# The Body Esteem Scale for Adults and Adolescents: Translation, adaptation and psychometric validation among Brazilian adolescents

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## Abstract

A lack of rigorously validated body image measures for use among adolescents is hampering research in Brazil. This study aimed to validate a Brazilian Portuguese version of the Body Esteem Scale for Adults and Adolescents (BESAA; Mendelson et al., 2001). The BESAA was forward and back translated from English into Brazilian Portuguese before examining its factor structure, reliability, and validity among 475 adolescents (50.3% girls) aged 13 – 18 years ($M_{age}$ = 15.35) from various regions across Brazil. Exploratory factor analysis identified an 18-item three-factor solution, with Appearance-Positive, Appearance-Negative, and Weight subscales. The removal of five problematic items led to a psychometrically robust model, invariant across gender and age, and was verified using confirmatory factor analysis. Test re-test reliability and internal consistency were good-to-excellent across all three factors (Cronbach's $a$ = .85, .88, and .89). Concurrent validity was established through significant correlations with body dissatisfaction. Convergent validity was demonstrated via significant correlations with positive and negative affect. This Brazilian Portuguese version of the BESAA is a valid, reliable, and psychometrically robust measure of body image suitable for administration among adolescents in Brazil.


***Keywords*:** body image, Brazil, adolescents, body esteem, psychometric validation.

**Abbreviations:**

EFA – Exploratory Factor Analysis

CFA – Confirmatory Factor Analysis

LMICs – Low- and Middle-Income Countries

BESAA – Body Esteem Scale for Adults and Adolescents

AP – Appearance-Positive subscale

AN – Appearance-Negative subscale

W – Weight subscale

# 1. Introduction

Brazil is the largest country in South America and home to 46 million young people (IBGE, 2020). Brazilians, however, remain relatively under-represented in the body image literature. This is problematic, given an estimated 80% of Brazilian adolescents report body image concerns (Leal et al., 2020), a similar, if not higher, prevalence to adolescents elsewhere in the world (e.g., China; Ren et al., 2018, India; Ganesan et al., 2018, UK; Bornioli et al., 2019, and the US; McLean et al., 2021). The risk associated with body image concerns among Brazilian adolescents include sedentary lifestyles, anxiety, depression, eating disorders, and suicidal thoughts, a trend that mirrors adolescents across the globe (Amaral & Ferreira, 2017; Gomes et al., 2021; Soares et al., 2020). To understand body image prevalence and trends among Brazilian adolescents, as well as to assess prevention and intervention efforts of evidence-based approaches, psychometrically sound measures are imperative.

## 1.1. Assessing Body Image in Brazil

Historically, body image measures have been developed and validated for use in high-income countries (i.e., among Australian, North American, and Western European samples), with little consideration given to accurately assessing body image within culturally diverse samples and low- and middle-income countries (LMICs; Swami & Baron, 2019, Swami et al., 2021). This measurement disparity between countries has been highlighted by experts in the field (see Kling et al., 2019, for a review; Garbett et al., 2021), who have consequently called for greater research in more diverse contexts, including with young people in Brazil (Laus et al., 2014).

An early review by Laus and colleagues (2014) identified 44 body image measures developed for use among Brazilian samples. Of these, six measures targeted adolescents' body weight or shape dissatisfaction, with a majority being variants of a figure or contour

rating scale. No measure assesses body image holistically among Brazilian adolescents (i.e., encapsulates a broad spectrum of appearance characteristics beyond weight and shape). Most studies provided sufficient detail regarding the translation of the measures (i.e., from English to Brazilian Portuguese); however, other essential details related to psychometric validation were omitted. These included cognitive interviews with the target population (Willis, 2015), construct validity, and evidence of conducting both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). This raises concerns regarding the rigour and reliability of these measures (Xavier et al., 2015). Lau and colleagues identified the Escala Evaluacion de Insatisfactión Corporal (Conti et al., 2009) as the most robust measure for use among Brazilian adolescents, but it does not meet the validation guidelines set out by Swami and Baron (2019; 2021). For example, EFA, but not CFA was undertaken in this study, along with examination of construct validity.

