

Development of a scale on beliefs about negative emotions for Japanese young adolescents

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Abstract: Emotion beliefs include two fundamental attitudes, emotion goodness and emotion controllability, which are crucial to emotion management. However, no existing scale assesses young adolescents' beliefs about emotion. This study involved the development of a scale to evaluate young adolescents' emotion beliefs about anger, sadness, and anxiety, and examined its psychometric properties. Two surveys with 1,352 young adolescents were conducted. The first cross-sectional survey examined the descriptive statistics, structural validity, internal consistency and of the scale scores. Confirmatory factor analysis results indicated the acceptable model fit of the new scale based on its one high-order and three-subfactor structure, CFI = .90; RMSEA = .11; SRMR = .07. The results also demonstrated good internal consistency. The second short-term longitudinal survey evaluated test-retest reliability and construct validity. It demonstrated moderate test-retest reliability values. The evaluation of construct validity revealed moderate positive correlations between each subscale of the developed scale and depressive mood and experiential avoidance, as hypothesized, along with weak positive correlations with diminished activity and psychosomatic complaints. This scale can help assess young adolescents' beliefs about negative emotions.

Keywords: emotion beliefs, beliefs about negative emotions, young adolescents, reliability, validity

Introduction

People hold beliefs about their emotions (hereafter, emotion beliefs; Ford & Gross, 2019), including two fundamental beliefs: whether emotions are (1) good/bad (hereafter, emotion beliefs about goodness) and (2) controllable/uncontrollable (hereafter, emotion beliefs about controllability) (Ford & Gross, 2019). Theoretically, the former concept guides emotion regulation trajectory and the

latter guides its occurrence (Ford & Gross, 2019). According to the extended process model of emotion regulation (Gross, 2015), emotions include evaluations (i.e., defining an emotion as “good for me” versus “bad for me”) (Gross, 2015). Thus, believing that an emotion is bad may strengthen the belief that it requires regulation. Conversely, believing that emotions are uncontrollable may hinder their regulation (Ford & Gross, 2019).

Studies show that emotion beliefs

can predict psychological outcomes. For example, people who believe that emotions are bad show heightened negative emotional responses to stressors (Ford et al., 2018), leading to lower well-being and greater depressive and anxiety symptoms in the long term (Ford et al., 2018; Karnaze & Levine, 2018). Several psychological scales for assessing emotion beliefs have already been developed (Okumura, 2008; Veilleux et al., 2015; Tamir et al., 2007), including the Beliefs about Emotions Scale (BES; Rimes & Chalder, 2010) for adult populations. However, some scales do not categorize or identify specific emotions (e.g., Rimes & Chalder, 2010), whereas, some primarily measure beliefs about controllability (e.g., Tamir et al., 2007; Veilleux et al., 2015). Overall, they do not measure emotion beliefs about goodness, although Okumura's (2008) scale assesses beliefs about the goodness of anger and sadness within a Japanese population, as defined by Ford & Gross (2019). During adolescence, emotional experiences change significantly (Maciejewski et al., 2017); moreover, adolescence is a risk period for the onset of anxiety and depressive disorders (Kessler et al., 2005), which are linked to emotion regulation disruption (Young et al., 2019). Therefore, research on emotion beliefs in young adolescents may provide new insights into the relationship between emotion regulation and psychopathology.

We aimed to develop and evaluate a new scale for Japanese young adolescents that measures beliefs about goodness concerning anger, sadness, and anxiety, which are considered negative emotions experienced regularly by adolescents (Maciejewski et al., 2017). Concepts similar to emotion beliefs and emotion regulation include emotional intelligence (Salovey & Mayer, 1990) and emotional competence (Saarni, 1999). Both

components capture an important aspect of emotion management. The former focuses on the emotion regulation process and the latter on the consequences of individual differences in emotion regulation on social, health, educational, and work outcomes (Peña-Sarrionandia et al., 2015). Emotional competence comprises multidimensional emotion management skills, such as emotional awareness, understanding others' emotions, emotion expression, communication, and emotional self-efficacy. Emotion beliefs, especially "emotion beliefs about goodness," have not been explained and measured in any of the concepts, but are positioned in Ford & Gross's (2019) new emotion regulation model framework. While emotion regulation, emotional intelligence, and emotional competence are superordinate concepts that explain the perception, understanding, and processing of emotions, emotion beliefs are among the factors of emotion management and one of the subordinate concepts.

