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Translation and Validation of a Brazilian Portuguese Version of the Body Appreciation Scale-2 in Brazilian Adults

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**Abstract**

We examined the psychometric properties of a Brazilian Portuguese translation of the Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015). A sample of 990 Brazilian adults (560 women, 430 men; *Mage* = 31.10, *SD* = 8.94) completed the BAS-2 and measures of life satisfaction, self-esteem, actual-ideal weight discrepancy (women only), breast size dissatisfaction (women only), drive for muscularity (men only), and disordered eating behaviours. Exploratory factor analyses indicated that BAS-2 scores reduced to a single dimension with all 10 items in women and men. Confirmatory factor analysis supported the fit of this one-dimensional factor structure following freeing of error covariances between two pairs of items. BAS-2 scores achieved full scalar invariance across sex, and men had significantly higher BAS-2 scores than women. Internal consistency coefficients were adequate and test-retest reliability was supported up to three weeks in a subsample of 221 participants (140 women, 81 men). Evidence of construct validity was demonstrated through positive associations with indices of psychological well-being and negative associations with indices of negative body image and disordered eating behaviours. Availability of a Brazilian Portuguese translation of the BAS-2 should help to promote greater understanding of positive body image in the Brazilian context.

**Keywords:** Body appreciation; Test adaptation; Psychometrics; Brazil; Sex invariance

**1. Introduction**

Interest in, and empirical research on, positive body image has grown dramatically in the past two decades, overturning a historical focus on negative experiences of embodiment (for reviews, see Daniels, Gillen, & Markey, 2018; Tylka, 2018). This shift is important because accumulating evidence suggests that positive and negative body image are independent constructs (Tylka, 2018); that is, positive body image is not merely the absence of negative body image, but is rather an independent and multi-faceted construct (for reviews, see Tylka, 2018, 2019). In addition, positive body image displays unique relationships, over-and-above negative body image, with a range of health-related behaviours and psychological well-being (e.g., Andrew, Tiggemann, & Clark, 2016; Gillen, 2015; Swami, Weis, Barron, & Furnham, 2018). Greater consideration of these issues, and particularly a sustained focus on aspects of positive body image, would therefore allow for improved intervention strategies that offer a more holistic approach for optimising health and well-being (Guest et al., 2019; Tylka, 2018, 2019).

The construct of positive body image is most often conceptualised and measured as *body appreciation*, which refers to “accepting, holding favorable opinions toward, and respecting the body, while also rejecting media-promoted appearance ideals as the only form of human beauty” (Tylka & Wood-Barcalow, 2015a, p. 53). To measure this construct, Avalos, Tylka, and Wood-Barcalow (2005) developed the Body Appreciation Scale (BAS), a 13-item instrument with scores that were one-dimensional in samples of women and men from the United States (Tylka, 2013). However, reproducing this one-dimensional factor structure has proven problematic in some linguistic groups (for a review, see Swami, 2018). Further, due to additional limitations (e.g., low item-factor loadings on some items, differential item wording for women and men, and anachronistic item content), Tylka and Wood-Barcalow (2015b) prepared a revised version of the instrument.

In developing a new measure of body appreciation, Tylka and Wood-Barcalow (2015b) deleted five poor-performing items and developed five new items that more accurately reflected developments in the field of positive body image. The result was the 10-item Body Appreciation Scale-2 (BAS-2). In the parent study with college and community samples from the United States, Tylka and Wood-Barcalow (2015b) used exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to demonstrate that scores on the BAS-2 were one-dimensional. These authors also reported that BAS-2 scores had good test-retest reliability up to 3 weeks, adequate internal consistency coefficients, and good convergent, incremental, and discriminant validity. More recently, the BAS-2 has also been modified for use with children (Halliwell, Jarman, Tylka, & Slater, 2017), adapted to measure state variations in body appreciation (Homan, 2016), and been shown to be invulnerable to priming effects (Dignard & Jarry, 2019). These qualities have ensured that the BAS-2 can be widely-used in the study of positive body image (for reviews, see Tylka, 2018, 2019).

The BAS-2 has also benefitted from sustained investigations of score dimensionality in diverse linguistic and cultural groups. Thus, the results of EFA-based studies have shown that BAS-2 scores are one-dimensional in college samples from Hong Kong (Swami & Ng, 2015), Iran (Atari, 2016), the Netherlands (Alleva, Martijn, Veldhuis, & Tylka, 2016), and the United Arab Emirates (Vally, D’Souza, Habeeb, & Bensumaidea, 2019), as well as a community sample from Serbia (Jovic, Sforza, Jovanonic, & Jovic, 2017). Likewise, the results of CFA-based studies have shown adequate fit of the one-dimensional factor structure in a staff-and-student sample from mainland China (Swami, Ng, & Barron, 2016), college samples from France (Kertechian & Swami, 2017), Iran (Hosseini, Karimi, & Rabiei, 2018), Japan (Namatame, Uno, & Sawamiya, 2017), and Romania (Swami, Tudorel, Goian, Barron, & Vintila, 2017), adolescents from Denmark, Portugal, and Sweden (Lemoine et al., 2018), teachers from Turkey (Anlı, Akın, Eker, & Özcelik, 2015), older adults from Portugal (Meneses, Torres, Miller, & Barbosa, 2019), and community samples from Malaysia (Swami et al., 2019), Poland (Razmus & Razmus, 2017), and Spain (Swami, García, & Barron, 2017).

While support for the one-dimensional factor structure of BAS-2 scores appears conclusive, evidence of invariance across sex is more equivocal. Like the parent study (Tylka & Wood-Barcalow, 2015b), the results of several studies have shown that BAS-2 scores achieve full measurement invariance across sex (Kertechian & Swami, 2017; Lemoine et al., 2018; Meneses et al., 2019; Namatame et al., 2017; Razmus & Razmus, 2017; Swami, García et al., 2017; Swami et al., 2016). On the other hand, only partial sex invariance was obtained in one study (Swami et al., 2019) and only metric invariance across sex was obtained in another (Swami, Tudorel et al., 2017). Likewise, evidence of sex differences on BAS-2 scores is mixed, with some studies reporting that men/boys have significantly higher scores than women/girls (Razmus & Razmus, 2017; Swami et al., 2016; Swami, García et al., 2017; Tylka & Wood-Barcalow et al., 2015b) and others reporting no significant differences (Atari, 2016; Kertechian & Swami, 2017; Lemoine et al., 2018; Meneses et al., 2019; Swami et al., 2019). Even where significant sex differences have been reported, effect sizes have tended to be small or, at best, moderate.