Since this review, several advancements have occurred. For example, Amaral and colleagues (2011, 2015) adapted and validated the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3; Thompson et al., 2004) among Brazilian adolescents. The authors followed all steps outlined by Swami and Baron (2019, 2021), resulting in a comprehensive example of how existing measures can be adapted and psychometrically validated for use in culturally different contexts. Of note, the SATAQ-3 assesses risk factors associated with body image concerns (e.g., internalisation of sociocultural pressures), rather than body image behaviours, perceptions, affect, and cognitions. Since Lau and colleagues' (2014) review, three body image measures have undergone adaptation and validation among Brazilian adolescents. These include the Body Change Inventory (BCI; Ricciardelli & McCabe, 2002), which was adapted and validated by both Conti and colleagues (2012) and Meireles and colleagues (2015), the Body Appreciation Scale (BAS-2; Tylka & Wood-Barcalow, 2015), which was adapted by Ibáñez and colleagues (2017), and the Body and

Appearance Self-Conscious Emotions Scale (BASES; Castonguay et al., 2014), which was validated by Chiminazzo and colleagues (2021). The BCQ validation was thorough, but EFA was not completed prior to CFA. For the BAS-2, the authors relied solely on back translation, which may produce inaccurate translations (Van Widenfelt et al., 2005), and then proceeded to CFA without EFA. For the BASES validation, this included forward and back translation alongside cognitive interviews, but the authors did not conduct EFA prior to CFA.

Despite the above progress, a holistic body image measure that follows recent validation guidelines (including robust forward and back translation, EFA, and CFA; Swami & Barron, 2019) does not exist for use among Brazilian adolescents. This has several implications for advancing the research field. Specifically, a psychometrically valid body image measure provides (1) an extensively validated tool for assessing body image, and (2) an efficacy tool for body image prevention and intervention approaches among Brazilian adolescents, which is an emerging field.

### 1.2. The Body Esteem Scale for Adults and Adolescents (BESAA)

The Body Esteem Scale for Adults and Adolescents (BESAA; Mendelson et al., 2001) is a widely used self-report measure of body image (see Kling et al., 2019 for a review) that was originally developed for use with Canadian young women (Mendelson et al., 1996). The original 23-item measure spans three subscales: Appearance (i.e., assessing general feelings and satisfaction with overall appearance), Weight (i.e., evaluating general feelings and satisfaction regarding weight), and Attribution (i.e., evaluations attributed to others about one's appearance). The value of this scale lies in its broad conceptualisation of appearance, and its assessment of both cognitive and affective body image (Mendelson et al., 2001). This scale is aptly suited for use in various cultural groups, where the nature of body image concerns may vary. In the context of Brazil, adolescents experience weight and shape concerns (Carvalho et al., 2020; Moehlecke et al., 2020), as well as concerns about their skin

shade and hair (Gillam, 2017). Unlike many scales that focus on weight and shape exclusively, the BESAA captures all these concerns through its holistic framing of appearance (e.g., “My appearance makes me sad;” “I like how I look in photos”).

