

## CULTURAL ADAPTATION AND PSYCHOMETRIC EVALUATION OF THE NORMATIVE BELIEFS ABOUT AGGRESSION SCALE IN BANGLA

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*Key words:* Normative belief, Aggression, Children, Psychometric evaluation, Scripts

### Abstract

With the increased aggressive behavior observed among the children and adolescents in Bangladesh, it is pressing to investigate plausible aggression scripts acquired in childhood that may cause aggressive behavior at a later age. Normative Beliefs about Aggression Scale (NOBAGS) is such a popular tool to identify aggression scripts by measuring children's cognitive dispositions toward aggressive behavior. The current study culturally adapted and psychometrically validated the NOBAGS for elementary school students. After translating all 20 items, it was administered to 210 children (pilot: 30, field study: 180), ages ranging from 10 to 11 years, recruited from two different schools in Dhaka using the convenience sampling method. The Bangla NOBAGS retained all 20 items of the original scale with a latent structure of six correlated components. The Bangla NOBAGS showed satisfactory reliability estimates (Total scale: McDonald's  $\omega_1$  = .96; subscales McDonald's  $\omega_1$ : .68-.90) and validity evidence. The psychometric sound properties of the Bangla NOBAGS suggest the plausible use of this scale to assess elementary school children's perception towards aggressive behavior.

### Introduction

Aggression is an intentional behavior with a potentiality to harm a person or an object in the environment both in physical and psychological manner<sup>(1)</sup>. Aggression encompasses different behaviors such as verbal aggression, bullying, and physical fighting with others<sup>(2)</sup>. The cause of aggression could easily be understood by the information processing model<sup>(3)</sup> that emphasized the life scripts and argued that an acquired aggression script might lead a child to aggressive behavior. This accusation of scripts may happen through the observational and enactive learning process<sup>(3)</sup>. Once the scripts are established, they become resistant to change and may even pave their way into adulthood. Those children may exhibit more aggressiveness who believed that aggression is accepted or appropriate in social situations as an acquired script in childhood<sup>(3)</sup>.

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Adolescent aggression and juvenile crimes led by the act of retaliation and aggression have been a pressing concern. Specifically, Bangladesh is now observing a sharp increase in such crimes<sup>(4)</sup>. Especially there is a prevalence of bullying, physical assault, sexual assault, rape and homicide among this population<sup>(5,6)</sup>. In the first six months of 2020, 1191 adolescents were arrested in 821 cases which included but were not limited to drug abuse, murder and rape cases<sup>(5)</sup>. There are at least 40 reported and identified juvenile crime gangs that are actively engaging in aggressive behavior and showcasing the behavior on different social media<sup>(6)</sup>. This is alarming as aggression can propagate through observation and enactive learning process<sup>(3)</sup>. It is high time we investigated the root of such aggressive behaviors among the adolescents. As we know a person's basic life script is formed during childhood<sup>(7)</sup>, it may be hypothesized that to identify the root of aggressive behavior we need to understand the basic childhood script of an individual. The information processing model also indicated the importance of childhood beliefs about aggression in predicting future aggressive behaviors<sup>(3)</sup>. Apart from the information processing model, there are also additional pieces of evidence that aggressive behavior at an early age may predict the risk of aggression and violent behavior at a later age<sup>(8,9)</sup>. An aggressive pattern of behavior may begin at the school entry age<sup>(10)</sup>. Additionally, it is also evidenced that aggressive behavior among children may lead to depression and anxiety<sup>(11)</sup>. This makes it very essential to investigate the scripts of aggression among children to identify the roots of aggressive behavior and actions based on retaliation. Normative Beliefs about Aggression Scale (NOBAGS) is one of the tools to measure such scripts<sup>(12)</sup>. A more detailed description of NOBAGS is provided in the method section. Normative belief<sup>(13)</sup> is a self-regulating belief system which can be thought of as scripts to influence human behavior. Normative beliefs are at their best cognitive standards about accepting a behavior for an individual<sup>(12)</sup> or an individual's belief frame regarding acceptable or unacceptable behavior specified by a group of people<sup>(14)</sup>. NOBAGS is a very widely used scale to understand the aggression scripts among children in the form of normative beliefs.