To the best of our knowledge, no existing scale assesses young adolescents' emotion beliefs about goodness. We examined the psychometric properties of the new scale, such as the structural validity, reliability (internal consistency and test-retest reliability) and construct validity. First, emotion beliefs are likely to influence emotion regulation success or failure (Ford & Gross, 2019), with such failure being implicated in adolescent depressive and anxiety symptoms (e.g., Schäfer et al., 2017). Further, childhood and adolescent depression is likely to co-occur with somatic symptoms (Amendola et al., 2021), that is, physical manifestations of psychological symptoms including fatigue, sleep disturbance, headache, and abdominal pain (Hiller et al., 2006). Such symptoms are related to early childhood

self-regulation and emotional language difficulties to process severe or ongoing stress (Malas et al., 2017). Although the direct relationship between emotional beliefs and somatic symptoms remains unclear, a relationship between impaired emotional regulation and somatic symptoms is apparent (Güney et al., 2019). Previous research on adults' emotion beliefs about controllability shows the relationship between emotion beliefs and depressive tendencies to be $\beta = .15-.27$ (De Castella et al., 2013) and $r = .34-.37$ (De Castella et al., 2018). Therefore, it is assumed that there will be an association of $r = .20-.30$ between the new scale, depressive tendencies, and somatic symptoms. Furthermore, young adolescents who believe that emotions are bad may struggle to manage them, leading to regulatory efforts to avoid emotion-provoking experiences considered unpleasant or undesirable (Dennis & Halberstadt, 2013; Tamir & Ford, 2012). In turn, this may result in the exacerbation of experiential avoidance, including maladaptive coping styles and avoidance attitudes toward negative thoughts, emotions, and sensations (Hayes et al., 2004). De Castella et al. (2018) examined the relationship between emotion beliefs about controllability and cognitive and behavioral avoidance among adults, and reported an $r = .28-.39$ relationship between the two. Thus, we expect the relationship between the new scale and experiential avoidance to be about $r = .30$.

Methods

Participants and procedure

Participants included 1,352 Japanese junior high school students (aged 12–15 years, $M=13.86$ years, $SD=.90$) for two

surveys. The first survey, conducted between January and February 2010, included 463 students (231 boys) from three junior high schools in Kanto, Japan, and examined the descriptive statistics, structural validity, and internal consistency of the new scale's scores. The second survey was a short-term longitudinal survey conducted over a two-week interval (Time 1/Time 2) between May and July 2014 to evaluate test-retest reliability. We analyzed Time 1 data of the second survey to assess construct validity. Students from two junior high schools in Chubu, Japan, participated (889 participants; 410 boys, aged 12–15 years, $M=13.15$ years, $SD=.92$). Incomplete data were excluded.

Teachers distributed and collected the questionnaires at the schools. We shared an information sheet and informed consent details on the questionnaire cover page. To ensure that students' non-participation would be unnoticed by others, we included a free space at the end of the questionnaire, on which those choosing not to participate could answer a question unrelated to the survey (e.g., "What have you enjoyed doing recently?"). Further, we assured them that their responses would remain confidential and not influence their grades. We obtained participants' attendance numbers to assess the test-retest reliability and clarified that the numbers would not be used to identify individuals. Only the authors had access to the study data.