Since its development, the BESAA has undergone validation among adolescents in diverse cultural contexts including Italy, Turkey, and India. Among Italian and Turkish samples, the three-dimensional factor structure was supported with the removal of several items due to poor factor loadings. This resulted in 14 items and 15 items for the Italian and Turkish samples, respectively (Confalonieri et al., 2008; Arslan et al., 2020). Both the Italian and Turkish BESAA were internally consistent ($\alpha = 0.85 – 0.89$) and demonstrated adequate construct validity through significant associations with psychological well-being (e.g., self-esteem) and body dissatisfaction. More recently, the BESAA has undergone validation among Indian adolescent girls and boys (Garbett et al, 2021). Among girls, a three-factor structure provided the best model fit, and for boys, a two-factor structure. Unlike the original version, and the Italian and Turkish versions, positively-worded items loaded onto one factor, and negatively-worded items loaded onto a second factor, for both girls and boys. For girls, a distinct weight factor also emerged, similar to the original scale but in contrast with the findings among Italian and Turkish samples. Together, these studies demonstrate the BESAA to be a robust measure of body image across a range of languages and cultural contexts. They also highlight the importance of examining the BESAA’s factor structure in new cultural contexts, due to the diversity of findings between countries. There is no (Brazilian) Portuguese version of the BESAA with adequate psychometric properties, and therefore it is important to follow recommended guidelines for adaptation (Swami & Baron, 2019).

### 1.3. The Present Study

This study used the validation guidelines for body image measures (Swami & Baron, 2019, Swami et al., 2021) to develop a Brazilian Portuguese version of the BESAA for use

among adolescents aged 13 to 18 in Brazil. First, existing models from Italy, Turkey, and India were tested to investigate their fit in the current data. Due to the cultural differences between these countries and Brazil, a good fit between the new and existing BESAA was not expected. Second, the factor structure of the BESAA was examined via EFA and CFA. Third, construct validity of the BESAA was assessed by examining correlations between the BESAA and body dissatisfaction, as measured by the Figure Rating Scale (FRS; Thompson & Altabe, 1991 [English]; Conti & Latorre, 2009 [Portuguese]). Meanwhile, convergent validity was assessed through examining the correlation between the BESAA and mood, as measured by the eight-item Positive and Negative Affect Schedule for Children (PANAS-C8; Damásio et al., 2013). It was hypothesised that the BESAA would be negatively correlated with body dissatisfaction and negative mood, and positively correlated with positive mood.

## 2. Methods

### 2.1. Participants

Brazilian adolescents ($N$ = 475: 50.3% girls, 49.7% boys) aged between 13 and 18 years ($M$ = 15.39, $SD$ = 1.73) were recruited by a Brazilian research agency (Toluna) either directly (for those aged 18 years) or via their parents. All pre-existing panellists of Toluna aged 18 years were sent a recruitment questionnaire and given information regarding what the study would involve. Similarly, panellists over 30 years of age were sent a recruitment questionnaire to request the participant of a daughter/son. Participants were geographically diverse, residing across 24 states of Brazil (see Table A1 for a breakdown of regions of residence in Brazil and Table 1 for participant demographics).

### 2.2. Measures

#### *2.2.1. Body Esteem*

Body esteem was measured using the BESAA (Mendelson et al., 2001). The original scale consists of 23 items across three subscales: Appearance, Weight, and Attribution. Items

are scored on a 5-point Likert scale ranging from 1 (*nunca/never*) to 5 (*sempre/always)*, with negatively-worded items reverse scored. The authors followed measures translation guidelines published by Swami and Baron (2019). Firstly, the fourth, fifth, and sixth authors reviewed the original scale to determine concept and item equivalence within the Brazilian context, based upon their cultural knowledge and research expertise. The scale was determined conceptually sound; however, some items underwent minor adjustments (e.g., replacing the word "looks" with "appearance") to aid comprehension. Next, the scale was translated into Brazilian Portuguese (i.e., forward translation) independently by two native Brazilian Portuguese speakers (including the fifth author). The first, second, and third authors then compared and reviewed the translations. If any discrepancies were found, (e.g., for the scale anchors, "frequently" was translated into both "frequentemente" and "com frequência") these were discussed with both translators to find consensus. Then, independent back translation by two additional Brazilian Portuguese speakers who were fluent in English were conducted. Following this, cognitive interviews (Swami & Baron, 2019, 2021; Willis, 2015;) were conducted by the fourth author with 10 adolescents (5 girls, 5 boys) aged 13-18 years old ($M$ = 15.0) to ensure target respondents understood the items as the researchers intended. Cognitive interviews were completed virtually via Google Meet or WhatsApp using video, in light of the COVID-19 pandemic. Adolescents were asked to complete each item as it was presented on the screen. They were requested to explain what the question was asking of them using their own words. The fourth author noted minor difficulties with understanding two items; therefore, these items underwent minor revisions. Specifically, item 20, "My appearance helps me with my love life", was revised to "My appearance helps me to get romantic dates". Item 21, "I worry about my appearance" was changed to "I get distressed about my appearance" as the translation for "worry" in Brazilian Portuguese also translates to "care about", which changes the meaning of the item. Following these amendments, a second