Beyond the stable dimensionality of its scores, another reason for the popularity of the BAS-2 is the evidence of construct validity. For example, BAS-2 scores have been shown to be positively associated with indices of psychological well-being, including self-esteem (Alleva et al., 2016; Atari, 2016; Lemoine et al., 2018; Meneses et al., 2019; Namatame et al., 2017; Razmus & Razmus, 2017; Swami, García, et al., 2017; Swami & Ng, 2015; Swami, Ng, et al., 2016; Swami, Tudorel, et al., 2017), life satisfaction (Atari, 2016; Namatame et al., 2017; Swami, García, et al., 2017; Swami & Ng, 2015; Swami et al., 2016, 2019; Swami, Tudorel, et al., 2017), and subjective happiness (Swami et al., 2019; Swami, Tudorel, et al., 2017). In addition, body appreciation scores are positively associated with scores on other measures of positive body image, such as body satisfaction, body pride, body image flexibility (Alleva et al., 2016; Razmus & Razmus, 2017; Swami, García, et al., 2017; Vally et al., 2019), and inversely associated with indices of negative body image, such as body shame, body dissatisfaction, and actual-ideal weight discrepancy (Jovic et al., 2017; Meneses et al., 2019; Razmus & Razmus, 2017; Swami & Ng, 2015; Swami et al., 2016, 2019), as well as symptoms of disordered eating (Namatame et al., 2017; Swami, Tudorel, et al., 2017).

In addition, BAS-2 scores are negatively associated with negative body image-related constructs, including internalisation of appearance ideals (Jovic et al., 2017; Swami et al., 2019). One aspect that is more equivocal is the association between BAS-2 scores and body mass index (BMI). In theory, it might be expected that BAS-2 scores should be negatively correlated with BMI, given that – for example – BAS-2 scores are positively correlated with intuitive eating, which in turn is associated with lower BMI (e.g., Gast, Campbell Nielson, Hunt, & Leiker, 2015). However, while the results of some studies have shown that BAS-2 scores are significantly and negatively associated with BMI (Alleva et al., 2016; Razmus & Razmus, 2017; Swami, Tudorel, et al., 2017), results from other studies have shown no significant correlations in women (Meneses et al., 2019; Vally et al., 2019) or men (Jovic et al., 2017; Swami & Ng, 2015; Swami et al., 2016, 2019). Conversely, at least one study has reported that BAS-2 scores are significantly and positively correlated with BMI in men (Atari, 2016). Additionally, Swami and colleagues (2019) reported that BAS-2 scores were not significantly associated with drive for muscularity scores in Malaysian men. Overall, however, evidence of the construct validity of BAS-2 appears to be robust across different national groups.

**1.1. Body Appreciation in Brazil**

In tandem with growing international interest in the construct of body appreciation, one previous study has examined the psychometric properties of BAS-2 scores in a sample of Brazilian Portuguese adolescents (Ibáñez, Cren Chiminazzo, Sicilia Camacho, & Teíxeira Fernándes, 2017). Based on CFA, the authors of the study reported that BAS-2 scores were one-dimensional and retained all 10 items. However, closer inspection of fit values reported by these authors in fact suggests poor fit on some indices, suggestive of less-than-adequate factorial validity. In addition, Ibáñez and collagues (2017) also developed a Brazilian Portuguese translation of the BAS-2 using back-translation alone, but sole reliance on back-translation may be considered problematic as it may produce unsatisfactory translations (van Widenfelt, Treffers, de Beurs, Siebelink, & Koudijs, 2005).

More generally, the decision of Ibáñez and colleagues (2017) to proceed to CFA in the absence of EFA means that it is an unanswered question whether alternative factor structures may have better-suited BAS-2 scores in Brazilian populations. This is important because the Brazilian national and cultural context may impact on conceptualisations of body appreciation in important ways. In particular, scholars have noted that that the corporeal self is often assigned heightened value in Brazil, both in terms of attainment of beauty ideals in and of itself (Edmonds, 2010), as well as in the service of work, familial, and social goals (do Nascimento, de Oliveira, Cardoso, dos Santos, da Silva Pinto, & Magalhães, 2016). That is, the body in Brazilian national identity appears to play an important performative role in attaining different forms of cultural capital (Edmonds, 2010), which in turn may shape how Brazilian adults conceptualise appreciation of the body. Consistent with this view, there is some evidence from studies of the factor structure of the BAS to suggest that body appreciation in Brazilian adults is multi-faceted, consisting of components that reflect general body appreciation and a distinct factor related to body image investment (Swami et al., 2011) or body valorisation (i.e., a respect for the body particularly in the face of adversity; Ferreira, Neves, & Tavares, 2014; see also W. da Silva, Neves, Ferreira, Campos, & Swami, 2019). As such, further investigation of the factor structure of the BAS-2 is warranted, particularly in adult populations, for whom corporeal experiences may diverge in unique ways from adolescents.

**1.2. The Present Study**

In the present study, we examined the factor structure and psychometric properties of a Brazilian Portuguese version of the BAS-2. This is important because of the aforementioned limitations of the study by Ibáñez and colleagues (2017), but also in order to determine the appropriate dimensionality of body appreciation in Brazilian adults. More broadly, we suggest that our work is important for scholars wishing to measure the body appreciation construct in Brazilian populations, who need to be certain that the instruments they use are psychometrically valid and reliable. To that end, we followed best-practice recommendations for test adaptation (Swami & Barron, 2019) in subjecting our data to both EFA (which allows for an exploration of the best-fitting model of BAS-2 without any *a priori* limitations in terms of hypothetical modelling) and CFA (which allows for testing the fit of hypothesised models derived from the literature and the EFA results). Based on the available test adaptation studies utilising the BAS-2 – reviewed above – we expected that BAS-2 scores would reduce to a single dimension with all 10 items retained in both EFA and CFA. We also expected that this one-dimensional model would demonstrate full measurement (i.e., configural, metric, and scalar) invariance across sex, which would imply that the BAS-2 is measuring the same construct across women and men. Assuming this to be the case, we also hypothesised that men would have significantly higher BAS-2 scores than women.

We also examined the test-retest reliability of BAS-2 scores after three weeks, hypothesising that scores on the instrument would demonstrate adequate temporal stability. Further, we examined the construct validity of BAS-2 scores through associations with scores on measures that have been translated and validated for use in Brazilian adults. First, to assess associations with psychological well-being, we included measures of self-esteem and satisfaction with life, and expected significant and positive associations between each of these constructs and body appreciation scores. Second, we examined associations with indices of disordered eating attitudes and behaviours and negative body image (i.e., appearance dissatisfaction), respectively, with the expectation of significant and negative associations in both women and men. We also included additional measures of negative body image for women (breast size dissatisfaction and actual-ideal weight discrepancy) and men (drive for muscularity) based on the availability of measures that have been validated for use in Brazilian adults. We expected that body appreciation scores would be significant and negatively associated with breast size dissatisfaction and weight discrepancy in women, and negatively associated with drive for muscularity in men. Finally, we also examined associations between body appreciation and BMI, expecting a negative association in both women and men.

