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Factor Structure and Psychometric Properties of a Romanian Translation of the Body Appreciation Scale-2

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**Abstract**

We examined the psychometric properties of a Romanian translation of the 10-item Body Appreciation Scale-2 (BAS-2). A total of 453 university students from Romania completed the BAS-2, along with measures of disordered eating, self-esteem, satisfaction with life, and subjective happiness. In addition, a separate sample of university students (*N* = 109) completed only the BAS-2 at two time-points three weeks apart. Principal-axis factor analysis indicated that BAS-2 scores had a one-dimensional factor structure in both women and men. Confirmatory factor analysis indicated that this factor structure had adequate fit, but invariance across sex was not supported. Further analyses indicated that BAS-2 scores evidenced internal consistency, convergent validity, and test-retest reliability in both women and men. These results suggest that BAS-2 scores reduce to one dimension in Romanian adults, but the lack of sex invariance may indicate that the same latent construct is not being measured in women and men.

**Keywords:** Body appreciation; Positive body image; Scale translation; Psychometrics; Romania

**Introduction**

 Over the past decade, researchers have given sustained attention to the construct of positive body image, signalling an important shift in the field from a primary focus on pathology to a comprehensive account of the body image concept (e.g., Smolak & Cash, 2011; Tylka, 2012). One particular facet of positive body image that has benefitted from this attention is *body appreciation*, which Tylka and Wood-Barcalow (2015a, p. 53) defined as “accepting, holding favorable opinions toward, and respecting the body, while also rejecting media-promoted appearance ideals as the only form of human beauty.” To measure this facet, Avalos, Tylka, and Wood-Barcalow (2005) developed a 13-item measure, the Body Appreciation Scale (BAS), and its scores were found to have a one-dimensional factor structure in college women in the United States (U.S.). In a later study, Tylka (2013) reported that this one-dimensional factor structure was invariant across U.S. college women and men.

 Studies using factor analysis have supported the one-dimensional nature of BAS scores in a community sample of Austrian adults (Swami, Stieger, Haubner, & Voracek, 2008), Spanish adolescents (Lobera & Rios, 2011), and Turkish college women (Swami, Özgen, Gökçen, & Petrides, 2015; but see Bakalim & Tasleden-Karçkay, 2016). However, in an early study with Malaysian women, Swami and Chamorro-Premuzic (2008) reported, using confirmatory factor analysis (CFA), that the one-dimensional factor structure of BAS scores had poor fit. Using principal-axis factor analysis, these authors instead extracted a two-dimensional structure consisting of a primary factor tapping what they termed “general body appreciation” and a secondary factor that was said to measure “body image investment.” Later studies also supported a two-factor structure of BAS scores across distinct linguistic and national groups (for reviews, see Swami, 2017; Webb, Wood-Barcalow, & Tylka, 2015), including in Brazil (Ferreira, Neves, & Tavares, 2014; Swami et al., 2011), Indonesia (Swami & Jaafar, 2012), South Korea (Swami, Hwang, & Jung, 2012), Poland (Taylor, Szpakowska, & Swami, 2013), Zimbabwe (Swami, Mada, & Tovée, 2012), Hong Kong (Ng, Barron, & Swami, 2015), and Iran (Atari, Akbari-Zardkhaneh, Mohammadi, & Soufiabadi, 2015).

 In addition to these discrepant factor structures, the BAS was also developed prior to sustained focus on the concept of positive body image (e.g., Coppola, Dimler, Letendre, & McHugh, 2017; Holmqvist & Frisén, 2012; McHugh, Coppola, & Sabiston, 2014; Wood-Barcalow, Tylka, & Augustus-Horvath, 2010). In particular, some items of the BAS reflected the antiquated belief that positive body image was equivalent to the absence of indices of negative body image. Given these issues, Tylka and Wood-Barcalow (2015b) developed a revised version of the BAS. Specifically, they deleted one sex-specific item, two items that represent low levels of negative body image, and two items that are inconsistent with current conceptualizations of positive body image (i.e., containing language that assumes bodies are flawed). They developed additional items that would better reflect positive body image and, alongside the eight remaining original items, conducted a factor analysis, in which items were retained that had high factor loadings and low item redundancy. This revised measure, known as the Body Appreciation Scale-2 (BAS-2), consists of 10 items (five original BAS items and five newly developed items), and scores on the scale have been found to have a one-dimensional factor structure in college and community adults from the U.S. (Tylka & Wood-Barcalow, 2015b).