round of cognitive interviews was conducted with 6 adolescents (3 girls, 3 boys). No issues were reported; therefore, the scale was finalised without further revisions.

#### *2.2.2. Body Dissatisfaction*

Body dissatisfaction was measured using the Brazilian version of the FRS (Thompson & Altabe, 1991 [English]; Conti & Latorre, 2009 [Portuguese]) to assess concurrent validity. Adolescents were presented with nine gender-specific body silhouettes in ascending order from left to right (1 = *smallest body*; 9 = *largest body*). Participants were asked to select the body that looks most like them (actual body) and the body they would most like to look like (ideal body). Body dissatisfaction was scored as the discrepancy between an individual's actual and ideal body, with higher scores reflecting greater body dissatisfaction. Figure rating scales are widely used in research in Brazil and this measure has been culturally validated for use among Brazilian adolescents with good test re-test reliability ($r_{ICC}$ = .80 – .86; $p$ < .001; Kakeshita et al., 2009).

#### *2.2.3. Mood*

Mood was measured using the PANAS-C8 (Damásio et al., 2013) to examine convergent validity. The scale contains a total of eight items with two affect subscales related to Positive (e.g., *alegre/joyful*) and Negative (e.g., *irritado/irritated*) emotions. Adolescents were asked to indicate the degree to which they have experienced each emotion over the past seven days on a Likert scale from 1 (*nem um pouco/not even a little*) to 5 (*muitíssimo/very much*). The PANAS-C8 has been validated among Brazilian adolescents, demonstrating good internal consistency (Positive Affect α = .77; Negative Affect α = .76; Damásio et al., 2013).

### 2.3. Procedure

The study was conducted online using Qualtrics. Eligible parents were sent a study advertisement and information sheet, and consent form via email. Following parental consent, adolescents received a link to the online survey via e-mail, containing a participant

information sheet and assent form. Following assent, participants completed brief demographic questions (age, gender, ethnicity) and all three measures (BESAA, FRS, PANAS-C8) privately at home. The survey took approximately 10 minutes for participants to complete. Participants received research agency credit for participation, which they could exchange for gift vouchers. A sub-sample of participants ($n$ = 100) were randomly selected to complete the survey again, between 7 and 20 days later to evaluate test-retest reliability. Ethics approval was obtained from the first author's institution. Participants received research agency credit for their participation to the value of R$2.50 (£0.36). Credits can be exchanged for a gift or a voucher via the research agency website.

**2.4. Statistical Analyses**

Missing data was minimal (0.6% of responses), therefore multiple imputation for the missing data was deemed unnecessary. Three respondents (two girls and one boy) with missing data were removed before analyses were conducted on the final sample, due to factor analysis requiring complete data patterns ($N$ = 472). There were 14 missing age responses, however, data for these respondents were retained (given the detailed screening procedures for participation, there was a high level of confidence that these individuals were within the 13 – 18 years age range). For analyses that required the age variable, listwise deletion of missing responses was used.

The order of the factor analysis was as followed. The fit of several models suggested in the literature were initially evaluated through confirmatory factor analysis (CFA). As the fit of existing models was less than satisfactory in our data, we proceeded with exploratory factor analysis (EFA) in a random split of half of the data to identify potential improvements to the model, and then CFA to confirm the new structure. The best fitting model was then used to test for measurement invariance.