**2. Method**

**2.1. Participants**

**2.1.1. Main sample.** The initial participant pool consisted of 1078 individuals; however, data from 88 individuals were omitted because they did not return a signed informed consent form (*n* = 26), did not meet inclusion or exclusion criteria (*n* = 37), or were missing substantial (i.e., > 80.0%) item-level data (*n* = 25). The final sample, therefore, consisted of 990 adults (560 women, 430 men) who were recruited from among the student and staff population at two universities, as well as parents from three elementary schools, in the state of São Paulo in Brazil. Participants ranged in age from 18 to 50 years (*M* = 31.10, *SD* = 8.94) and in self-reported BMI from 15.35 to 46.17 kg/m2 (*M* = 25.81, *SD* = 4.94). In terms of marital status, 41.4% of the sample were single, 8.9% were in a relationship but unmarried, 42.9% were married, and the remainder were of another status. In terms of educational attainment, 3.5% had completed elementary school, 5.8% had completed middle school, 50.4% had completed high school, 30.2% had an undergraduate degree, and the remainder had some other qualification.

**2.1.2. Retest sample.** Test-retest data from 221 participants (140 women, 81 men) were collected after three weeks. These participants ranged in age from 18 to 50 years (*M* = 25.41, *SD* = 7.59) and in BMI from 16.20 to 39.95 kg/m2 (*M* = 24.52, *SD* = 4.02). The majority of this sample were single (76.9%; in a relationship = 2.7%; married = 15.4%; other status = 5.0%) and, in terms of educational qualifications, 0.5% had completed elementary school, 2.3% had completed middle school, 57.0% had completed high school, 31.2% had an undergraduate degree, and the remainder had another qualification. Compared to those who did not complete the retest, this sample was significantly younger, *t*(988) = 11.41, *p* < .001, *d* = 0.73, and had significantly lower BMI, *t*(988) = 4.45, *p* = .001, *d* = 0.28. There were also significant differences in the distribution of marital statuses, χ2(5) = 153.59, *p* < .001 (the retest group were more likely to be single) and educational attainment, χ2(6) = 18.86, *p* = .004 (the retest group were more likely to have lower educational qualifications).

**2.2. Measures**

**2.2.1. Body appreciation**. Participants were asked to complete a Brazilian Portuguese translation of the 10-item BAS-2 (Tylka & Wood-Barcalow, 2015b). All items were rated on a 5-point scale, ranging from 1 = *never* (Brazilian Portuguese: *nunca*) to 5 = *always* (Brazilian Portuguese: *sempre*). Details of the translation of the BAS-2 into Brazilian Portuguese are provided in Section 2.3 and the items in English and Brazilian Portuguese are reported in Table 1.

**2.2.2. Life satisfaction**. All participants completed the Satisfaction with Life Scale (SLS; Diener, Emmons, Larsen, & Griffin, 1985; Brazilian Portuguese translation: Gouveia, Milfont, da Fonseca, & de Miranda Coelho, 2009). The SLS consists of five items that index respondents’ assessments of the quality of their lives on the basis of their own unique criteria (sample item: “I am satisfied with my life”). All items were rated on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*), and an overall score was computed as the mean of all items. Higher scores on this scale reflect greater life satisfaction. Scores on the Brazilian Portuguese version of the SLS have a one-dimensional factor structure, adequate internal consistency and good construct validity in women and men (Gouveia et al., 2009). In the present work, ω for scores on this scale was .86 (95% CI = .83-.88).

**2.2.3. Self-esteem**. Participants were asked to complete the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965; Brazilian Portuguese translation: Hutz & Zanon, 2011). The 10 items on the RSES measure global perceptions of an individual’s sense of worthiness as a person (sample item: “I feel I have a number of good qualities”) and were rated on a 4-point scale, ranging from 0 = *strongly disagree* to 3 = *strongly agree*. Five items were reverse-coded and an overall RSES scores was computed as the mean of all items. Scores on the Brazilian Portuguese version of the RSES are one-dimensional and have adequate psychometric properties in women and men (Hutz & Zanon, 2011). In the present study, ω for scores on this scale was .81 (95% CI = .78-.84).

**2.2.4. Appearance dissatisfaction**. All participants completed the Appearance Evaluation Subscale of the Multidimensional Body-Self Relations Questionnaire (MBSRQ-AE; Cash, 2000; Brazilian Portuguese translation: Laus, Vales, Oliveira, Braga Costa, & Almeida, 2019), which measures the degree of satisfaction/dissatisfaction with one’s appearance. While the original version of the subscale included seven items, the Brazilian Portuguese version includes only five items (sample item: “I like my looks just the way they are”), as two reverse-keyed items did not load onto the Appearance Evaluation factor are were thus recommended for exclusion (Laus et al., 2019). Items were rated on a 5-point scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree*, and a subscale score was computed as the mean of all five items. Scores were reverse-coded for analyses so that higher scores reflect greater appearance dissatisfaction. Laus and colleagues (2019) reported that scores on the Brazilian Portuguese version of the MBSRQ-AE are one-dimensional and have adequate psychometric properties in Brazilian women and men. In the present study, ω for scores on the MBSRQ-AE was .85 (95% CI = .83-.88).

**2.2.5. Weight discrepancy.** Women were asked to complete the Photographic Figure Rating Scale (PFRS; Swami, Salem, Furnham, & Tovée, 2008; Brazilian Portuguese translation: Swami et al., 2011). The PFRS is a figural rating scale that depicts 10 photographic images of women ranging from ‘emaciate’ to ‘obese.’ Participants were asked to select the figure that most closely matched their own body and the figure that they would most like to possess on a 10-point scale, ranging from 1 = *figure with the smallest body size* to 10 = *figure with largest body size*. A measure of actual-ideal weight discrepancy was computed as the difference between absolute current and ideal ratings. Higher scores reflect greater weight discrepancy. Previous work has shown that the PFRS has adequate patterns of construct validity (Swami et al., 2012), including in Brazilian women (Swami et al., 2011). Men did not complete the PFRS because no male version of the PFRS is available. It is not possible to compute ω for scores on this measure.