As with the BAS, scholars have also been quick to examine the factor structure of scores derived from translations of the BAS-2. Thus, using principal-axis factor analysis, the one-dimensional factor structure of BAS-2 scores has been supported with college samples from Hong Kong (Swami & Ng, 2015), the Netherlands (Alleva, Martijn, Veldhuis, & Tylka, 2016), and Iran (Atari, 2016), as well as a community sample from Serbia (Jovic, Sfroza, Jovanovic, & Jovic, 2016). In addition, using CFA, the one-dimensional factor structure of the BAS-2 has been confirmed in a mixed college staff-and-student sample from mainland China (Swami, Ng, & Barron, 2016), in a college sample from France (Kertechian & Swami, 2017), and in community samples from Spain (Swami, García, & Barron, 2017) and Poland (Razmus & Razmus, 2017). As in the parent study (Tylka & Wood-Barcalow, 2015b), these CFA-based studies have also reported that BAS-2 scores are invariant across participant sex, evidence internal consistency, and reveal patterns of convergent validity. In addition, most studies with relevant data have reported that men have significantly higher BAS-2 scores than women, with small-to-moderate effect size (*d*s = 0.15-0.58; Atari, 2016; Kertechian & Swami, 2017; Swami & Ng, 2015; Tylka & Wood-Barcalow, 2015), although two studies have failed to find significant sex differences (Swami et al., 2016, 2017). Taken together, the available evidence suggests that BAS-2 scores have a one-dimensional factor structure across cultural groups, with good psychometric properties.

**The Romanian Context**

 Here, we examined the factor structure and psychometric properties of a Romanian (*limba română* or лимба ромынэ in Moldovan Cyrillic) translation of the BAS-2. We believe this is important for several reasons. First, Romanian is spoken by around 24 million people as a first language, mainly in Romania and Moldova (where it has official status), as well as by several million more as a second language (European Commission, 2012). The availability of a translation of the BAS-2 would, therefore, provide an important tool for the assessment of positive body image in relatively neglected linguistic groups within the body image literature. To be sure, a Romanian translation of the BAS appears to have been prepared (Dumitrescu, Zetu, Teslaru, Dogaru, & Dogaru, 2008), but the authors neglected to report on the translational procedures. Just as important, the authors of this translation also did not examine the factor structure of Romanian BAS scores, instead assuming that these scores were one-dimensional. This is problematic because the assumed one-dimensional structure may not be appropriate for these data and may result in spurious associations with other variables.

 Second, investigating body image issues in Romania is important in its own right because of the unique cultural and historical trajectories of its population. For example, it has been suggested that, prior to the adoption of free market economics in Eastern European nations, Communism may have protected women in the region from body image disturbances through a rejection of objectification and a promotion of egalitarianism (Catina & Joja, 2001; Haavio-Mannila & Purhonen, 2001). Although this claim is contested (Eisler, 2001), what is clear is that the introduction of a market economy brought a raft of social and cultural changes (e.g., an influx of Western media emphasising the thin ideal and an ethos of working on the body as necessary) that may have contributed to a rise in body image disturbance in women (e.g., Catina & Joja, 2001; Frederick, Forbes, & Berezovskaya, 2008). Conversely, however, few studies have specifically focused on issues of positive body image in these nations (but see Taylor et al., 2013). In addition, body image research in Romania specifically remains piecemeal and hampered by a lack of psychometrically sound assessment tools, although it is clear that the country is experiencing nutrition and physical activity transitions with increased intake of foods rich in carbohydrates and saturated fats, and an increase in sedentary lifestyles (Mocanu, 2013; Ulijaszek & Koziel, 2007).

**The Present Study**

 As a contribution to the literature, therefore, we prepared a Romanian translation of the BAS-2 and examined its factor structure and psychometric properties in a sample of Romanian adults. First, we began by examining the factor structure of the Romanian BAS-2 using both principal-axis factor analysis and CFA, and based on the available literature we expected to find evidence of a one-dimensional structure with all 10 items. Second, we assessed the scale’s internal consistency, expecting that scores would demonstrate internal reliability. Third, we examined whether BAS-2 scores were invariant across sex, hypothesising that they would be. Based on our expectation of sex invariance, we also hypothesised that men would have significantly higher body appreciation than women. Fourth, we examined the test-retest reliability of BAS-2 scores after three weeks, hypothesising that scores would demonstrate stability across time. Finally, we conducted a preliminary examination of the convergent validity of BAS-2 scores by examining associations with scores from measures of disordered eating, self-esteem, satisfaction with life, subjective happiness, and body mass index (BMI). Evidence of convergent validity would be provided by negative associations with disordered eating and BMI, and positive associations with self-esteem, satisfaction with life, and subjective happiness (cf. Tylka & Wood-Barcalow, 2015b).