Both measures of relative and absolute fit were used, namely the relative $\chi^2$ (values close to 2 indicate close fit; Cronbach, 1951; Hoelter, 1983), Root Mean Square Error of Approximation (RMSEA, adequate fit requires values less than 0.05; Hu & Bentler, 1999), the Standardized Root Mean Residual (SRMR, good fit is indicated by values below 0.05; Hooper et al., 2008), the Tucker-Lewis Index (TLI, close fit is suggested by values higher than 0.95; Bentler & Bonett, 1980), and the Comparative Fit Index (CFI, values higher than 0.95 suggest close fit; Hu & Bentler, 1999). An oblique rotation (promax) was used as factors were expected to be correlated. The fit indices we report on were developed for continuous data (under Maximum Likelihood estimator), and research is ongoing for their cut-offs and general performance in ordinal / interval data under the WLSMV estimator (Li, 2015; Sass et al., 2014). As such, we present their values cautiously and treat this information as complementary to other criteria (i.e., internal consistency, content, stability, parallel analysis) for the selection of the number of factors to be retained.

The sample was randomly split in half using a random number generator. The two halves were used to test model structures through EFA and CFA. The number of factors to be retained was established through parallel analysis (Horn, 1965) and the Guttman-Kaiser criterion was considered, for which an eigenvalue above 1 suggests a factor to be retained (eigenvalues above one indicate a factor; Guttman, 1954; Kaiser, 1960). The software package within R studio, 'random.polychor.pa' for categorical data (Presaghi & Desimoni, 2019), was used for parallel analysis to compare the number of eigenvalues in the complete sample that were larger than those corresponding to 50 randomly computed samples (Liu & Rijmen, 2008). The results were displayed for comparison by creating a scree plot of the eigenvalues (Cattell, 1966).

A number of criteria were set for identifying a suitable factor structure namely (a) each factor has at least three items, (b) the factor loading for each item is at least 0.5, and (c)

there are no large cross loadings (i.e., loadings > 0.25) of items to more than one factor. Face and content validity of the suggested factors were also considered in the selection of the final model.

The multiple indicator multiple cause (MIMIC) model, under the WLSMV estimator for categorical data, was fit to assess potential measurement invariance due to gender and age in the items of the best fitting BESAA model (Jöreskog & Goldberger, 1975; Muthén, 1979). The MIMIC model allows for the items and the latent factors to be regressed onto one or more exogenous covariates to estimate the direct effect of such covariates. In the case of a significant direct effect there may be measurement non-invariance in the model; however, the effect can be considered negligible if it is small compared to the rate of endorsement on an item.

The fit of several existing models (factor structures) found in previous studies were tested in our data using CFA with the entire sample ($N$ = 472):

$M_1$: The original factor structure established with Canadian adolescents (Mendelson et al., 2001), which consists of three factors (Appearance, Weight, and Attribution) and 23 items.

$M_2$: The Italian adolescent factor structure (Confalonieri et al., 2008), which consists of three factors (BE-Appearance, BE-Weight, and BE-Attribution) and 14 items.

$M_3$: The Turkish adolescent factor structure (Arslan et al., 2020), which consists of three factors (BE-Appearance, BE-Weight, and BE-Attribution) and 15 items.

$M_4$: The gender-invariant Indian adolescent factor structure (Garbett et al., 2021), which consists of one factor and 7 items.

$M_{4g}$: The girls' version of the Indian adolescent factor structure (Garbett et al., 2021), which consists of three factors (Appearance-Positive, Appearance-Negative, and Weight) and 15 items (tested in the current sample of girls only).

$M_{4b}$: The boys' version of the Indian adolescent factor structure (Garbett et al., 2021), which consists of two factors (Appearance-Positive and Appearance-Negative) and 7 items (tested in the current sample of boys only).