Measures

Beliefs about Negative Emotions Scale (BNES). The BNES includes three subscales: anger (BNES-Ag), sadness (BNES-S), and anxiety (BNES-Ax). The instructional texts for each subscale were as follows; Anger: "People call the feelings of losing your temper and getting irritated,

annoyed, and angry ‘anger.’ Please think about this feeling.” Sadness: “People call the feelings of being depressed, sad, or feeling like you want to cry ‘sadness.’ Please think about this feeling.” Anxiety: “People call the feeling of being nervous, agitated, or having a pounding heart ‘anxiety.’ Please think about this feeling.” Each includes six items measured on a four-point scale (4=very much applies, 3=mostly applies, 2=does not really apply, and 1=never applies), based on Okamura (2008). We reviewed the items to reflect Ford & Gross’s (2019) ideas regarding emotion beliefs: an emotion being good/bad, desirable/undesirable, useful/useless, and helpful/harmful. We discussed the items’ age-appropriateness, consistency with the study purpose, simplicity, expression, and understandability, as well as minimizing their number with three teachers from the junior high schools in the first survey until a consensus was reached. The sum of all six items is calculated; higher scores correspond to a higher tendency to evaluate one’s own emotions negatively.

Recent theories (e.g., Barrett & Russell, 2014) argue for rejecting the distinction between emotion types; however, emotion facets (e.g., dysregulation and coping) and type predict maladaptive conditions (Folk et al., 2014). Additionally, people with high levels of negative emotional differentiation experience increased spontaneous emotional regulation (Wang et al., 2020), and emotion differentiation was associated with depressive symptoms (Willroth et al., 2020). Therefore, we viewed each type of negative emotion separately to obtain clinically useful information.

For the BNES’s factor structure, we hypothesized three factors for beliefs about anger, sadness, and anxiety, and one higher-order factor for beliefs about negative emotions, including three negative

emotions. Thus, it is conceivable that one’s negative views about a particular negative emotion may translate to them viewing other negative emotions negatively too (i.e., strong correlations among the three subscales).

Depression Self-Rating Scale for Children (DSRS-C). The DSRS-C includes 18 items measuring depressive tendencies on a three-point scale (0 [*never*] to 2 [*mostly*]) over one week and the Japanese version of the DSRS-C has shown sufficient reliability and validity (Murata et al., 1996). Following the school teachers’ requests during the preliminary discussions, we excluded, “suicide” and “bullying” items as they are sensitive for the students and might cause distress. The 16-item version has already confirmed the factor structure (Sato & Arai, 2002), and some studies have already removed the two items for the same reasons (Ishizu & Ambo, 2007; Shimoda et al., 2017). The 16-item DSRS-C included two subscales: (1) diminished activity/enjoyment and (2) depressive mood. Our sample showed good internal consistency ($\alpha = .89$ and $.80$, respectively). Higher subscale scores indicated higher levels of diminished activity/enjoyment or depressive mood.

Somatic Complaints Scale (SCS). Based on the Psychosomatic Complaints Scale (PCS; Gini, 2008), we prepared the new somatic symptoms scale. The SCS includes six somatic symptoms over the preceding three months: headache, abdominal pain, sleeping problems, feeling tense, feeling tired, and dizziness. However, the SCS is in a checklist format (list of symptoms), thus not suitable for survey-type response. Therefore, we created a written version of these symptoms using the SCS as a reference (e.g., “headache” was modified to “I have a headache.”). Items are evaluated on a five-

point scale (0 [*never*] to 4 [*almost every day*]). Our sample showed good internal consistency ($\alpha = .79$). The sum of all items is calculated; higher scores indicate more somatic complaints.

Short form of the Avoidance and Fusion Questionnaire for Youth (AFQ-Y8). This self-report questionnaire (Greco et al., 2008) measures adolescents' experiential avoidance including maladaptive coping styles and avoidance of negative thoughts, emotions, and sensations. It includes eight items scored on a five-point scale (0 [*not at all true*] to 4 [*very true*]) and has good internal consistency and convergent and construct validity (Greco et al., 2008), as does the Japanese version (Ishizu et al., 2014). Our sample also showed good internal consistency ($\alpha = .85$). The sum of all items is calculated; higher scores correspond to greater experiential avoidance.