**2.2.6. Breast size dissatisfaction**. Women were also asked to complete the Breast Size Rating Scale (BSRS; Swami, Cavelti, Taylor, & Tovée, 2015; Brazilian Portuguese translation: Junqueira et al., 2019). The BSRS consists of 14 computer-generated images of women with increasing breast size. Participants were asked to rate the image that most closely matched their current breast size and the image they would most like to possess, with responses made on a 14-point scale (1 = *figure with the smallest breast size*, 14 = *figure with the largest breast size*). A measure of breast size dissatisfaction was computed as the absolute difference between current and ideal breast size ratings, such that higher scores reflect greater breast size dissatisfaction irrespective of a desire for larger or smaller breast size. Scores derived from the BSRS have been shown to have adequate construct validity in Brazilian women (Junqueira et al., 2019). No comparable measure exists for men and it is not possible to compute ω for BSRS scores.

**2.2.7. Drive for muscularity**. Men were asked to complete the Drive for Muscularity Scale (DMS; McCreary & Sasse, 2000; Brazilian Portuguese translation: Campana, Tavares, Swami, & da Silva, 2013). Although the original DMS contains 15 items, the Brazilian Portuguese version retains only 12 of the items (sample item: “I think that my chest is not muscular enough”), with three items demonstrating less-than-adequate factor loadings (Campana et al., 2013). All items were rated on a 6-point scale, ranging from 1 = *always* to 6 = *never*, and were reverse-coded prior to analyses. Scores on the Brazilian Portuguese version of the DMS consist of two dimensions that load onto a higher order drive for muscularity factor (Campana et al., 2013); for this reason, we computed an overall DMS score as the mean of all 12 items, so that higher scores represent greater drive for muscularity. Only men were asked to complete the DMS as it has not been validated for use in Brazilian women. In the present study, ω for scores on the DMS was .90 (95% CI = .88-.92).

**2.2.8. Eating attitudes and behaviours**. All participants were asked to complete the Eating Attitudes Test-26 (EAT-26; Garner & Garfinkel, 1979; Brazilian Portuguese translation: Nunes et al., 1994). The EAT-26 is widely-used measure of symptoms and concerns characteristic of disordered eating (sample item: “I am terrified about being overweight”). All 26 items were rated on a 4-point scale, ranging from 0 = *never* to 3 = *always*. Validation work with the Brazilian Portuguese translation of this measure in women and men supported a one-dimensional, higher-order factor structure, with higher mean scores reflecting greater pathological eating attitudes and greater risk for developing eating disorders (Bighetti, Santos, Santos, & Ribeiro, 2004). In the present study, ω for scores on the EAT-26 was .76 (95% CI = .73-.80).

**2.2.9. Demographics**. Participants were asked to provide their demographic information, consisting of sex, age, educational attainment, and marital status. Participants also self-reported their height and weight, which was used to compute BMI as kg/m2. Self-reported BMI is strongly correlated with actual BMI in Brazilian adults (Schmidt et al., 1993).

**2.3. Scale Translation**

As described above, although a Brazilian Portuguese translation of the BAS-2 was available (Ibáñez et al., 2017), the authors of this translation relied solely on the back-translation method, which may be problematic (see van Widenfelt et al., 2005). We, therefore, prepared a novel translation of the BAS-2 following the six-step guidelines for test adaptation recommended by Borsa, Damásio, and Bandeira (2012) for use in the Brazilian context. In the first step, three independent, bilingual speakers forward-translated the BAS-2 from English into Brazilian Portuguese. In a second step, a synthesis of the three forward-translations was prepared through a consensual approach by the three translators and the research team. In a third step, the Brazilian Portuguese version of the BAS-2 was pre-tested for clarity and comprehension of items, response format, and instructions with 30 individuals (15 women, 15 men) who matched the characteristics of the target sample. In six focus groups, these participants completed the BAS-2 and discussed the degree of relevance, representativeness, clarity, and comprehensiveness. Based on the discussions, the research team then made minor amendments to the Brazilian Portuguese version of the BAS-2.

In a fourth step, this version of the BAS-2 was back-translated into English by two independent, bilingual speakers. The two back-translations were then synthesised into a single version, which was submitted to an expert committee consisting of six bilingual body image researchers. In a fifth step, the committee evaluated all prepared materials for semantic, idiomatic, cultural, and conceptual equivalence, rating each BAS-2 item on a 3-point scale (1 = *appropriate*, 0 = *moderately appropriate*, -1 = *inappropriate/requires modification*). If two or more members of the committee rated an item as -1, the item was revised through consensual approach by all committee members. In a final step, the pre-final version of the Brazilian Portuguese was presented to a group of 36 participants (25 women, 11 men), similar in demographics to the target population. They were asked to describe, in their own words, what they understood each item to mean and to indicate on a dichotomous scale (*yes* vs. *no*) if they experienced any difficulties understanding each item. None of the items raised any concerns, so the committee accepted the final version of the Brazilian Portuguese BAS-2, a copy of which was submitted to the authors of the original BAS-2 developers. Comparison of our translation to that produced by Ibáñez et al. (2017) indicate a number of minor differences, primarily related to grammatical ordering and word choice.

**2.4. Procedures**

Once ethics approval was obtained from the relevant Institutional Review Board, invitations were made to 2,000 potential participants to take part in a study on body image and well-being between March and October of 2018. Inclusion criteria (being a Brazilian citizen, between the ages of 18 and 50 years, and fluent in Brazilian Portuguese based on self-report) and exclusion criteria (being pregnant at the time of recruitment, having given birth within less than 12 months of recruitment, and having any medical condition that may directly or indirectly influence one’s physical appearance, including rheumatic or autoimmune diseases, cancer, or severe burns) were used to approximate sampling criteria used in studies in the Brazilian context (see Laus, Kakeshita, Costa, Ferreira, de Sousa Fortes, & Almeida, 2014). University staff and students were recruited via direct approaches (i.e., through opportunistic recruitment by directly inviting participation) on campus locations by two trained research assistants, whereas parents from three elementary schools were recruited via posted invitations.

University-based participants who agreed to take part were invited to a laboratory setting, where they completed the questionnaire in a private cubicle. School-based participants who agreed to take part were sent a package containing survey materials, namely an information sheet, an informed consent sheet, an anonymous questionnaire, and debriefing information. To reduce participant fatigue, five versions of the questionnaire were prepared: all contained the BAS-2 and demographic items, but iterations for men included (1) the SLS and RSES (*n* = 234), or (2) the EAT-26, MBSRQ-AE, and DMS (*n* = 238), whereas iterations for women included (3) the EAT-26 and PFRS (*n* = 203), (4) the RSES, SLS, and BSRS (*n* = 207), or (5) the MBSRQ-AE and additional measures not included here (*n* = 196). Thus, participants only saw a selection of measures and did not complete the full questionnaire, which also included measures of body checking behaviours, anti-fat attitudes, self-objectification, and broad conceptualisations of beauty in some iterations. These measures were omitted from analyses in the present work as they have not been, or are currently being, validated for use in Brazilian adults. Each iteration of the questionnaire took approximately 10 minutes to complete.