**Method**

**Participants**

**Main sample**.Participants of the main study were 212 female and 241 male students from a university in Timiș County in the west of Romania. Participants ranged in age from 17 to 61 years (*M* = 23.57, *SD* = 7.86) and in self-reported BMI from 13.98 to 37.11 kg/m2 (*M* = 22.18, *SD* = 3.46). Most participants were enrolled on undergraduate programmes (72.2%; Masters programmes = 16.1%, other = 11.7%) and self-reported as being of Romanian ethnicity (97.3%). In terms of religion, 68.1% reported being Eastern Orthodox, 8.4% Catholic, 8.0% atheist, and the remainder reported being of some other religious affiliation. These participants completed all the measures listed below.

**Test-retest sample**. The test-retest sample consisted of 57 female and 52 male university students from the same university in the west of Romania. All participants were of Romanian ethnicity and ranged in age from 18 to 57 years (*M* = 25.02, *SD* = 8.91). No further demographics were collected, and these participants only completed the BAS-2 at two time-points three weeks apart.

**Measures**

**Body appreciation.** Participants completed a Romanian translation of the BAS-2 (Tylka & Wood-Barcalow, 2015b). The scale was translated from English into Romanian using the parallel back-translation procedure (Brislin, 1986). First, a bilingual individual unaffiliated with the study translated the scale from English to Romanian, while a second individual translated this version back into English. Next, the items obtained were assessed by a committee consisting of the individuals who participated in the translation process, the third to fifth authors, and two psychology professors who settled minor discrepancies in the translation through consensus. All items are presented in Table 1 and were rated on a 5-point scale, ranging from 1 (*Never*) to 5 (*Always*).

**Symptoms of disordered eating**. The questionnaire included the Body Image Screening Questionnaire for Eating Disorder Early Detection (BISQ; Jenaro, Flores, Tomsa, & Bermejo, 2011; Romanian translation: Tomsa, Istfan, Jenaro, Flores, & Bermejo, 2012). This is a 24-item scale that measures symptomatology of disordered eating along five dimensions, namely bulimia, anorexia, orthorexia, perception of obesity, and vigorexia (i.e., muscle dysmorphia”. Items were rated on a 6-point scale (1 = *Never*, 6 = *Always*). Although a Romanian translation of this scale has been prepared (Tomsa et al., 2012), the authors failed to factor analyse scores derived from the scale and reported that internal consistency coefficients for all but one of the subscales were less than adequate. However, total scores were reported to yield evidence of internal consistency (Cronbach α = .85) and discriminant validity. In the present study, we therefore used an overall BISQ score, computed as the mean of all items following reverse-coding of relevant items. Higher scores on this scale reflect greater degree of eating disorder symptomatology (Tomsa et al., 2012). Cronbach’s alpha for the overall score in the present study was .82 for women and .80 for men.

**Self-esteem**. We included the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965; Romanian translation: Schmitt & Allik, 2005), a 10-item measure of global self-evaluations of worth as a human being. All items were rated on a 4-point scale (1 = *Definitely disagree*, 4 = *Definitely agree*). An overall score was computed as the mean of all 10 items, following reverse-coding of 5 items. Higher scores on this scale reflect greater self-esteem. The Romanian version of the RSES has evidenced factorial validity (Schmitt & Allik, 2005) and patterns of convergent validity (e.g., Sava, Maricuțoiu, Rusu, Macsinga, & Vîrgā, 2011). In the present study, Cronbach α for this scale was .87 for women and .84 for men.

**Satisfaction with life**. The survey package included the 5-item Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985; Romanian translation: Lambru et al., 2012), which taps global assessments of life satisfaction. Items on this scale were rated on a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*). An overall score was computed at the mean of all five items, so that higher scores reflect greater life satisfaction. Scores on the Romanian version of the scale have been shown to have a one-dimensional factor structure and evidence patterns of convergent validity (Lambru et al., 2012). In the present study, Cronbach’s alpha was .85 for women and .86 for men.