However, there is a scant of psychometrically valid measurement tools appropriate for Bangla language and culture to understand the children's aggression scripts. There is no indication that NOBAGS has been used in published research in Bangladesh. Additionally, without proper psychometric evaluation, a measure developed for a given construct in one particular group may not assess the same construct in a well-behaved manner in other groups<sup>(15)</sup>. As such, this study aimed to culturally adapt and psychometrically validate the Bangla NOBAGS scale for elementary school students. The original NOBAGS has two forms (Form A & B) which differ only in whether the item stems are worded "it is ok" or "it is wrong". This research focused on the "Form A" of NOBAGS and culturally adapted and psychometrically validated it by following standard translation guidelines, estimating reliability and gathering evidence for validity.

## Materials and Methods

The requisite sample size for the current study was estimated by the 4: 1 or 5:1 criterion suggested for factor analysis<sup>(16)</sup>. These criteria suggested that at least 80 or 100 (strict criterion) participants should be recruited as there were 20 items on the scale<sup>(16)</sup>. The field sample size (N=180) exceeded the suggested adequate sample size. At first, researchers had chosen two different public schools in Dhaka by convenience sampling techniques. The data collection followed two different phases: pilot and field study phase. First, for the pilot phase, data were collected from 30 students (15 female and 15 male) of class five ( $M_{age} = 10.13 \pm .35$ ) using random sampling method. Second, for the field study after finishing the pilot phase, data were collected from 180 class five students (89 female and 91 male) using random sampling method ( $M_{age} 10.6 \pm 0.23$ ). Before conducting the study, the Institutional Ethics Committee approval was obtained. The demographics are showcased in Table 1.

**Table 1. Demographic characteristics of sample.**

Variables	Pilot Phase		Field Study	
	Pilot Sample (N=30)		Field Study Sample (N=180)	
	M (SD)	Frequency (%)	M (SD)	Frequency (%)
Age	10.13 (.35)		10.06 (.23)	
10		26 (86.7)		170 (94.4)
11		4 (13.3)		10 (5.6)
Gender				
Girls		15 (50)		89 (49.4)
Boys		15 (50)		91 (50.6)
Social Standard				
Low		0		0
Middle		13 (43.3)		73 (40.6)
High		17 (56.7)		106 (58.9)

*The Normative Beliefs about Aggression Scale (NOBAGS)*: The NOBAGS consists of 20 items to measure individuals' cognitive dispositions about the acceptability of aggressive behavior<sup>(12)</sup>. This scale can be implemented on people aged 6-48. NOBAGS produces a total score and sub-scores from two subscales (the general approval of aggression subscale and approval of retaliation subscale with 4 subsets). The approval of retaliation (Item 1-12) subscale measures the perception of how acceptable it is to act in an aggressive manner under different circumstances of provocation. The general approval of aggression (Item 13-20) measures children's general belief regarding the appropriateness of aggression.

The response format of the NOBAGS is a 4-point Likert type scale ranging from “it’s perfectly ok” to “it’s really wrong”. In “Form A” items 1,2,5,6,10,12,14-16, and 20 are framed as “It is ok” and the rest of the items are framed as “It is wrong”. Whereas “Form B” follows a reverse sequence of “Form A” in framing questions. Huesmann and Guerra reported a high-reliability coefficient for the subscales ranging between .65-.90<sup>(12)</sup>. A significant correlation between aggressive behavior and the scores obtained in this scale was also reported, which indicated good evidence of validity<sup>(12,17)</sup>.

*Translation of NOBAGS:* To translate and culturally validate the “Form A” of NOBAGS, researchers followed the guidelines of Bartram *et al.*<sup>(18)</sup> (Fig. 1). At first, formal permission from one of the authors of the original NOBAGS<sup>(12)</sup> scale was obtained. Then the construct equivalence of the scale was judged by the authors to ensure a valid cross-cultural application. The authors judged the construct used in the NOBAGS carried the same meaning across Western and Bangladeshi cultures. Upon a rigorous literature review, the authors agreed that the constructs used in NOBAGS are equivalent in terms of meaning in both cultures. Three independent translators (MS in Psychology), two being knowledgeable in cultural and linguistic facets in Bangla and English and the other being a subject matter expert in psychology, translated the English NOBAGS into Bangla (forward translation). Their task was to translate the items based on functional equivalence in a culturally adaptive age-appropriate manner with natural and acceptable language. All three forward translations were then synthesized into one. While synthesizing, the authors carefully judged the functional and semantic equivalence and made required modifications where needed. To increase the precision and equivalence, the synthesized forward version was given to three independent bilingual experts with no knowledge of the original scale for the backward translation (source language: English). The authors again synthesized the backward translation. Finally, the equivalence of the original scale and the forward translation was judged by the authors, and required modification was done where needed. During this rigorous translation procedure, the item response format and rating scales were also closely judged to ensure applicability and equivalence. Through this, the first draft was developed, and the researchers proceeded to the pilot phase.