Statistical analysis

The confirmatory factor analysis was conducted using Mplus version 8.1 (Muthén & Muthén, 1998–2017) and other analyses were conducted using IBM SPSS Statistics, version 27. We set the alpha level at $p < 0.05$ for statistical analysis, except for the confidence interval of the root mean square error of approximation (RMSEA; at $p < 0.10$).

Descriptive statistics. We calculated mean scores, standard deviations, and skewness/kurtosis statistics for each BNES item using the first survey's data. Each subscale item was within the recommended range (± 2) for skewness and kurtosis (Cameron, 2004).

Factor analysis. Confirmatory factor analysis (CFA) was performed on first-survey data for examining the structural validity of the BNES, and the scale parameter was estimated with the

weighted least squares mean-and variance-adjusted estimator (WLSMV) as it is more suitable for ordered-categorical items with five responses or fewer (e.g., Finney & DiStefano, 2013). The model fit was determined based on the recommendations of Hu & Bentler (1999) using the comparative fit index (CFI) and the RMSEA, and we adopted the standardized root mean square residual (SRMR). Specifically, CFI value of ≥ 0.95 and RMSEA and SRMR values of ≤ 0.05 suggest a good fit of the model to the data, whereas CFI value of 0.90–0.94 and RMSEA and SRMR values of 0.07–0.10 suggest an acceptable fit. For the scale, we included items with factor loadings over .40 on a primary factor, based on the guidelines that meaningful factor loadings generally range from .30 to .40 (Floyd & Widaman, 1995).

Reliability and validity. Cronbach's alphas were calculated using first-survey data. We determined that a Cronbach's α ranging from .70–.80 reflects acceptable reliability, based on a previous review study (Oshio, 2016). We applied the test-retest method and calculated intraclass correlations (ICC) [2, 1] to evaluate time stability using second-survey data collected after a two-week interval. For the ICC criteria, values of .40–.59, of .60–.74, and over .75 were considered fair, good, and excellent, respectively (Cicchetti, 1994). In addition, to evaluate the construct validity of the new scale, Pearson's correlation coefficients for associations among the BNES total scores, subscale scores, and the DSRS-C, SCS, and AFQ-Y8 scores were calculated using second-survey data. For correlation analyses, even if Pearson's correlation values were weak, they could show significance because this study's sample size was large. Therefore, we adopted Cohen's (1988) criteria in which Pearson correlation

values of $r = \pm 0.50$ are considered strong, ± 0.30 , moderate, and ± 0.10 , weak.

Ethical considerations

The Ethics Committee of University of Tsukuba (approval no. 25-146) approved this study. Consent to participate in these surveys was obtained from the respective schools and students. To ensure participant anonymity, we did not seek any personally identifiable information or the use of real names. It was clarified that students could refuse to participate by not answering the questionnaire; questionnaire completion implied consent to participate. Although this study involved minors, the Ethics Committee and the head of each school decided that consent from their legally authorized representatives was not necessary.

Results

Descriptive statistics

After excluding two students with missing data in the first survey, data from 461 students (230 boys, aged 12–15, $M=13.86$ years, $SD=.90$) were analyzed. Table 1 shows the descriptive statistics for each BNES subscale item. Each subscale item was within the recommended range (± 2) for skewness and kurtosis.