**Subjective happiness**. We also included the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999), a 4-item measure that assesses the degree to which respondents consider themselves to be happy or unhappy persons. Items on the scale were rated on a 7-point scales with various anchors. Because a Romanian translation of this scale was not available at the time of the study, we prepared such a translation using the back-translation technique (Brislin, 1986), as described above. To examine the factor structure of scores on this translation of the scale, we computed a principal-axis EFA with the total sample (*N* = 453) using a quartimax rotation because of the expectation of a single factor. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.77) and the significance of Bartlett’s test of sphericity, *χ*2(6) = 642.81, *p* < .001, indicated that these data had adequate factorability. The results of the EFA indicated that only a single factor should be extracted, with an eigenvalue (λ) of 2.52 and explaining 63.0% of the total variance. All four items of the SHS loaded onto this factor and had good-to-excellent factor loadings (.56-.86). These results are consistent with other translational studies of the SHS (e.g., Swami, 2008; Swami et al., 2009). Based on these results, we computed an overall SHS score as the mean of all four items, with higher scores reflecting greater subjective happiness. Cronbach’s alpha was .89 for women and .92 for men.

**Demographics**. Participants provided their demographic details consisting of sex, age, degree programme, ethnicity, and religion. Participants were also asked to self-reported their height and weight, which we used to calculate BMI as kg/m2.

**Procedures**

Ethics approval for this project was obtained from the relevant university ethics committee. The main study was advertised as a project on health and well-being on campus locations between January and March 2017. Individuals who agreed to participate were provided with an information sheet that contained brief information about the projects and provided written informed consent. They then completed an anonymous paper-and-pencil questionnaire in a private cubicle. The questionnaire took approximately 20 minutes to complete and the order of presentation of the scales above was semi-randomised (demographic items were always presented last). All participation was voluntary and participants did not receive any remuneration. Upon return of completed questionnaires, participants were provided with written debrief information.

The test-retest participant sample was recruited in June 2017, and participants were only eligible if they had not taken part in the earlier study. Where participation was agreed, participants provided written informed consent and complete the BAS-2 along with brief demographics in a private cubicle. Three weeks after initial testing, participants were contacted and asked to completed the BAS-2 a second time. No participant declined the invitation. Unique codes were generated to link test-retest data and were destroyed prior to analyses. All participation was voluntary and participants did not receive any remuneration. At the end of the second testing session, participants were provided with written debrief information.

**Statistical Analyses**

Missing data accounted for < 0.6% of the main dataset and were missing completely at random, as determined by Little’s MCAR analyses. In this case, we used the mean replacement technique to estimate missing values. There were no missing data in the test-retest dataset. We used a two-step analytic strategy to examine the psychometric properties of the Romanian BAS-2. First, we split the main dataset so that the first subsample had a random allocation of 100 women and 100 men, and so that the second subsample included all remaining participants (women *n* = 112, men *n* = 141). In the first subsample, we assessed the factor structure of BAS-2 scores in women and men separately, using principal-axis factor analysis in IBM SPSS Statistics v.20. The sample sizes for women and men in this subsample met a conservative item-to-participant ratio of 10:1 (Tabacknick & Fidell, 2013). As in Tylka and Wood-Barcalow (2015b), we used a quartimax rotation as we hypothesised that BAS-2 scores would have a single, orthogonal factor (Pedhazur & Schmelkin, 1990). Factor loadings were interpreted using Tabachnick and Fidell’s (2013) recommendations, with loadings of .71 and above considered excellent, .63-.70 considered very good, .55-.62 considered good, .33-.54 considered fair, and .32 or lower considered poor.

Next, data from the second subsample (*n* = 243) were subjected to CFA using Analysis of Moment Structures (AMOS v.23). Hypothesized modelling was based on the results of the EFA in the first subsample, as well as the expected one-dimensional factor structure. Standard goodness-of-fit indices were selected a priori to assess the measurement models (Hu & Bentler, 1999). The normed model chi-square (χ²normed) is reported with lower values of the overall model χ² indicating goodness-of-fit. A χ²normed value of < 3.00 indicates good fit (we also report the mean chi-square value, χ²M, for completeness). The Steiger-Lind root mean square error of approximation (RMSEA) and its 90% confidence interval provide a correction for model complexity. RMSEA values close to .06 indicate a good fit, with values ranging to .10 representing a mediocre fit. The standardized root mean square residual (SRMR) assesses the mean absolute correlation residual and is a badness-of-fit index: the smaller the SRMR, the better the model fit. A cut-off value for SRMR is recommended to be close to or < .09. The comparative fit index (CFI) measures the proportionate improvement in fit by comparing a target model with a more restricted, nested baseline model.The CFI reflects a goodness-of-fit index and is recommended to close to or > .95 for good fit, but can be as low as .90 for adequate fit.