Of the 2,000 invitations that were made, 1,078 individuals completed and returned the questionnaires, representing a 53.9% response rate. All participants included in the analyses provided written informed consent and completed paper-and-pencil questionnaires in which the order of presentation of the scales was counterbalanced. To examine test-retest reliability, we made invitations to a random selection of 400 university-based participants (i.e., 20.0% of the total invitations) who returned usable data (i.e., with no missing data) in the first phase to complete the BAS-2 during retest using the same basic procedures as before. Of these individuals, 221 returned completed questionnaires, representing a response rate of 55.3%. Those who agreed to take part completed an anonymous, paper-and-pencil questionnaire in a laboratory setting. All participants took part on voluntary basis and were not remunerated for participation.

**2.5. Analytic Strategy**

**2.5.1. Data treatment and overall strategy**. Following the recommendations of Parent (2013), participants who were missing substantial (i.e., > 80.0%) item-level data were deleted listwise. For the remaining participants, 5.1% of item-level data were missing completely at random as determined by Little’s (1988) Missing Completely at Random test, χ2(127) = 150.78, *p* = .074. These data were, therefore, replaced using the mean replacement technique (Parent, 2013), whereby missing values were replaced with the mean of the remainder of participants. To examine the factor structure of BAS-2 scores, we followed Swami and Barron’s (2019) recommendation of using an EFA-to-CFA analytic strategy. To ensure adequate sample sizes in both steps, the total sample was split using a computer-generated semi-random seed, resulting in one split-half for EFA (women n = 200, men n = 200) and a second split-half for CFA (women n = 360, men n = 230). There were no significant differences between the EFA and CFA samples on key demographics (results available from the corresponding author).

**2.5.2. Exploratory factor analysis.** Data from the first split-half were subjected to EFA with principal-axis factoring in IBM SPSS Statistics v. 24, which we conducted separately for women and men. Sample sizes met Worthington and Whittaker’s (2006) recommendation that, where item communalities are ≥ .50 (present study communalities ≥ .53) or there are 10:1 items per factor with factor loadings of about .40, then a sample size of 150-200 may be adequate. The female and male subsamples also met assumptions for EFA based on item distributions, average item correlations, and item-total correlations (Clark & Watson, 1995). To determine whether our data were factorable, we computed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (which should ideally be ≥ .80; Kaiser, 1974) and Bartlett’s test of sphericity (which should be significant). For the EFAs, we followed Tylka and Wood-Barcalow (2015b) in applying a quartimax rotation, which is suitable when a single factor is anticipated. Factor extraction was based on the results of parallel analysis (Hayton, Allen, & Scarpello, 2004), which works by creating a random dataset 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). Item retention was based on Comrey and Lee’s (1992) recommendation that items with “fair” loadings (i.e., ≥ .33) should be retained. Finally, the degree of factor similarity across women and men was assessed using Tucker’s (1951) congruence coefficient, with values between .85 and .94 corresponding to fair similarity across groups and values ≥ .95 suggesting that factor structures can be considered equal across groups (Lorenzo-Seva & ten Berge, 2006).

**2.5.3. Confirmatory factor analysis.** Data from the second split-half were subjected to CFA using the lavaan (Rosseel, 2012), semTools (Jorgensen, Pornprasertmanit, Schoerman, & Rosseel, 2018), and MVN packages (Korkmaz, Goksuluk, & Zararsiz, 2014) with *R* (*R* Development Core Team, 2014). Based on a proactive Monte Carlo simulation (Marcoulides & Chin, 2013), Swami et al. (2019) reported that a sample size of 220 would be adequate for CFA, which our second split-half surpassed. We aimed to test the fit of the one-factor model of BAS-2 scores, as well as the factor structure identified by the EFAs, if different. Assessment of the present data for normality indicated that they were neither univariate (Sharipo-Wilks *p* < .001), nor multivariate normal (Mardia’s skewness = 748.17, *p* < .001, Mardia’s kurtosis = 27.40, *p* < .001), so parameter estimates were obtained using the robust maximum likelihood method with the Satorra-Bentler correction (Satorra & Bentler, 2001). To assess goodness-of-fit, we used the normed model chi-square (χ²/df; values < 3.0 are considered indicative of good fit and up to 5.0 are considered adequate; Hu & Bentler, 1999), the Steiger-Lind root mean square error of approximation (RMSEA) and its 90% CI (values close to .06 are considered to be indicative of good fit and values of about .07-.08 indicative of adequate fit; Steiger, 2007), the standardised root mean square residual (SRMR; values < .09 are considered to be indicative of good fit; Hu & Bentler, 1999), the comparative fit index (CFI; values close to or > .95 indicate adequate fit; Hu & Bentler, 1999), the Tucker-Lewis index (TLI; values close to or > .95 indicate adequate fit; Hu & Bentler, 1999), and Bollen’s Incremental Fit Index (BL89; values close to or > .95 indicate an acceptable fit; Hu & Bentler, 1999).

**2.5.4. Measurement invariance.** Using the CFA subsample, we also assessed measurement invariance at the configural, metric, and scalar levels between sex (women and men) using multi-group CFA (Chen, 2007, 2008). Configural invariance implies that the latent BAS-2 variable and the pattern of loadings of the latent variable on indicators are similar across groups. Metric invariance implies that the magnitude of the loadings is similar across groups and is tested by comparing two nested models consisting of a baseline model and an invariance model. Because the Δ*χ*² statistic is overly stringent to determine criterion invariance, we used ΔCFI < .01 as an indicator of metric invariance (Cheung & Rensvold, 2002). Finally, scalar invariance implies that both the item loadings and item intercepts are similar across groups and is examined using the same nested-model comparison strategy as with metric invariance (Chen, 2007). For scalar invariance, Chen (2007) suggested that invariance is supported when ΔCFI < .01 *and* ΔRMSEA < .015 *or* ΔSRMR < .030, although other scholars suggest that ΔCFI < .01 is sufficient (Cheung & Rensvold, 2002).