Factor analysis

The CFA was performed on 18 items of the BNES using a WLSMV for evaluating the fit of one high-order and three-subfactor model (Figure 1). Covariance lines were drawn between the error terms for item 2, 4, and 6 of each subscale, based on the similarity of the item content. The results showed that each item's factor loadings onto each factor exceeded .40 and the fit indices adopted were acceptable, except for the RMSEA. Moderate to strong positive correlations

Table 1. Descriptive statistics for the three subscales of the BNES

Item	Mean (SD)			Skewness			Kurtosis		
	Ag	S	Ax	Ag	S	Ax	Ag	S	Ax
1. I think it is scary. こわいものだと思います	2.75 (1.00)	2.10 (1.04)	2.68 (1.06)	-.42	.49	-.25	-.85	-.99	-1.16
2. I think it is something I should not show. 表に出してはいけないものだと思います	2.52 (1.00)	1.92 (0.93)	2.04 (0.97)	-.02	.72	.64	-1.05	-.41	-.55
3. I think it is unpleasant. いやなものだと思います	2.68 (1.04)	2.19 (1.09)	2.48 (1.06)	-.23	.41	-.00	-1.10	-1.13	-1.22
4. I think it is something I should not feel. 感じてはいけないものだと思います	1.95 (0.90)	1.69 (0.85)	1.80 (0.85)	.69	1.18	.95	-.31	.71	.32
5. I think it would be good if it is gone. なくなってしまう方がいいと思います	2.11 (1.01)	1.98 (1.06)	2.26 (1.11)	.59	.74	.29	-.73	-.73	-1.27
6. I think it is painful. つらいものだと思います	2.46 (1.03)	2.86 (1.13)	2.57 (1.08)	.03	-.52	-.10	-1.14	-1.13	-1.24

Note. SD, standard deviation; BNES, Beliefs about Negative Emotions Scale; Ag, anger subscale; S, sadness subscale; Ax, anxiety subscale. The results are based on the first survey.

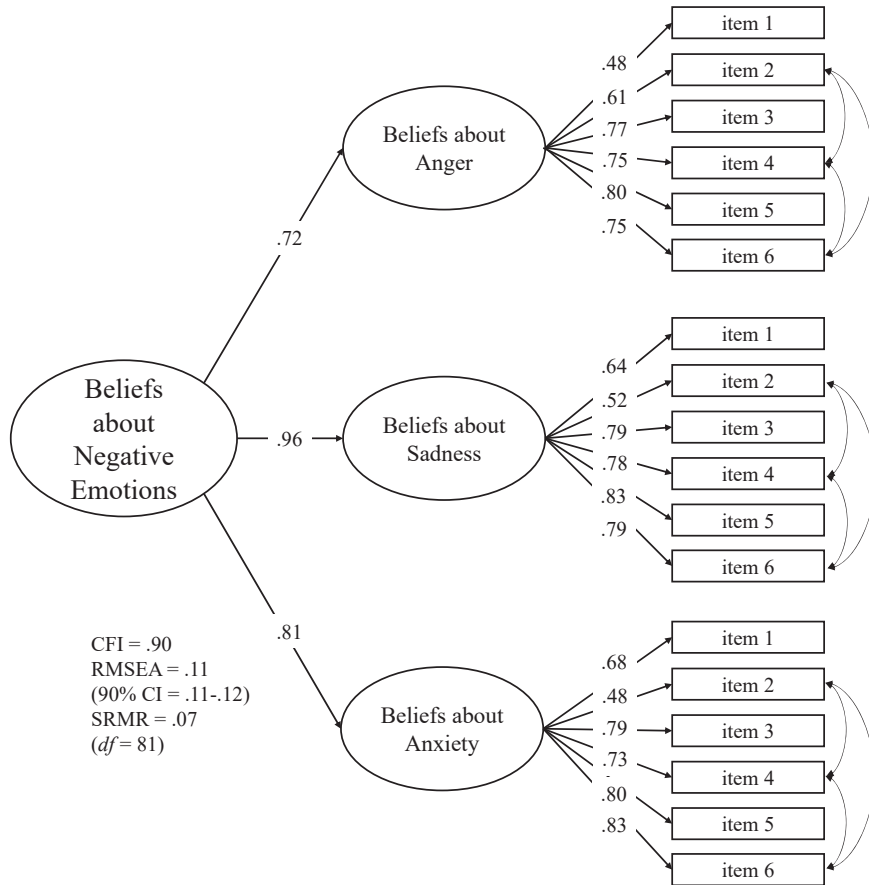


Figure 1. Confirmatory factor analysis model of the BNES

Note. BNES, Beliefs about Negative Emotions Scale; CFI, comparative fit index; RMSEA, root mean square error of approximation; and SRMR, standardized root mean square residual. The results are based on the first survey.