*Pilot Phase:* A pilot study was conducted on 30 (15 female and 15 male) participants ( $M_{\text{age}} = 10.13 \pm .35$ ) with the first draft of the NOBAGS. The sample size was selected by following the rule of thumb: a minimum sample size of 30 for reliability analysis<sup>(19)</sup>. Before the participation, written consent from the participants was obtained. In this phase, information regarding test instruction, response format, easiness of the language, and clarity of the construct was collected from the small representative group. Additionally, the internal consistency reliability coefficient (Cronbach alpha), and test-retest reliability coefficient (10 days) were also estimated. In the pilot phase researchers

relied on the structure reported on the original scale to estimate the internal consistency reliability<sup>(12)</sup>.

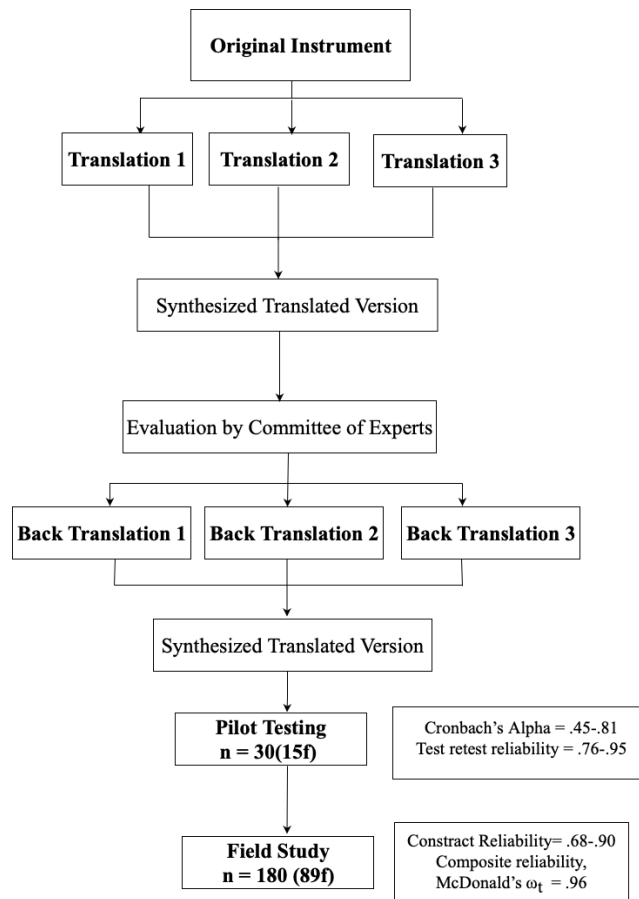


Fig. 1. Adaptation process of NOBAGS.

*Field Study:* Based on the findings of the pilot phase, the 2<sup>nd</sup> draft of NOBAGS was developed and administered to 180 participants (89 female and 91 male). Along with the NOBAGS scale, a demographic questionnaire was used to collect required demographic information. Like the pilot phase, written consent was collected from the participants before their participation.

*Data analysis:* Data were processed using the computer program IBM SPSS, version 27. Prior to any statistical analysis, data were checked for missing values and outliers. For item analysis, inter-item correlations and corrected item-total correlations were assessed. Validity evidence was produced by a principal component analysis with promax (oblique) rotation (structural validity) and average variance statistics (construct validity).

The test-retest reliability was established through the correlational analysis between the scores obtained ten days apart. Internal consistency reliability coefficients were estimated for the total scale score as well as subscale scores.

## Results and Discussion

*Pilot Phase:* The estimated internal consistency alpha coefficient obtained from the pilot phase data was .81 for the total scale and ranged between .45-.83 (Table 2) for the subscales in the sample. In the original scale the total scale internal consistency alpha coefficient was .86, and for subscales it ranged between .69-.82<sup>(12)</sup>. Nevertheless, in the pilot phase, all subscales showed good estimations of test-retest reliability (person product-moment correlation). Test-retest reliability coefficient ranged between .76-.95 for the subscales and for the total scale it was .86 indicating satisfactory stability over two-time points with 10 days intervals. In the pilot phase, the internal consistency appeared lower for the female subsample in comparison to males, and the approval of retaliation against females had the lowest internal consistency for the female subsample ( $\alpha=.38$ ).