**2.5.5. Reliability and construct validity.** Test-retest reliability after three weeks was assessed using intra-class coefficients and paired-samples *t*-tests. Internal consistency was assessed using ω and its associated 95% CI, with values greater than .70 reflecting adequate reliability (Dunn, Baguley, & Brunsden, 2014). In the CFA portion of the dataset, evidence of convergent validity was assessed using the Fornell-Larcker criterion (Fornell & Larcker, 1981), with average variance extracted values ≥ .50 considered adequate (Malhotra & Dash, 2011). Between group differences in BAS-2 across sex, examined using an independent-samples *t*-test, would only be investigated should scalar or partial scalar invariance be established (Davidov, Meulemen, Cieciuch, Schmidt, & Billiet, 2012). Finally, to assess construct validity, we used the total sample and examined bivariate correlations between BAS-2 scores and the additional measures included in the survey.

**3. Results**

**3.1. Exploratory Factor Analysis**

**3.1.1. Female subsample.** For the female subsample from the first split-half (*n* = 200), Bartlett’s test of sphericity, χ2(45) = 1145.80, *p* < .001, and the KMO measure of sampling adequacy, KMO = .92, indicated that the BAS-2 items had adequate common variance for factor analysis. The results of the EFA revealed two factors with λ > 1.0, but parallel analysis indicated 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., 5.52 [actual data] compared to 3.11 [random data]). The second factor derived from the actual data had an λ that was lower than the corresponding criterion λ generated from the random data (i.e., 1.11 [actual data] compared to 2.45 [random data]). As such, we retained a single factor, which explained 55.2% of the common variance. As reported in Table 1, factors loadings ranged from .47 (Item 5) to .88 (Item 9). Omega for all 10 BAS-2 items in this subsample was .91 (95% CI = .89-.93).

**3.1.2. Male subsample**. For the male subsample (*n* = 200), Bartlett’s test of sphericity, χ2(45) = 753.05, *p* < .001, and the KMO measure of sampling adequacy, KMO = .86, suggested that the BAS-2 items were factorable. As with the female subsample, the EFA revealed two factors with λ > 1.0 and the Scree plot suggested a single primary factor with a steep cut-off to a secondary factor. Parallel analysis pointed to the extracted of a single factor: the first factor from the actual data had λ greater than the criterion λ generated from the random data (i.e., 3.13 [actual data] compared to 2.96 [random data]), whereas the second factor derived from the actual data had an λ that was lower than the corresponding criterion λ generated from the random data (i.e., 1.67 [actual data] compared to 2.22 [random data]). We, therefore, retained a single factor, which explained 31.3% of the shared variance. Factor loadings are reported in Table 1 and, as can be seen, loadings ranged from .33 (Item 4) to .80 (Item 8). Omega for the 10-item BAS-2 total score this subsample was .86 (95% CI = .83-.89).

**3.1.3. Factor similarity.** To assess the degree of factor similarity across the female and male subsamples, Tucker’s congruence coefficient was computed. The result (.90) was above the cut-off for fair similarity (.85), but was below the threshold for equality of dimensions (.95). This may reflect the fact that factor loadings in the male subsample were substantially attenuated compared to those in the female subsample.

**3.2. Confirmatory Factor Analysis**

**3.2.1. Confirmatory factor analysis.** In the second split-half subsample (*n* = 590), we examined the fit of a one-factor model of BAS-2 scores, which is consistent with the broader literature and our EFA results. Fit indices were: SBχ²(35) = 162.84, SBχ²normed = 4.65, robust RMSEA = .091 (90% CI = .077-.105), SRMR = .040, robust CFI = .946, robust TLI = .931, BL89 = .947. Since fit indices were less than adequate, suggested modification indices were considered to improve model fit. Error covariances were successively freed in accordance with the results from likelihood ratio tests for Items 2 and 9 [MI = 48.41; χ²(1) = 44.96, *p* < .001], and then Items 1 and 5 [MI = 34.30; χ²(1) = 34.61, *p* < .001]. These modifications resulted in an adequately-fitting model, SBχ²(33) = 104.16, SBχ²normed = 3.16, robust RMSEA = .069 (90% CI = .055-.084), SRMR = .030, robust CFI = .970, robust TLI = .960, BL89 = .971. In this subsample, omega was .91 (95% CI = .90-.93). The standardised estimates of factor loadings were all adequate (see Figure 1). The convergent validity for this model was adequate, as the average variance extracted (AVE) was greater than .50 (AVE = .52).

**3.2.2**. **Sex invariance.** We tested for measurement invariance across sex using the second split-half subsample. Values for ΔCFI and ΔRMSEA, and ΔSRMR supported scalar invariance. Omega was adequate for women (.91, 95% CI = .89-.92) and men (.92, 95% CI = .90-.93). Men (*M* = 3.95, *SD* = 0.74) had significantly higher BAS-2 scores than women (*M* = 3.70, *SD* = 0.77), *t*(588) = 3.90, *p* < .001, *d* = 0.32.

**3.3. Further Analyses**

**3.3.1. Test-rest reliability**. The intra-class coefficient between the BAS-2 scores at the first and second administration was .81. There was also no significant difference in BAS-2 scores between administration periods, *t*(220) = 1.38, *p* = .056, which supports test-retest reliability up to three weeks.

**3.3.2. Construct validity**. Using the total sample, we computed associations between body appreciation and all other variables for women and men, respectively. As shown in Table 3, BAS-2 scores in women were significantly and positively associated with life satisfaction and self-esteem, and negatively associated with appearance dissatisfaction, weight discrepancy, breast size dissatisfaction, disordered eating behaviours and attitudes, and BMI. In men, body appreciation was significantly and positively associated with life satisfaction and self-esteem, and negatively associated with appearance dissatisfaction, drive for muscularity and disordered eating behaviours and attitudes, respectively. The association between body appreciation and BMI did not reach significance in men.

**4. Discussion**

Our aim in the present study was to examine the psychometric properties of a Brazilian Portuguese translation of the BAS-2 with a sample of Brazilian adults. In terms of the factor structure of BAS-2 scores, our results are consistent with the parent study (Tylka & Wood-Barcalow, 2015b) and previous translational studies (Alleva et al., 2016; Anlı et al., 2015; Atari, 2016; Hosseini et al., 2018; Jovic et al., 2017; Kertechian & Swami, 2017; Lemoine et al., 2018; Namatame et al., 2017; Razmus & Razmus, 2017; Swami & Ng, 2015; Swami et al., 2016, 2019; Swami, García, et al., 2017; Swami, Tudorel, et al., 2017; Vally et al., 2019), which have suggested that scores on this instrument are one-dimensional. Indeed, we were able to extract a single dimension with all 10 BAS-2 items using both EFA (in women and men) and CFA. Our results are also consistent with the findings of a study with Brazilian adolescents (Ibáñez et al., 2017). Overall, it is possible to conclude that the BAS-2 is a psychometrically-valid measure for use in adolescent and adult Brazilian samples.