were shown among the subscales; BNES-Ag, BNES-S, and BNES-Ax: $r = .54$ between Ag and S; $.46$ between Ag and Ax; and $.63$ between S and Ax, respectively ($ps < .001$).

Reliability and validity

After excluding 76 students with missing data in the second survey, data from 813 students (354 boys, aged 12–15, $M=13.14$ years, $SD=.93$) were analyzed. All BNES subscales showed Cronbach's α values: $.79$ (BNES-Ag); $.80$ (BNES-S); and $.80$ (BNES-Ax). In addition, the ICCs [2, 1] among the BNES subscales at Time 1 and Time 2 on the second survey data were: BNES-Ag =

$.57$, $p < .001$ and 95% confidence interval (CI) = $.52$ -. 61 ; BNES-S = $.62$, $p < .001$ and 95% CI = $.57$ -. 66 ; and BNES-Ax = $.59$, $p < .001$ and 95% CI = $.55$ -. 63 .

Regarding construct validity, Table 2 shows Pearson's correlations between the BNES subscales and the DSRs-C, SCS, and AFQ-Y8. As hypothesized, each BNES subscale showed almost moderate positive correlations with depressive mood ($r = .27$ -. 31 , $p < .001$) and experiential avoidance ($r = .33$ -. 43 , $p < .001$). However, the BNES showed weak correlations between diminished activity/enjoyment and somatic complaints.

Table 2. Pearson's correlations between BNES subscales and other variables

Item	BNES-Ag	BNES-S	BNES-Ax	BNES-total
DSRS-C-Diminished	.11**	.12**	.15**	.14**
DSRS-C-Mood	.31**	.31**	.27**	.31**
SCS	.19**	.22**	.27**	.26**
AFQ-Y8	.33**	.39**	.42**	.43**

Note. BNES, Beliefs about Negative Emotions; BNES-Ag, anger subscale; BNES-S, sadness subscale; BNES-Ax, anxiety subscale; BNES-total, total score; DSRS-C-Diminished/Mood, Depression Self-Rating Scale for Children-Diminished activity and enjoyment subscale/Depressive mood; SCS, Somatic Complaints Scale; AFQ-Y8, Short form of the Avoidance and Fusion Questionnaire for Youth. The results are based on the second survey.

** $p < .01$.

Discussion

BNES was partially confirmed to have a high-order and three-factor structure, as one model fit index did not meet the criterion. The SRMR met the set criteria, and the CFI almost met the set criteria, but the RMSEA showed results slightly below the set criteria, suggesting that there is room for improvement in the model of this scale. Additionally, they demonstrated good psychometric properties, suggesting that it can evaluate young Japanese adolescents' beliefs about negative emotions. The BNES showed good internal consistency and significant correlations among the BNES subscale scores with no item distortion.

Here, we developed the BNES from the standpoint that negative emotions such as anger, sadness, and anxiety should be considered separately. Additionally, we hypothesized that there would be beliefs about negative emotions in general as a high-order factor, including beliefs about three negative emotions. In fact, the correlations between the three scores of beliefs about anger, sadness, and anxiety were strong, meaning that those who hold negative beliefs about any of the negative emotions are likely to do so for other negative emotions as well. The total score

of the BNES can be regarded as the total score of negative evaluations of negative emotions. However, we were able to clarify the clinical significance of separating negative emotions, thus further studies need to prove this point.