**Table 2. Reliabilities of normative beliefs about aggression scale (pilot phase).**

Scale	Items	Internal consistency (Cronbach's Alpha)			Text-retest reliability (10 days)			Internal consistency original scale <sup>(12)</sup>		
		Gender			Gender			Gender		
		Overall N=30	Female n= 15	Male n=15	Overall N=30	Female n= 15	Male n=15	Overall N=1550	Female n= 806	Male n=744
Total approval of aggression	1-20	.81	.80	.86	.95	.96	.96	.86	.86	.86
General approval of aggression	13-20	.64	.41	.83	.76	.78	.73	.80	.79	.80
Approval of retaliation	1-12	.83	.80	.90	.90	.92	.87	.82	.83	.80
Weak provocation	1-8	.82	.72	.89	.90	.89	.90	.75	.76	.74
Strong provocation	9-12	.45	.45	.55	.80	.87	.75	.71	.75	.68
Against males	1-4,9,10	.76	.88	.73	.86	.86	.87	.70	.73	.67
Against females	5-8,11,12	.80	.38	.90	.81	.86	.78	.69	.70	.68

Based on the information acquired in the pilot phase, the authors retained all the items and proceeded to the field study.

*Descriptive Statistics:* Original NOBAGS had 20 items with two subscales. The number of the items for each subscale and the average scores obtained from the field study sample for each item are presented in Table 3. The mean score varied between 1.14-1.93.

**Table 3. The mean and standard deviation of the Bangla NOBAGS (N=180).**

Subscale	Items	M	SD	Subscale	Items	M	SD	
General Approval of aggression	NBA1	1.63	.87	Approval of Retaliation	NBA13	1.46	.80	
	NBA2	1.44	.71		NBA14	1.53	.78	
	NBA3	1.51	.76		NBA15	1.44	.70	
	NBA4	1.30	.51		NBA16	1.42	.74	
	NBA5	1.58	.91		NBA17	1.52	.86	
	NBA6	1.23	.55		NBA18	1.54	.77	
	NBA7	1.49	.74		NBA19	1.71	.99	
	NBA8	1.14	.47		NBA20	1.56	.92	
	NBA9	1.69	.88					
	NBA10	1.62	1.02					
NBA11	1.93	.90						
NBA12	1.29	.67						

*Item Analysis:* Inter-item and corrected item-total correlations were examined (Table 4). Inter-item correlation ranged between .73-.74. The item-total correlation ranged between .41-.80. There was no negative or extremely low item-total correlation.

**Table 4. Summary statistics of inter-item and item-total correlations.**

Correlation	Minimum	Maximum	Mean
Inter-item	.73*	.74 *	.74
Item-total	.42*	.81*	.62

\*Significant at 0.01 level.

Table 5 shows the item-total correlation coefficients and Cronbach's alpha coefficients if item deleted. All item-total correlation coefficients were above .30. The Cronbach's alpha reliability coefficient varied between .88-.90, indicating high reliability of the scale with all the 20 items. Therefore, all items were retained.

*Content Validity:* Content validity assesses the extent to which a particular set of items reflects the construct researchers are interested in measuring<sup>(20)</sup>. The authors checked

whether the constructs were fully defined according to Bangladeshi culture by a rigorous literature review and then judged whether the item contents reflected the defined constructed adequately and specifically.

**Table 5. Value of corrected item-total correlation and Cronbach's Alpha if item deleted.**

Items	Corrected item-total correlation	Cronbach's Alpha if item deleted	Items	Corrected item-total correlation	Cronbach's Alpha if item deleted
NBA1	.57	.89	NBA11	.57	.89
NBA2	.63	.89	NBA12	.31	.90
NBA3	.63	.89	NBA13	.50	.89
NBA4	.55	.89	NBA14	.53	.89
NBA5	.58	.89	NBA15	.35	.90
NBA6	.46	.89	NBA16	.10	.89
NBA7	.70	.89	NBA17	.384	.90
NBA8	.35	.90	NBA18	.498	.89
NBA9	.78	.88	NBA19	.661	.89
NBA10	.50	.88	NBA20	.650	.89