Despite this consistency across cultural groups, several issues concerning the BAS-2 factor structure in the present study should be highlighted. First, our EFAs suggested the existence of two factors in both women and men; although parallel analyses indicated that a single factor should be extracted, and our CFA confirmed the fit of this one-dimensional model, the issue of dimensionality may warrant closer inspection in future work. This is important given that previous studies using the BAS have generally suggested that scores on the measure in Brazilian Portuguese-speaking populations are multi-dimensional (Ferreira et al., 2014; Swami et al., 2011). In particular, it has been suggested that body image investment or body valorisation may form a distinct component of body appreciation (Neves, Lorey, Campana, Ferreira, & Silva, 2015). However, items that load onto this secondary BAS component are not included in the BAS-2, so this is unlikely to fully account for the present findings.

Another possibility is that some items of the BAS-2 do not fully align with the conceptualisation of body appreciation in Brazilian Portuguese. For example, it was apparent in the EFAs that loadings were substantially attenuated on Items 1, 2, 3, 4, and 9, particularly in men. Again, this may be suggestive of score multi-dimensionality, although understanding reasons for this is difficult in the absence of further data. It should be noted that a previous study with Malaysian adults (Swami et al., 2019) also reported factor loading deflation, although in that case it affected the EFA conducted with women. Item 1 (“I respect my body”), in particular, appears to be problematic across studies and may reflect cross-linguistic differences in understandings of, or meanings ascribed to, the term ‘respect.’ We might extend this argument to suggest that positive valuations of the body (e.g., respect for the body, feeling good about the body, taking a positive attitude toward the body) might be complex in some national contexts, particularly where heightened valuations of corporeal capital are normalised and pervasive (Edmonds, 2010).

Finally, we highlight that adequate CFA fit was only achieved following the freeing of covariances between two pairs of items. Although this is consistent with some previous translational studies (Kertechian & Swami, 2017; Swami et al., 2016, 2019; Swami, García, et al., 2017), it is suggestive of possible item-content overlap in the Brazilian Portuguese BAS-2. One way of advancing knowledge in this area would be to utilise an emic approach (Brislin, Lonner, & Thorndike, 1973), in which understandings of body appreciation are examined with Brazilian adults specifically and used to develop new item content. This speaks to broader translational issues concerning the reliance on instruments that were initially developed in Western settings (see Swami & Barron, 2019). Although we emphasise that the BAS-2 is appropriate for use in Brazil, further exploration of the meanings of positive body image and body appreciation among Brazilians would also be valuable.

In addition to assessing factorial dimensionality, we also examined sex invariance of BAS-2 scores in our sample. Our results showed that full scalar invariance was achieved, which is consistent with the parent study (Tylka & Wood-Barcalow, 2015b) and some translational studies (Kertechian & Swami, 2017; Lemoine et al., 2018; Meneses et al., 2019; Namatame et al., 2017; Razmus & Razmus, 2017; Swami, García et al., 2017; Swami et al., 2016). Nevertheless, it should be noted that the EFAs suggested that the EFA-derived factor structures were not equal for women and men, as assessed by Tucker’s congruence coefficient, which may reflect the attenuated factor loadings in men. When we compared BAS-2 scores across sex, we were able to confirm our hypothesis that men would evidence significantly higher scores than women. This is consistent with some previous studies (Razmus & Razmus, 2017; Swami et al., 2016; Swami, García et al., 2017; Tylka & Wood-Barcalow et al., 2015b), although it should be pointed out that the effect size of the difference in the present study was small.

Beyond issues of factorial dimensionality and measurement invariance, our additional results provide strong evidence of the psychometric properties of BAS-2 scores in Brazilian adults. First, internal consistency coefficients were consistently adequate (ω ≥ .86 in all analyses) and test-retest reliability was supported up to three weeks. However, caution should be exercised when interpreting the latter result given that our retest sample showed significant differences from the non-retest group in terms of key demographics. Second, we were able to support the construct validity of BAS-2 scores in the present study. Specifically, BAS-2 scores were significantly associated in the expected directions with scores on indices of psychological well-being, other measures of body image, and a measure of symptoms of disordered eating attitudes and behaviours. The association between body appreciation and BMI was significant and negative in women, but did not reach significance in men. Given the equivocal nature of associations between body appreciation and BMI in previous studies, it might be questioned to what extent BMI adequately provides an index of construct validity, particularly in men.

Strengths of the present work include the robust translational procedures that we followed to develop the Brazilian Portuguese BAS-2 and the recruitment of a large, mixed sample of adults. Nevertheless, there are a number of limiting issues with the present study, some of which have been highlighted above. Additionally, although steps were taken to ensure that our sampling strategy approximates other body image studies that have been conducted in Brazil (Laus et al., 2014), our sample should not be considered representative of all adults in São Paulo, let alone the rest of Brazil. Research in this area would benefit from the recruitment of more representative samples, particularly from other regions in Brazil. It would also be useful to examine measurement invariance of BAS-2 scores across other population segments of Brazil, including in terms of sexual orientation and ethnicity. In a similar fashion, it is possible that our sampling was limited by self-selection biases, given that “body image” was mentioned in invitations to potential participants.

Given the measures that were included the present study, namely a preponderance of measures of body image, we also cannot rule out the possibility of hypothesis-guessing and/or socially-desirable responding. Although steps were taken to reduce these risks (e.g., counterbalancing the order of presentation of measures within the questionnaire), it nevertheless remains a possibility that were order effects that affected our results within particular iterations of the questionnaires. Finally, future work should also seek to include additional measures that would help to evidence the construct validity of BAS-2 scores. This might include measures that have been validated for use in Brazilian adults, including measures of intuitive eating (da Silva et al., 2019) and body and appearance self-conscious emotions (Chiminazzo, Alcaraz-Ibáñez, & Sicilia, 2019).

To conclude, the results of the present study support the psychometric properties of a Brazilian Portuguese translation of the BAS-2 in Brazilian adults. Our results add to a growing body of work suggesting that the BAS-2 is a psychometrically-valid tool that can be used in different cultural and linguistic groups (Tylka, 2018, 2019). In the context of Brazil, the availability of the BAS-2 provides an important resource for scholars wishing to operationalise positive body image, without the dimensionality-related concerns that affect the BAS. For scholars internationally, an important next step will be to determine the extent to which body appreciation, as indexed by the BAS-2, demonstrates cross-cultural measurement invariance. This will be important to facilitate future cross-cultural research and to better understand the nature of body appreciation in different cultural groups.