The ICCs for assessing test-retest reliability showed that BNES-Ag and BNES-Ax were fair, while BNES-S was good, based on the set criteria. These results are lower than those generally reported. Oshio (2016) reviewed studies reporting test-retest reliability and noted that test-retest reliability coefficients increase as the number of items increases and that they may decrease as the number of study participants increases. The present study is subject to both these possibilities, possibly explaining the low test-retest reliability observed.

All the BNES subscale scores were correlated with those for the targeted variables, partially demonstrating the construct validity of the scale. Compas et al. (2017) found that maladaptive coping and emotion regulation were related to psychopathological symptoms. Further, emotion beliefs are important for emotion regulation (Ford & Gross, 2019). People who believe that emotions are bad show a heightened negative emotional response

to stressors, depressive/anxiety symptoms, and reduced well-being (Ford et al., 2018; Karnaze & Levine, 2018). Additionally, as we hypothesized, there were moderate positive correlations between viewing emotions negatively and experiential avoidance. Several previous studies on adults (e.g., Dennis & Halberstadt, 2013; Tamir & Ford, 2012) have shown that perceiving emotions as unpleasant/undesirable is related to avoiding experiences that trigger emotions, consistent with this study's results (with young adolescents). Further, avoidance could mediate the relationship between emotion beliefs and depression (Sydenham et al., 2017). According to Sydenham et al. (2017), this indicates that while emotion beliefs do not directly predict depression, they significantly predict depression and anxiety through emotion avoidance. This may also explain the weak association between emotion beliefs and depression in the present study. These associations in young adolescents need to be investigated further.

Emotion beliefs and experiential avoidance require interventions such as cognitive reappraisal related to psychological and physical health (Urry et al., 2009). People who believe emotions are relatively controllable tend to achieve more effective cognitive reappraisal (Veilleux et al., 2015). Moreover, emotion evaluation can affect one's emotion regulation process. If emotion beliefs are considered an important factor that has not received much attention, then future research on emotion beliefs is vital. Further research should also develop a scale that can measure beliefs about controllability in young adolescents to capture a comprehensive view of emotion beliefs.

This study had several limitations. First, our data were old and as it targeted only

junior high school students in specific areas of Japan, a sampling bias is likely, limiting result generalizability. Considering that nearly ten years have passed since this survey was conducted, and that there is room for improvement regarding the goodness of fit of this model as mentioned above, it is necessary to examine whether there are any differences in the emotion beliefs of junior high school students between then and now, and whether the same factor structure can still be confirmed today. Second, emotional problems or mental health diagnoses were not considered, and the scale's suitability for clinical sample application remains unknown. Third, we discussed the contents of the BNES items with several junior high school teachers in advance to develop a scale that junior high school students could easily understand. However, a preliminary survey was necessary to determine their level of understanding of the item expressions. This was not possible owing to scheduling constraints at the school cooperating with the survey. Hence, we were unable to evaluate what the students' actual understanding of the items was. Finally, because we deleted two items of the DSRS-C; bullying and suicide, as did several previous studies in Japan (e.g., Shimoda et al., 2017) for the same ethical considerations, the results of the 16-item version are not directly comparable to the original DSRS-C and require cautious interpretation. In addition, we prepared and used a scale measuring somatic symptoms based on the PCS. However, we did not fully examine the psychometric properties of the scale; thus, we recommend cautious interpretation of the BNES-SCS relationship results.

The BNES showed adequate psychometric properties and could potentially assess

adolescents' emotion beliefs about goodness. The BNES, comprising a small number of items and relatively brief questions, is expected to be easy to implement in surveys or intervention studies with young adolescents. The results of the present study suggest that negative perceptions of negative emotions are associated with depression and experiential avoidance; further investigation is needed to clarify the emotion beliefs of young adolescents and the possibility of supporting them to change their negative beliefs about emotion.

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