Item content	Answer categories					Unit : n (%)
		Never	Seldom	Sometimes	Often	Very often	
xa1	I seek help from others	868 ( 25.8 )	930 ( 27.7 )	1158 ( 34.5 )	231 ( 6.9 )	173 ( 5.1 )	
xa2	I seek advice from others with similar experiences	1001 ( 29.8 )	838 ( 24.9 )	1073 ( 31.9 )	264 ( 7.9 )	184 ( 5.5 )	
xa3	I talk with people such as friends and family, who can share my feelings	600 ( 17.9 )	565 ( 16.8 )	1118 ( 33.3 )	524 ( 15.6 )	553 ( 16.5 )	
xa4	I talk about my situation with others	598 ( 17.8 )	706 ( 21.0 )	1258 ( 37.4 )	444 ( 13.2 )	354 ( 10.5 )	
xa5	I try to accept my situation	293 ( 8.7 )	514 ( 15.3 )	1497 ( 44.6 )	627 ( 18.7 )	429 ( 12.8 )	
xa6	I discuss the problem with related people or persons	804 ( 23.9 )	1012 ( 30.1 )	990 ( 29.5 )	333 ( 9.9 )	221 ( 6.6 )	
xa7	I try to look at my situation objectively	538 ( 16.0 )	801 ( 23.8 )	1278 ( 38.0 )	430 ( 12.8 )	313 ( 9.3 )	
xa8	I try to think about the meaning of my rising anger	542 ( 16.1 )	653 ( 19.4 )	1152 ( 34.3 )	609 ( 18.1 )	405 ( 12.1 )	
xa9	I try to think of a solution that I can use right now	280 ( 8.3 )	444 ( 13.2 )	1277 ( 38.0 )	798 ( 23.8 )	561 ( 16.7 )	
xa10	I try to think of other similar situations	812 ( 24.2 )	1002 ( 29.8 )	1018 ( 30.3 )	323 ( 9.6 )	205 ( 6.1 )	
xa11	I try to believe that it is not happening to me	1581 ( 47.1 )	1064 ( 31.7 )	579 ( 17.2 )	77 ( 2.3 )	59 ( 1.8 )	
xa12	I try to act cheerful as opposed to expressing my real feelings	611 ( 18.2 )	635 ( 18.9 )	1098 ( 32.7 )	524 ( 15.6 )	492 ( 14.6 )	
xa13	I calm my anger by thinking about something else	535 ( 15.9 )	642 ( 19.1 )	1182 ( 35.2 )	544 ( 16.2 )	457 ( 13.6 )	
xa14	I blame myself	679 ( 20.2 )	828 ( 24.6 )	1091 ( 32.5 )	405 ( 12.1 )	357 ( 10.6 )	
xa15	I try not to think about anything	613 ( 18.2 )	692 ( 20.6 )	1107 ( 32.9 )	476 ( 14.2 )	472 ( 14.0 )	
xa16	I terminate the object of anger within myself	791 ( 23.5 )	850 ( 25.3 )	1086 ( 32.3 )	322 ( 9.6 )	311 ( 9.3 )	
xa17	I express my anger and complain to others	1029 ( 30.6 )	1000 ( 29.8 )	871 ( 25.9 )	284 ( 8.5 )	176 ( 5.2 )	
xa18	I hit things (not destroy)	1217 ( 36.2 )	765 ( 22.8 )	790 ( 23.5 )	304 ( 9.0 )	284 ( 8.5 )	
xa19	I use violence on others	2256 ( 67.1 )	683 ( 20.3 )	294 ( 8.8 )	66 ( 2.0 )	61 ( 1.8 )	
xa20	I break public property or other people's belongings	2596 ( 77.3 )	534 ( 15.9 )	154 ( 4.6 )	38 ( 1.1 )	38 ( 1.1 )	
xa21	I ignore people who make me angry	1252 ( 37.3 )	911 ( 27.1 )	737 ( 21.9 )	219 ( 6.5 )	241 ( 7.2 )	
xa22	I pull my hair or skin	2355 ( 70.1 )	454 ( 13.5 )	319 ( 9.5 )	129 ( 3.8 )	103 ( 3.1 )	
xa23	I punch my body or walls	2408 ( 71.7 )	444 ( 13.2 )	298 ( 8.9 )	94 ( 2.8 )	116 ( 3.5 )	
xa24	I stab my skin with sharp things such as mechanical pencils	2876 ( 85.6 )	270 ( 8.0 )	131 ( 3.9 )	39 ( 1.2 )	44 ( 1.3 )	
xa25	I binge eat	2088 ( 62.1 )	626 ( 18.6 )	406 ( 12.1 )	133 ( 4.0 )	107 ( 3.2 )	
xa26	I move my body such as doing sports or taking a walk	931 ( 27.7 )	702 ( 20.9 )	886 ( 26.4 )	388 ( 11.5 )	453 ( 13.5 )	
xa27	I spend time with someone that I am close to friend	500 ( 14.9 )	459 ( 13.7 )	1011 ( 30.1 )	732 ( 21.8 )	658 ( 19.6 )	
xa28	I cry	1195 ( 35.6 )	773 ( 23.0 )	655 ( 19.5 )	364 ( 10.8 )	373 ( 11.1 )	
xa29	I take a deep breath	911 ( 27.1 )	812 ( 24.2 )	895 ( 26.6 )	382 ( 11.4 )	360 ( 10.7 )	