*Structural Evidence:* Principal component analysis was used to identify the internal structure and the relationship among the items. Prior to the principal component analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were estimated. The observed KMO value was .825, indicating a meritorious sample size quality<sup>(21)</sup>. Bartlett's test of sphericity was also significant ( $\chi^2 = 2165.803$ ,  $df = 190$ ,  $p < .01$ ), indicating sufficient correlations among the variables in factor analysis. A principal components extraction<sup>(22)</sup> method with promax rotation with Kaiser normalization was performed on the 20 items of NOBAGS. The Scree test<sup>(23)</sup> and eigenvalue greater than 1 criteria<sup>(24)</sup> were applied to identify component numbers. The scree plot (Fig. 2) was ambiguous with a step inflexion from the first component to the second one, and gradually showing a flattened inflexion pattern until component 7. However, based on the eigenvalue criteria, a six-component solution was accepted, which accounted for 75.347% of the variance. No items yielded communalities less than 0.5 and loaded below 0.30 (Table 6), indicating significant component loadings for each item according to sample size. No item has cross-loading ( $>.40$ )<sup>(25,26)</sup>, indicating the attainment of a simple structure.

In the original scale, there were two subscales: the general approval of aggression subscale (Item 13-20) and the approval of retaliation (Item 1-12). However, in Bangla NOBAGS, the latent structure was composed six components. These components are labeled as "provocation", "acts towards aggression", "emotional state", "aggression against



girl", "beliefs towards aggression" and "approval of aggression". "Aggression against girl" and "approval of aggression" factors had only two items per factor. Nevertheless, for the both factors the estimated internal consistency McDonald's  $\omega_1$  coefficients were satisfactory (.74 and .68, respectively)<sup>(27)</sup>. "Aggression against girl" explained 7.94% of the total variance and "approval of aggression" 5.19% of the total variance. Also, these two factors were highly interpretable. Thus, researchers conferred to retain all the six emerged factors. The correlational nature (Table 7) of the six components also indicated the plausibility of computing a total score by summing all retained item score.

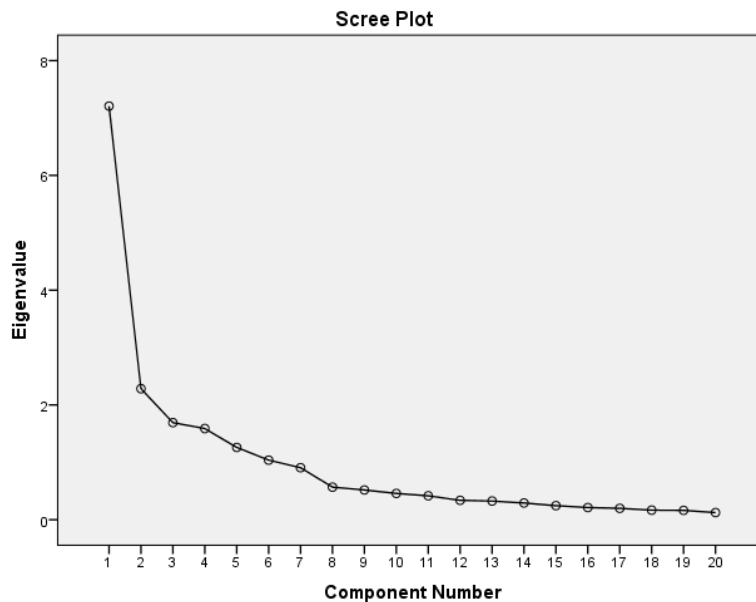


Fig. 2. The scree plot of six factors.

*Construct Validity:* Evidence for the construct validity for the adapted NOBAGS was produced by estimating convergent and discriminant validity<sup>(28)</sup> using the average variance extracted statistics<sup>(29)</sup> (Table 7). The average variance extracted (AVE) is the amount of joint variance captured by the components and not by measurement error. Fornell and Larcker recommended .50 as a benchmark value of AVE to establish the converging validity of a particular tool<sup>(29)</sup>. Only one component, "acts towards aggression," was below this benchmark (component "Acts" = .43), indicating poor convergent validity. This might be caused by the two items (item 9 and 20) with comparatively low loadings (.39 and .47, respectively). Next, authors compared the square root of the AVE value to the correlation coefficient between the components for discriminant validity (Table 7). It was observed that the square root values of AVEs were higher than the correlational coefficients providing good evidence of discriminant validity<sup>(29)</sup>.