 In this second subsample, we also examined whether BAS-2 scores were invariant across sex at the configural (i.e., whether similar factors are measured), factor loading (i.e., whether the magnitude of factor loadings is the same), and intercept (i.e., whether the intercept of the regression relating each item to its factor is the same) levels (Chen, 2007). In both subsamples separately, and for both women and men, we examined internal consistency by computing Cronbach’s α. For the test-retest sample (*n* = 109), intraclass correlation coefficients and paired-sample *t*-tests were used to estimate the stability of BAS-2’s scores in women and men separately. To examine sex differences in BAS-2 scores, we planned on using independent-samples *t*-tests. Finally, we examined convergent validity by computing bivariate correlations between BAS-2 scores and scores on all other included measures.

**Results**

**Principal-Axis Factor Analysis**

**Female subsample.** Descriptive statistics (*M*s and *SD*s) for all BAS-2 items for the female subsample (*n* = 100) are reported in Table 1. Based on item distribution, average correlation with other items, and item-total correlations (Clark & Watson, 1995), these data were suitable for factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.92) and the significance of Bartlett’s test of sphericity, *χ*2(45) = 674.52, *p* < .001, indicated that these data had adequate factorability. The results of the factor analysis indicated that only a single factor should be extracted; this factor had an λ of 6.14 and explained 61.4% of the total variance. All 10 items of the BAS-2 loaded onto this factor and had good-to-excellent factor loadings (see Table 1). Cronbach’s alpha was .93 (95% CI = .91-.95), providing evidence of internal consistency.

**Male subsample.** Descriptive statistics for all 10 items for men (*n* = 100) are reported Table 1. These data passed standard criteria for factor analysis (Clark & Watson, 1995). The KMO measure of sampling adequacy was .88 and Bartlett’s test of sphericity was significant, *χ*2(45) = 368.06, *p* < .001, indicative of adequate factorability. Unlike the female sample, however, the results of the factor analysis for men pointed to the existence of two factors with λ > 1.0. In this case, we applied parallel analysis (Hayton, Allen, & Scarpello, 2004) to determine the number of factors that should be extracted. Parallel analysis reduces the likelihood of factor over-retention, which is known to affect other factor extraction criteria (Patil, McPherson, & Friesner, 2010), and works by creating random datasets with the same number of cases and variables as the actual dataset. Factors in the actual data are only retained if their eigenvalues are greater than the eigenvalues from the random data (Hayton et al., 2004). The results of parallel analysis in the present study suggested that only a single factor should be extracted: only the first factor from the actual data had λ greater than the criterion λ generated from the random data (i.e., 4.18 [actual data] compared to 2.99 [random data] for the first factor, and 1.46 [actual data] compared to 2.17 [random data] for the second factor). As such, we retained only the first factor, which explained 41.8% of the common variance. It is important to note that although all items loaded on to the primary factor, loadings were more variable than in the female subsample, with half the items only reaching “fair” loadings (see Table 1). Cronbach’s alpha was .84 (95% CI = .78-.88), demonstrating internal consistency.

**Confirmatory Factor Analysis**

**Hypothesized model fit.** The results of the principal-axis factor analyses with the above subsamples point to a one-dimensional factor structure for Romanian BAS-2 scores, with all 10 items loading onto this dimension. We, therefore, examined the fit of this hypothesised one-factor solution using CFA with the second subsample (*n* = 243). Skewness and kurtosis were below critical limits for CFA (Kline, 2005), so no data were transformed prior to analysis. The standardised estimates of factor loadings for the best-fitting model were all very good-to-excellent (see Figure 1). Fit indices values were found to be: χ²M(35) = 213.719, *p* < .001, χ²normed = 6.106, *p* < .001, CFI = .848, RMSEA = .142 with 90% *CI* = .124-.161, SRMR = .068. These results indicate that fit indices values were not found to be at acceptable intervals. Brown (2014) recommends that error covariances should be freed if there is a theoretical or measurement rationale for doing so. We, therefore, consulted modification indices to free error covariances between Items #2 and #9 due to the similar wording between these items, and between Items #4 and #7 (both items reflect positive and unique body characteristics) and Items #1 and #5 (both items represent attentiveness to the body). This one-dimensional structure provided an acceptable fit to the data: *χ*²M(32) = 98.029, *p* < .001, *χ*²normed = 3.063, *p* < .001, CFI = .950, RMSEA = .090 (low = .070, high = .111), SRMR = .049 (see Figure 1). Cronbach’s alpha was .89 (95% CI = .87-.91) for this subsample.