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Table 1.

*Body Appreciation Scale-2 Items in English and Brazilian Portuguese and Associated Item-Factor Loadings for Participants in the Present Study*

|  |  |  |
| --- | --- | --- |
| BAS-2 items / *Brazilian translation* | Women | Men |
| 1. I respect my body / *Eu respeito meu corpo* | .55 | .34 |
| 2. I feel good about my body / *Eu me sinto bem com meu corpo* | .81 | .36 |
| 3. I feel that my body has at least some good qualities / *Eu sinto que meu corpo tem, pelo menos, algumas qualidades positivas* | .63 | .47 |
| 4. I take a positive attitude towards my body / *Eu tenho uma atitude positiva em relação ao meu corpo* | .75 | .33 |
| 5. I am attentive to my body’s needs / *Eu sou atento(a) às necessidades do meu corpo* | .47 | .55 |
| 6. I feel love for my body / *Eu sinto amor pelo meu corpo* | .84 | .72 |
| 7. I appreciate the different and unique characteristics of my body / *Eu aprecio as características diferentes e únicas do meu corpo* | .81 | .78 |
| 8. My behaviour reveals my positive attitude toward my body; for example, I hold my head high and smile / *Meu comportamento revela minha atitude positiva em relação ao meu corpo; por exemplo, mantenho minha cabeça erguida e sorrio* | .75 | .79 |
| 9. I am comfortable in my body / *Eu me sinto confortável com meu corpo* | .88 | .57 |
| 10. I feel like I am beautiful even if I am different from media images of attractive people (e.g., models, actresses/actors) / *Eu sinto que sou bonito(a) mesmo que eu seja diferente das imagens de pessoas atraentes da mídia (ex: modelos, atrizes/atores)* | .81 | .78 |

Table 2

*Measurement Invariance Across Sex in the Present Study*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | χ² | *df* | CFI | RMSEA | SRMR | Model Comparison | Δ*χ*² | ΔCFI | ΔRMSEA | ΔSRMR | Δ*df* | *p* | PGFI |
| Configural | 125.74 | 66 | .976 | .055 | .033 |  |  |  |  |  |  |  | .504 |
| Metric | 135.51 | 75 | .975 | .060 | .045 | Configural vs. metric | 9.77 | .001 | .005 | .012 | 9 | .520 | .572 |
| Scalar | 183.15 | 84 | .960 | .071 | .050 | Metric vs. scalar | 47.64 | .015 | .011 | .005 | 9 | <.001 | .639 |

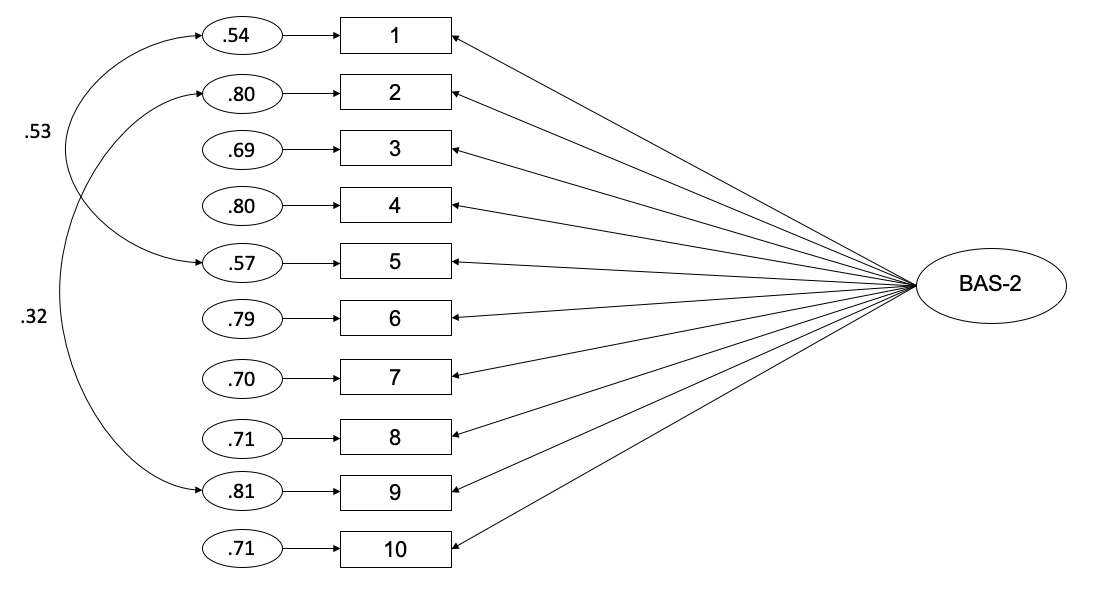
*Note*. CFI = Comparative fit index; RMSEA = Steiger-Lind root mean square error of approximation; SRMR = standardised root mean square residual; PGFI = Parsimony goodness of fit index.

Table 3

*Associations between Body Appreciation and Additional Measures for the Main Sample*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1. Body appreciation |  | .43\*\* | .46\*\* | -.68\*\* | -.41\*\* | -.26\*\* | - | -.16\* | -.19\*\* |
| 1. Satisfaction with life | .35\*\* |  | .53\*\* | - | - | -.23\*\* | - | - | -.15 |
| 1. Self-esteem | .42\*\* | .42\*\* |  | - | - | -.17\* | - | - | .04 |
| 1. Appearance dissatisfaction | -.66\*\* | - | .11\* |  | - | - | - | - | .26\*\* |
| 1. Actual-ideal weight discrepancy | - | - | - | - |  | - | - | - | .71\*\* |
| 1. Breast size dissatisfaction | - | - | - | - | - |  | - | - | .17\* |
| 1. Drive for muscularity | -.15\* | - | - | .08 | - | - |  | - | - |
| 1. Disordered eating behaviours and attitudes | -.24\* | - | - | .18\* | - | - | .34\*\* |  | .03 |
| 1. Body mass index | -.10\* | .04 | -.02 | .27\*\* | - | - | - | -.08 |  |

*Note*. Results for women are reported in the upper diagonal and for men in the lower diagonal; No participant completed every measure, which accounts for empty cells; \**p* < .05, \*\**p* < .001.



*Figure 1.* Path diagram and estimates for the one-dimensional model of Body Appreciation Scale-2 scores. The large oval is the latent construct, with the rectangles representing measured variables, and the small circles with numbers representing the residual variables (variances). The path factor loadings are standardised with significance levels were determined by critical ratios (all *p* < .001).