

The Factor Structure and Psychometric Properties of the Persian Version of Body Appreciation Scale

Mohammad Atari^{1,*}, Saeed Akbari-Zardkhaneh², Leila Mohammadi¹, Mehrnoosh Soufiabadi¹

¹Department of psychology, University of Tehran, Tehran, Iran

²Department of Psychology, Shahid Beheshti University, Tehran, Iran

*Corresponding author: Atari@ut.ac.ir

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Abstract Previous research has shown that the factor structure of Body Appreciation Scale (BAS) may be different across different cultures. The present study examined the factor structure and psychometric properties of Body Appreciation Scale in a sample of 206 Iranian women. Item analysis, exploratory factor analysis, parallel analysis, and correlational analysis were conducted to evaluate the factor structure, reliability, and validity of the instrument. Exploratory factor analysis suggested a three-factor solution; however, parallel analysis and scree plot suggested a two-factor structure. The two-factor solution had a supporting body of literature in non-Western populations and could be conceptually explained. The internal consistency of the scale was very high ($\alpha=0.94$). Concurrent validity of the scale was assessed by correlational analysis of the related constructs. BAS was significantly correlated with the related variables. Suggestions for future research on the factor structure of the scale are discussed.

Keywords: *body appreciation, body image, validation, psychometrics, factor analysis*

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1. Introduction

The line of research on positive body image has remained relatively limited thus far [1,2] as in past few decades, body image studies have generally focused on pathological sides of this construct. The development and psychometric validation of Body Appreciation Scale (BAS) attempted to overcome this issue in the body image literature [3]. BAS generally measures positive opinions for the body, accepting ideation of the body despite its imperfections, respectful position toward the body, and protection of the body image by rejecting unrealistic ideals from the media. This scale allows researchers to practically move beyond conceptualizing positive body image as the absence of negative views on body [2,4].

Yet, the BAS is required to be examined in various cultural contexts to ensure that its scores are psychometrically sound with people from different cultural backgrounds. Moreover, utilizing a psychometric scale in each culture and across languages requires acceptable psychometric properties. Among Western populations, the BAS has shown a general underlying factor, that is, general body appreciation [3,5,6]. Furthermore, the scale has been illustrated to have satisfactory levels of reliability and validity in Western cultures. Research also suggests that body appreciation scores are significantly associated with acceptance of cosmetic surgery [7], caregiver eating messages [8], intuitive eating [9], and personality characteristics [10].

Though, within non-Western populations, factor-analytic research suggests that the instrument does not reduce to a general single dimension. Swami and Chamorro-Premuzic [11] reported that, in a Malaysian female sample, BAS was better conceptualized as having two subscales. A main factor consisting of eight items was labeled 'General body appreciation'; while a second factor with three items was labeled as an adaptive form of 'Body image investment' (two other items did not load onto factors). Investigations of the Body Appreciation Scale's factor structure among Portuguese-speaking Brazilian [12], Chinese [13], and Korean [14] samples have also supported the solution with two factors. Although in some of aforementioned investigations, the two non-loading items adequately loaded onto the 'general body appreciation' subscale. This line of research indicates that, among non-Western populations, the BAS may be considered as having two distinct factors, one of which taps the concept of body appreciation. Moreover, there remains a discussion relating to the two items and how they load on each factor.

The present study aimed to examine the factor structure and psychometric characteristics of the BAS among Iranian women. The psychometric properties of BAS have not been previously reported in its Persian form. It was expected that the Persian version of BAS would have adequate psychometric characteristics and a factor structure more similar to non-Western societies as present in the literature.

2. Method

2.1. Participants

A sample of 206 female students was recruited from University of Tehran (UT) in capital of Iran. Tehran may be considered as the cultural, economic, and political center of Iran. Participants ranged in age from 18 to 50 years ($M=25.2$ $SD=3.7$) and in BMI from 15.78 to 33.20 ($M=21.7$, $SD=2.9$).

2.2. Measures

2.2.1. Body Appreciation Scale

Respondents filled out the Body Appreciation Scale [3]. All items were rated on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). One item on the scale is gender specific; however, as the target sample consisted of women, the female version was used. Internal consistency of the scale was reported high ($\alpha=0.94$) in the United States [3]. For this study's purposes, the BAS was first translated into Persian (a.k.a. Farsi), the official language of Iran, and then it was back-translated by two independent translators. The differences between the translation and back-translation were settled by agreement between authors and an independent translator.

2.2.2. Life Orientation Test

This 8-item test was developed by Scheier and Carver [15] in order to measure individual differences in generalized optimism versus pessimism. Four items are positively worded and 4 others are negatively worded. Response options are provided in a 4-point Likert-type format. Adequate psychometric properties of the Life Orientation Test (LOT) have been previously reported [16]. Alpha coefficient was 0.61 in this study.

2.2.3. Physical Appearance Comparison Scale-Revised

An 11-item revised scale of physical appearance comparison [17] was used in this study. A 5-point Likert-type response option was provided ranging from "never" to "always". This one-dimensional scale measures the frequency that one compares his/her physical appearance with others in different places. Cronbach's alpha of the Physical Appearance Comparison Scale-Revised (PACS-R) was 0.97 in the present study.