 **Sex invariance**. The unconstrained model had adequate fit in the female subsample (*n* = 112): χ²M(32) = 59.937, *p* < .001, χ²normed = 1.873, *p* < .001, CFI = .957, RMSEA = .089 with 90% *CI* = .053-.123, SRMR = .050. However, the unconstrained model had poor-to-adequate fit in the male subsample (*n* = 141): χ²M(32) = 77.505, χ²normed = 2.422, CFI = .921, RMSEA = .101 with 90% *CI* = .072-.130, SRMR = .062. Further subsample metrics are reported in Table 2. Differences between the unconstrained and fully constrained model were not significant, indicating that the structure of the model achieved factor loading invariance across sex, Δ*χ*²(9) = 9.986, *p =* .352. In addition, intercept invariance was evaluated, where all item-factor intercepts were constrained equally across participant sex and evaluated against the factor loading invariance model. According to the Δ*χ*², intercept invariance was not supported, Δ*χ*²(10) = 38.389, *p* < .001. However, it has been suggested that Δ*χ*² alone may be an overly stringent criterion of intercept invariance (Chen, Sousa, & West, 2005); Chen (2007) also recommends exploring practical model fit changes between intercept and factorial models, where invariance is demonstrated if ΔCFI < -.010 *and* ΔRMSEA < .015 *or* ΔSRMR < .030. Values in the present study were: ΔCFI = -.023, ΔRMSEA = .050, and ΔSRMR < .001, suggestive of intercept non-invariance. Overall, these data suggest that measurement invariance was not fully achieved, so sex differences in mean scores were not evaluated.

**Convergent Validity**

Using the main sample (*n* = 453), we examined convergent validity by examining bivariate correlations between BAS-2 scores and scores on all other measures. As reported in Table 3, higher body appreciation was significantly and negatively correlated with symptoms of disordered eating and BMI, and positively correlated with self-esteem, satisfaction with life, and subjective happiness in both women and men.

**Test-Retest Reliability**

For the test-retest female sample (*n* = 57), the intraclass correlation coefficient between the BAS-2 scores at the first and second testing sessions three weeks apart was .82 (CI = .59-.86). Mean scores were not significantly different across the first (*M* = 3.90, *SD* = 0.71) and second testing sessions (*M* = 4.02, *SD* = 0.81), *t*(56) = 1.33, *p* = .188. In men (*n* = 52), the intraclass correlation coefficient between the BAS-2 scores at the two testing sessions was .87 (CI = .78-.93). Mean scores were not significantly different across the first (*M* = 3.78, *SD* = 0.76) and second testing sessions (*M* = 3.74, *SD* = 0.81), *t*(51) = 0.45, *p* = .654.

**Discussion**

The primary aim of the present study was to examine the factor structure of a Romanian translation of the BAS-2. Using principal-axis factors analysis with part of our sample, we found that Romanian BAS-2 scores had a one-dimensional factor structure with all 10 items in both women and men (although it should be noted that factor loadings for half the items for men were fair, whereas they were good-to-excellent for women). In addition, using CFA, we found that the one-factor structure had adequate fit to the data from part of the total sample, albeit after freeing error covariances due to similar item wording and content between three item pairs. In broad outline, these findings are consistent with previous studies that have examined the factor structure of BAS-2 scores across different linguistic groups (Alleva et al., 2016; Atari, 2016; Jovic et al., 2016; Kertechian & Swami, 2017; Razmus & Razmus, 2017; Swami & Ng, 2015; Swami et al., 2016, 2017; Tylka & Wood-Barcalow, 2015).