Table 2 Results of exploratory factor analysis (n=3360)

Factor name	Item	Factor and loading			
		1	2	3	4
Support seeking	xa3	0.897	-0.048	-0.143	-0.034
	xa4	0.852	-0.002	-0.058	-0.073
	xa1	0.782	-0.022	0.000	0.024
	xa2	0.744	0.086	-0.013	0.031
	xa27(delete)	0.425	0.152	-0.160	0.102
Situation analysis	xa9	-0.046	0.771	-0.052	0.040
	xa8	-0.115	0.768	0.078	0.043
	xa7	-0.131	0.699	0.025	0.061
	xa10	0.084	0.589	0.099	0.102
	xa5(delete)	0.146	0.549	-0.066	0.018
	xa6(delete)	0.220	0.491	0.107	-0.151
Violence	xa20	-0.049	0.149	0.919	-0.252
	xa19	-0.041	0.143	0.853	-0.326
	xa23	-0.137	-0.083	0.726	0.198
	xa24	-0.167	-0.036	0.675	0.320
	xa18(delete)	0.116	-0.125	0.639	-0.035
	xa22(delete)	-0.128	-0.064	0.602	0.325
	xa21(delete)	-0.031	0.035	0.542	-0.140
	xa17(delete)	0.377	-0.142	0.480	-0.077
Escape	xa15	-0.014	-0.088	-0.104	0.678
	xa16	-0.054	0.057	-0.096	0.618
	xa13	-0.044	0.118	-0.126	0.601
	xa12	0.003	0.111	-0.048	0.463
	xa14(delete)	0.061	0.122	0.112	0.415
xa11(delete)	0.115	0.151	0.213	0.279	
xa25(delete)	0.148	-0.088	0.370	0.229	
xa26(delete)	0.109	0.218	0.024	0.053	
xa28(delete)	0.304	-0.065	0.170	0.239	
xa29(delete)	0.105	0.291	-0.005	0.233	
% of variance		20.3	15.5	8.3	5.9
RMSEA	0.075				
Correlations between factors		1.000			
		0.462	1.000		
		0.094	-0.087	1.000	
		0.278	0.363	0.196	1.000

■ : The questions, (observation variables), belonging to each of the four factors are shown, starting with those with higher factor load.

□ : The top four items of each factor are shown.

Root Mean Square Error of Approximation (RMSEA)