2.2.4. Interest in Aesthetic Rhinoplasty Scale

This 8-item scale was developed by Naraghi and Atari [18] to measure interest in aesthetic rhinoplasty as the most popular cosmetic surgery in Iran [19]. Research suggests that interest in rhinoplasty is associated with psychopathological symptoms [20,21]. Response options were provided in a 4-point scale ranging from "completely disagree" to "completely agree". Interest in Aesthetic Rhinoplasty Scale (IARS) showed high internal consistency in the current study ($\alpha=0.92$).

2.2.5. Demographics

Participants provided their demographic details consisting of age, sex, national T.V viewership, weight, and height. Participants' weight and height were used to compute Body Mass Index (BMI).

2.3. Procedure

Participants were selected using accidental sampling method from university's public locations such as library, dining hall, dormitory, conference room, and classrooms by a research assistant. Verbal informed consent was obtained for each participant and then a paper-and-pencil survey was administered. All data were treated anonymously and confidentially. Moreover, participation in this study was on voluntary grounds and no kind of remuneration was received by participants.

2.4. Statistical Analysis

In order for examining the factor structure of the Persian version of BAS, principal-axis Exploratory Factor Analysis (EFA) using quartimax rotation was utilized as only one factor was expected [22]. Factor retention in EFA was determined by factor eigenvalues above 1.0 (EGV1 procedure), the scree plot criterion [23], and findings from Parallel Analysis (PA). Between-group differences were analyzed by one-way analysis of variance (ANOVA). Finally, bivariate correlation coefficients were computed between BAS scores and concurrent scales. Statistical analyses were carried out by SPSS (22nd version).

3. Results

Table 1. The Persian Body Appreciation Scale's items' descriptive characteristics

Item no.	Item	M	S.D.	S.S.E.	K.S.E.	Corrected ITC	Alpha if item deleted
1	I respect my body	4.12	.790	.169	.337	.589	.892
2	I feel good about my body	3.92	.962	.169	.337	.761	.883
3	On the whole, I am satisfied with my body	4.00	.927	.169	.337	.783	.882
4	Despite its flaws, I accept my body for what it is	3.97	.962	.169	.337	.707	.886
5	I feel that my body has at least some good qualities	4.39	.794	.170	.338	.598	.891
6	I take a positive attitude toward my body	4.16	.888	.170	.338	.815	.881
7	I am attentive to my body's needs	3.80	.980	.169	.337	.627	.890
8	My self-worth is independent of my body shape or weight	4.32	.928	.171	.340	.351	.902
9	I do not focus a lot of energy being concerned with my body shape or weight	3.52	1.107	.170	.339	.095	.917
10	My feelings toward my body are positive, for the most part	4.06	.873	.169	.337	.811	.882
11	I engage in healthy behaviors to take care of my body	3.72	1.056	.170	.338	.619	.890
12	I do not allow unrealistically thin images of women presented in the media to affect my attitudes toward my body	3.97	.995	.169	.337	.536	.894
13	Despite its imperfections, I still like my body	4.29	.840	.169	.337	.717	.886

3.1. Item Analysis

In order to capture initial evidence for descriptive qualities of each item, a broad item analysis was conducted. Mean (M), Standard Deviation (S.D.), Skewness Standard Error (S.S.E.), Kurtosis Standard Error (K.S.E.), corrected Item-Total Correlation (ITC), and alpha-if-item-deleted index were evaluated in this process. Results of the item analysis are presented in Table 1.

3.2. Exploratory factor analysis

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.91 and Bartlett's test of sphericity was significant ($\chi^2(78) = 1627.34, P < 0.001$). Scree plot suggested the extraction of two factors; however, eigenvalues were 6.54, 1.33, and 1.22 respectively. Three factors accounted for 69.81 % of the total variance. Results of the exploratory factor analysis after rotation are presented in Table 2. The first two factors had crossed loadings; however, the third factor (items 8, 9, and 12) was more independently separated.

Table 2. Factor loadings for Persian version of Body Appreciation Scale

Item no.	Factor		
	1	2	3
3	.921		
6	.911		
10	.882		
2	.851		
4	.766		
13	.718		
5	.663		
7	.608	.586	
1	.539	.519	
11	.536	.564	
8			.516
12	.439		.490
9			.364

Table 4. Correlation coefficients between the BAS and its two subscales with related variables

Scale	BMI	Optimism	PACS-R	IARS	Age	T.V.
13-item BAS	-.306**	.334**	-.485**	-.205**	.082	-.065
10-item subscale	-.330**	.358**	-.456**	-.175*	.073	-.063
3-item subscale	-.058	.116	-.329**	-.197**	.085	-.049

** P<0.01

* P<0.05.

4. Discussion

The present study primarily aimed to investigate the psychometric properties and factor structure of the Persian version of Body Appreciation Scale (BAS). Item analysis provided evidence that two items were potentially appropriate for discarding. Items 8 and 9 had the lowest item-total correlation coefficients among all other items. They also had the highest standard error values for kurtosis and skewness. Deletion of these items would have increased the internal consistency of the scale as a one-dimensional instrument.