 However, we also found that BAS-2 scores did not evidence configural and intercept invariance across women and men (although factor loading invariance was supported). This is an important finding for several reasons. First, we believe this is the first instance where the sex invariance of BAS-2 scores has not been fully supported: previous CFA-based studies have all reported full sex invariance (Swami et al., 2016, 2017; Tylka & Wood-Barcalow, 2015b). Second, the lack of sex invariance may indicate that the same latent construct (i.e., “body appreciation”) is not being measured by the BAS-2 in women and men. More specifically, it may be that some items on the BAS-2 (Items #3, 5-7, and 10) are less pertinent or central to the meaning of body appreciation in Romanian men. Although the reasons for this may be difficult to ascertain without further research (particularly of a qualitative nature), it is possible that Romanian men hold different attitudes toward the body (Cornelia, 2012), which in turn shape their experiences of body appreciation. A third reason why this finding is important is because the lack of invariance of sex invariance means that a direct comparison of latent BAS-2 scores cannot be conducted.

 Our results also indicated that BAS-2 scores yielded evidence of internal consistency in women and men. In addition, and as hypothesised, we found that BAS-2 scores were significantly and negatively correlated with symptoms of disordered eating and BMI, and positively correlated with self-esteem, satisfaction with life, and subjective happiness. Importantly, the strengths of these correlations were generally moderate, although the association between body appreciation and self-esteem in women was large. Finally, our analyses also indicated that BAS-2 scores had adequate test-retest reliability in both women and men after three weeks. Taken together, these results provide evidence that the BAS-2 is a valid and reliable tool for the assessment body appreciation in Romanian-speaking populations. This is important as there are currently few of such tools available for this linguistic group. The availability of a Romanian translation of the BAS-2 should, therefore, facilitate research in a previously neglected population.

The present results also make contribution to two further aspects of note. First, we found that that a Romanian translation of the SHS had a one-dimensional factor structure. Additionally, the pattern of correlations between SHS scores and scores on measures of self-esteem and satisfaction with life supports the convergent validity of the former. On the other hand, we advise some caution when using the BISQ. Although this scale was developed to measure aspects of disordered eating (Jenaro et al., 2011), evidence of adequate psychometric properties for this scale is less than optimal. BISQ subscale scores appear to have less-than-adequate internal consistency coefficients and, although our use of overall scores may be a better alternative, it is vital that future research fully interrogates the construct validity of this measure. In the present work, we were hampered by the lack of translated and validated measures of body image and disordered eating for Romanian populations, and we suggest that associations with BISQ scores be treated with caution until this scale had received full psychometric evaluation.

Our study is also limited in a number of additional ways. First, our reliance on a student sample means that our findings cannot be generalized to the wider Romanian population, where the percentage of the population in higher education is proportionately small (Eurostat, 2015). It would also be useful to extend the present study to include other Romanian-speaking populations, such as those in Moldova or among the large Romanian migrant diaspora elsewhere in Europe (as well as by several million more as a second language (European Commission, 2012). Finally, future work could extend the present results by examining associations between body appreciation and other factors, to establish the divergent and incremental validity of the Romanian BAS-2.

These limitations notwithstanding, the present study provides preliminary evidence to support the factorial and convergent validity, as well as the internal consistency and test-retest reliability, of a Romanian translation of the BAS-2. However, the lack of sex invariance throws up practical concerns for scholars intending to use this measure. Our recommendation is that scholars and practitioners using the Romanian BAS-2 conduct tests sex invariance in their own datasets to help them determine whether comparisons of latent scores between women and men will be permissible. More broadly, it is notable that the BAS-2 has been translated into a number of different languages (Swami, 2017; Webb et al., 2015) and that scores on the measure retain a one-factor structure across all linguistic groups that have been investigated thus far. This is important as it may facilitate cross-cultural comparisons of BAS-2 scores, which requires that the latent dimensionality of those scores is the same across group. In addition, the availability of a Romanian translation of the BAS-2 provides a vital tool for the assessment of body image in a hitherto neglected linguistic group. We are hopeful that the availability of this measure will stimulate further research into body image in Romanian-speaking populations.