**Table 6. Six-component Structure of Bangla adapted NOBAGS (N=180).**

Items	Communi- cality	Provo- cation	Acts towards aggression	Emotional state	Aggression against girl	Beliefs towards aggression	Approval of aggression	M	SD
NBA3	.79	.87						1.51	.76
NBA10	.81	.82						1.62	1.02
NBA7	.90	.80						1.49	0.75
NBA4	.76	.86						1.30	0.51
NBA9	.76		.39					1.69	0.88
NBA1	.80		.83					1.63	0.87
NBA14	.64		.80					1.53	0.78
NBA2	.83		.63					1.44	0.71
NBA11	.59		.68					1.92	0.90
NBA20	.68		.47	.30				1.56	0.92
NBA16	.69			.80				1.42	0.74
NBA18	.79			.76				1.54	0.77
NBA15	.72			.63				1.44	0.70
NBA8	.70				.83			1.14	0.47
NBA6	.66				.71			1.23	0.55
NBA12	.84					.96		1.29	0.67
NBA17	.79					.69		1.52	.085
NBA19	.79					.53		1.71	0.99
NBA13	.86						.87	1.46	0.80
NBA5	.78				.35		.56	1.58	0.90
Variance explained (%)		36	11.42	8.46	7.94	6.3	5.19		
Eigen value		7.2	2.28	1.70	1.59	1.30	1.04		
AVE		.70	.43	.54	.59	.55	.53		
McDonald's $\omega_t$		.90	.81	.78	.74	.78	.68		

*Reliability Estimations:* Cronbach's alpha coefficient, assumes all the factor-loadings of the items under a factor are equal. The obtained structure violated this assumption (Table 6). Also, Cronbach's alpha coefficient doesn't work well with multidimensional scales<sup>(27)</sup>. The principal component analysis indicated a multi-component structure indicating the multidimensionality of the scale. Subsequently, to obtain better estimates of reliability researchers reported internal consistency McDonald's  $\omega_t$  coefficient for each of the components<sup>(27,30)</sup>. Internal consistency reliability ranged between (.68-.90) (Table 6) which were satisfactory. Additionally, reliability for the total scale was also estimated by the McDonald's  $\omega_t$  coefficient<sup>(31-36)</sup>. The McDonald's  $\omega_t$  coefficient for the total scale was .96, which indicated high reliability<sup>(27)</sup> of the adapted NOBAGS. The internal consistency of the Bangla NOBAGS has been quite alike the NOBAGS translated in other languages (Table 8). The high-reliability estimates for the total scale are consistent with the original scale<sup>(12)</sup> and other adaptation work<sup>(37)</sup>.

**Table 7. Validity analysis.**

Components	AVE	Construct reliability	Provocation	Acts towards aggression	Emotional state	Aggression against Girl	Beliefs towards aggression	Approval of aggression
Provocation	.70	.90	<b>.84*</b>					
Acts	.43	.81	.52	<b>.66*</b>				
Emotional state	.54	.78	.18	.30	<b>.73*</b>			
Aggression against Girl	.59	.74	.21	.21	.20	<b>.77*</b>		
Beliefs towards aggression	.55	.78	.38	.26	.20	-.04	<b>.74*</b>	
Approval of aggression	.53	.68	.33	.24	.14	.16	.26	<b>.73*</b>

**Table 8. Internal consistency of NOBAGS.**

Language	Country	Sample	Items	Internal consistency	
				Coefficient	Value
English <sup>(12)</sup>	USA	1550	1-20	Cronbach's $\alpha$	.86
Bangla (This study)	Bangladesh	180	1-20	McDonald's $\omega$	.96
English <sup>(37)</sup>	South Africa	229	1-20	Cronbach's $\alpha$	.84

This study focused on the cultural adaptation and psychometric analysis of NOBAGS. The initial test-retest reliability estimation indicated satisfactory stability of the scale with an interval of 10 days (.76-.95). However, the exploration of the latent structure on the sample revealed a six-component structure. The reliability estimates and validity evidence obtained in the field study indicated the overall sound psychometric properties of Bangla NOBAGS. Nevertheless, there is still room for future possible psychometric analysis. Plausible future directions are: (i) geographically the scope of the data was narrow, data from other parts of the country should be considered to widen the scope, (ii) for further structural validity evidence; a confirmatory factor analysis should be conducted, (iii) efforts should be made to establish measurement invariance with reference to age and gender.

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(Manuscript received on 7 August, 2021; accepted on 20 June, 2022)