Exploratory factor analysis was performed to extract underlying factors. EFA with EGV-1 procedure yielded a three-factor solution; however, Scree plot and parallel analysis illustrated that two significant factors may be underlying the scale. The pattern of loadings also made

3.3. Parallel Analysis

Exploratory factor analysis can cause factor over-retention [24]. Therefore, Parallel Analysis (PA) was performed to overcome this issue. In the current study, 1000 random datasets were generated and a Confidence Interval (CI) of 95% was used. Results of the PA are summarized in Table 3.

Table 3. Results of Parallel Analysis on Persian version of Body Appreciation Scale

Component Number	Eigen Value from EFA	Criterion Value from parallel analysis	Decision
1	6.54	1.431	Accept
2	1.33	1.328	Accept
3	1.22	1.243	Reject

3.4. Reliability

The internal consistency of the scale was evaluated using Cronbach's alpha. The alpha coefficients of 13-item and 10-item (excluding items 8, 9, and 12) BAS were 0.898 and 0.924 respectively. The temporal stability of the scale was evaluated in a 4-week period using a subsample of 20 participants. Pearson correlation coefficient between the two administrations was 0.815 ($P < 0.001$) and paired t-test suggested no significant difference between the two times ($t = 0.636, df = 19, P = 0.532$). Consequently, test-retest reliability of the scale was high.

3.5. Correlational Analysis

The Pearson correlation coefficient between 13-item BAS, 10-item subscale, and 3-item subscale (items 8, 9, and 12) and concurrent psychometric tools are presented in Table 4. Furthermore, two subscales (a 3-item subscale and a 10-item subscale) were moderately correlated ($r = 0.39$); meaning that they are conceptually tapping different constructs.

clear that two-factor solution may be conceptually more meaningful because the second factor had crossed loadings with low values on both the first and the second factor; however, the third factor did not show cross-loadings (see Table 2). This model is, again, showing that BAS does not decrease to one underlying factor in non-Western populations such as Iran. Therefore, the Persian version of BAS may be considered as a scale with a two-factor solution.

Considering the two-factor structure of the scale, two extracted subscales had 10 and 3 items respectively. The first subscale's items were consistent with the concept of body appreciation; however, three remaining items were conceptually different. Items 8, 9, and 12 are conceptually not tapping "body appreciation". They may indicate a form of body investment [25]. Therefore, it is highly recommended to discard these three items in body-image research settings among non-Western populations

including Iran. Yet, items 1, 7, and 11 may be considered for re-wording as well.

In order to evaluate the internal consistency of the scale and item-scale characteristics of each item, reliability assessment was performed. BAS was internally consistent in both 10- and 13-item forms. The scale was also temporally stable. The results from Table 1 suggest that exclusion of items 8 and 9 would increase the internal consistency of the scale. The three lowest item-total correlation coefficients belonged to items 9, 8, and 12 respectively. These findings are also consistent with the notion that these items are operationally not tapping the concept of body appreciation and should be discarded for use in future research.

The observed difference in the factor structure of BAS between Western and non-Western populations may root in linguistic differences. Since the factor structure of BAS has been investigated in many non-Western samples with different languages, this explanation does not seem likely. Furthermore, it may basically root in how different cultures consider body appreciation. Perhaps, in Western samples, adaptive forms of body investment or body surveillance are regarded as a part of body appreciation. Yet, the item-factor loadings of these three items, even among American samples [26], are comparatively low in the scale.

Concurrent validity of the scale was assessed using a correlational analysis with related scales. BAS was strongly positively correlated with optimism. Moreover, BAS was negatively associated with interest in aesthetic rhinoplasty as the most prevalent cosmetic surgery in Iran. This finding is consistent with previously reported data, that is, high interest in cosmetic surgery among female undergraduates is strongly negatively correlated with positive body image [7,27]. Furthermore, BAS was negatively linked to physical appearance comparison, that is, those who compare their physical appearance more frequently are less likely to appreciate their body. BAS was also negatively associated with BMI. Therefore, people with higher indices of body mass are less likely to appreciate their body. Though, the score of BAS was not significantly correlated with age and T.V. viewership. In order to further investigate the role of age and media in positive body image, more complex methodology and different psychometric instruments are required which is recommended for future research.

Some limitations of the present study are worth noting. First, the sampling strategy was non-probability which may decrease the representativeness of the sample. Larger samples with probability sampling methods could have increased the external validity of the study. Second, the results of the present study are limited to females as men were not included in the study. Inter-gender differences should be investigated in future research.

5. Conclusion

In sum, the present study showed that the factor structure of BAS was not one-dimensional and consisted of two subscales in Iranian context. This finding was consistent with a large body of literature. The BAS showed high levels of concurrent validity and reliability. Therefore, its 10-item form may be used as a reliable and

valid measure of body appreciation in clinical and research settings in Iran. Though, discarding items 8, 9, and 12 along with rewording/replacing of items 1, 7, and 11 in order to conceptually tap “body appreciation” would potentially improve the factor structure of the BAS in future research.

Note

Persian form of the scale is available upon request from the corresponding author.

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