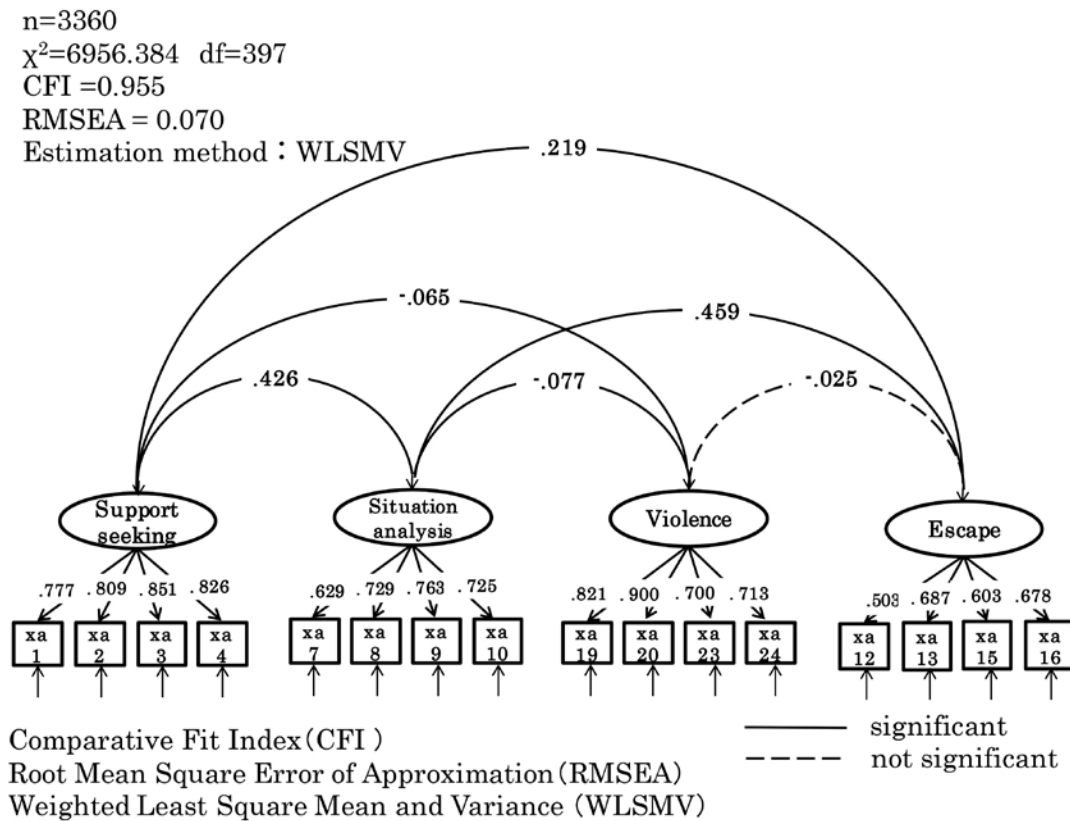


Fig. 1 Confirmatory factor analysis result of Anger Coping Behaviors Style Scale for High School Students

Anger, which we focused on in the present study, is a negative feeling related to aggression which occurs in daily lives, and the regulation of angry feelings is important. Anger leads to deterioration in relationships<sup>22)</sup>, and it could also be a risk factor for depression<sup>23)</sup>. Lazarus and Folkman defined coping as "behavioral and cognitive efforts to deal with external and internal demands."<sup>8)</sup> Two categories were defined within coping: emotion-focused strategies, and problem-focused strategies<sup>8)</sup>. Emotion-focused coping strategies are behavioral strategies to decrease and calm emotions arising in stressful situations. Problem-focused strategies are strategies to solve the problem itself within stressful situations.

The factors included in the scale developed in the present study are in line with Lazarus's theory of coping<sup>8)</sup>. In other words, the 16 items selected for the four factors, which are Support seeking, Situation analysis, Violence and Escape, constitute subcategories of the developed scale and it can be assumed that these items include the two categories of coping. In addition, Connor stated "there are two types of aggression; aggression towards others and aggression towards self."<sup>22)</sup> In particular, Agnew in his "general strain" theory supported Lazarus and Folkman's theory of stress, and defined harmful behavior to others as delinquent coping where unpleasant emotions trigger delinquent behavior<sup>24)</sup>. Self-hurting behavior differs from hurting others, where "compensating for one's anger by means of active self-hurting behavior so that one would not passively blow out anger in a situation where one could easily get angry."<sup>17)</sup> Moreover, research with juveniles in detention homes or reformatories<sup>25)</sup> and inpatients in child psychiatric units<sup>26)</sup> suggested that self-injurious and violent behaviors towards others could coexist. Therefore, the violence factor extracted in the present study supports the coping styles described in the theory.

The present study provided statistical support for the validity and reliability of the Anger Coping Behaviors Style Scale for High School Students. In the future, examination of the screening use of the scale is necessary, such as investigating anger coping behaviors among high school students using the developed

scale and targeting interventions and preventive applications for psychological and physiological health problems that arise among students in coping with anger.

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<sup>†1)</sup>WLSMV is a method for estimating categorical data. It enables us to stably calculate correct estimation values by compensating for standard errors by adjusting to data distribution, regardless of the sample size, the number of observed variables, or normality of latent variables.

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