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Table 1. *Items of the Body Appreciation Scales-2 in English and Romanian (Italics), Descriptive Statistics for Women (n = 100) and Men (n = 100), and Item-Factor Loadings in the First Subsample.*

|  |  |  |
| --- | --- | --- |
| Item | Female subsample | Male subsample |
|  | *M* (*SD*) | Loading | *M* (*SD*) | Loading |
| 1. I respect my body/*Îmi respect corpul* | 4.24 (0.73) | .64 | 4.10 (0.81) | .74 |
| 2. I feel good about my body/*Mă simt bine cu corpul meu* | 3.80 (0.95) | .88 | 4.29 (0.83) | .85 |
| 3. I feel that my body has at least some good qualities/*Simt ca acest corp are cel puțin câteva calități* | 4.13 (0.91) | .75 | 4.24 (0.75) | .35 |
| 4. I take a positive attitude towards my body/*Am o atitudine pozitivă față de corpul meu* | 3.82 (1.01) | .85 | 4.20 (0.83) | .76 |
| 5. I am attentive to my body’s needs/*Sunt atent la nevoile corpului meu* | 3.82 (0.86) | .67 | 3.92 (0.92) | .47 |
| 6. I feel love for my body/*Simt dragoste față de corpul meu* | 3.34 (1.16) | .77 | 3.46 (1.15) | .34 |
| 7. I appreciate the different and unique characteristics of my body/*Apreciez caracteristicile diferite și unice ale corpului meu* | 3.83 (1.01) | .79 | 3.74 (1.07) | .42 |
| 8. My behaviour reveals my positive attitude toward my body; for example, I hold my head high and smile/*Comportamentul meu arată atitudinea mea pozitivă față de corpul meu* | 3.52 (1.01) | .80 | 3.73 (0.94) | .63 |
| 9. I am comfortable in my body/*Mă simt bine în corpul meu* | 3.86 (1.04) | .89 | 4.38 (0.80) | .83 |
| 10. I feel like I am beautiful even if I am different from media images of attractive people (e.g., models, actresses/actors)/*Mă simt frumos/frumoasă chiar dacă sunt diferit/ă față de imaginile din media a persoanelor atrăgătoare (ex. modele, actrițe, actori)* | 3.98 (0.97) | .77 | 4.05 (1.00) | .42 |

Table 2. *Model Fit Indices and Tests of Measurement Invariance for the One-Factor Body Appreciation Scale-2 Model Across Participant Sex in the Second Subsample.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *χ*²M | *df* | *χ*²normed | RMSEA (90% CI) | SRMR | CFI |
| Configural Invariance | 150.040 | 64 | 2.344 | .073 (.058, .088) | .064 | .930 |
| Factor Loading Invariance | 160.026 | 73 | 2.192 | .069 (.054, .083) | .069 | .929 |
| Intercept Invariance | 198.415 | 83 | 2.391 | .074 (.061, .088) | .069 | .906 |

*Note. χ*²M = mean chi-square; *χ*²normed = normed chi-square; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; CFI = comparative fit index; CI = confidence interval.

Table 3. *Correlation Matrix with Associations for Women (n = 212*) *Reported in the Top Diagonal and Men* *(n = 241) Reported in the Bottom Diagonal.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| (1) Body appreciation |  | -.54\*\* | .71\*\* | .52\*\* | .44\*\* | -.30\*\* |
| (2) Disordered eating | -.45\*\* |  | -.45\*\* | -.31\*\* | -.13 | .43\*\* |
| (3) Self-esteem | .52\*\* | -.32\*\* |  | .53\*\* | .41\*\* | -.14\* |
| (4) Satisfaction with life | .51\*\* | -.27\*\* | .58\*\* |  | .57\*\* | -.04 |
| (5) Subjective happiness | .41\*\* | -.12 | .46\*\* | .56\*\* |  | -.04 |
| (6) Body mass index | -.28\*\* | .21\*\* | .15\* | .10 | .07 |  |
| Women | *M* | 3.89 | 3.31 | 3.23 | 5.08 | 4.63 | 21.30 |
|  | *SD* | 0.72 | 0.59 | 0.52 | 1.16 | 0.80 | 3.65 |
| Men | *M* | 3.99 | 2.15 | 3.22 | 5.08 | 4.85 | 22.95 |
|  | *SD* | 0.62 | 0.54 | 0.50 | 1.14 | 0.82 | 3.09 |

*Note*. \* *p* < .05, \*\* *p* < .001.



*Figure 1.* Path diagram and estimates for the one-dimensional model of the Body Appreciation Scale-2. The large oval is the latent construct, with the rectangles representing measured variables, and the small circles with numbers representing the unstandardized residual variables (variances). Error covariances were .14 for Items #2 and #9, .21 for Items #1 and #5, and -.16 for Items #4 and #7. The path factor loadings are unstandardised with significance levels determined by critical ratios (all *p* < .001).