To evaluate item stability, test re-test at item level was carried out using R studio (R Core Team, 2017). Two measures of agreement were considered: the Psi non-parametric concordance coefficent (Kuiper & Hoogenboezem, 2019) and the intraclass correlations coefficient (Shrout & Fleiss, 1979), for which values above 0.7 suggest reliability.

The internal consistency of the BESAA was evaluated with Cronbach's alpha coefficient (α; Cronbach, 1951), McDonald's (1999) Omega (ω), the value of alpha if item deleted (AID), and the item total correlation values (ITC; Nunnally & Bernstein, 1994). A reliable scale is indicative of alpha and Omega greater than 0.7, AID below the value of alpha, and ITC between 0.3 and 0.8.

Concurrent and convergent validity were assessed by estimating the correlations of the BESAA latent factors with two culturally validated scales, the PANAS-C8 and FRS. The total scores of the validation scales were included as exogenous variables in the CFA model and their correlations with each factor were estimated, accounting for measurement error.

Latent variable analysis was conducted using Mplus (Muthen & Muthén, 1998-2017), and SPSS version 25.0 (IMB Corp, Released 2017) was used for the rest of the analyses.

# 3. Results

## 3.1. Stability

The Psi coefficient for each item ranged from 0.72 to 0.80 and the ICC ranged from 0.83 to 0.86, indicating satisfactory test-retest reliability (Supplementary Material; Table S1). Thus, all items were considered reliable over time, and all items were retained for further analyses.

## 3.2. Factor Analysis

The original 3-factor solution ($M_1$) for the 23 items provided adequate fit to our data according to the incremental fit indices (TFI/CLI) and the absolute fit index of SRMR, but were less satisfactory with respect to other absolute, chi-squared based indices (RMSEA and rel $\chi^2$); see Table 2. The 14-item model structure from the Italian sample ($M_2$) and the 15-item Turkish model structure ($M_3$) also followed this pattern. The India gender non-specific structure ($M_4$) had an improved fit. The girls' structure found in India ($M_{4g}$) slightly improved, and close fit was achieved by the Indian boys' solution $M_{4b}$ in our boys sample. As expected, none of the models provided a good fit with our data. Both EFA and CFA were conducted subsequently to explore if a more satisfactory solution existed for this population, according to our data.

EFA was carried out on the first subsample ($n$ = 236). The sample correlation matrix produced three eigenvalues greater than 1 (12.034, 2.621 and 1.651). Therefore, according to the Kaiser-Guttman criterion, a three-factor model was suggested. Parallel analysis, however, suggested two factors (see scree plot in Figure 1.) The fit indices for both models, as well as the unidimensional model, are presented in Table 3.

The unidimensional model had a poor fit, and, while fit improved, the two-factor solution also had a less than adequate fit according to the model fit criteria. The three-factor model had an adequate fit to the data, but the pattern matrix also indicated five problematic items. These items were sequentially removed.

For the remaining 18 items, three eigenvalues above 1 emerged from the sample correlation matrix (9.116, 2.293, and 1.541), which indicated three factors could be extracted, according to the Kaiser-Guttman criterion. Parallel analysis suggested up to two factors could be extracted (see scree plot, Figure 2 in Supplementary Material). The model fit of the one-, two-, and three-factor solutions are presented in Table 3, with the one- and two- factor solutions not providing adequate fit.

The three-factor solution had a close fit to our data as measured by the relative and absolute fit indices. The content of the three factors was checked to ensure content validity of the EFA-derived subscales, interpreted as Appearance-Positive, Appearance-Negative, and Weight. The three-factor EFA-derived structure was then confirmed in the second subsample using CFA ($n$ = 239), where adequate fit was achieved (Table 3). The factor loadings derived by EFA and CFA of the BESAA's 18 items are shown in Table 4.

### 3.3. Measurement Invariance

Two items were measurement variant with respect to gender. For the same level of body esteem, boys had higher expected scores for Item 20 ("Minha aparência me ajuda a conseguir encontros românticos" / "My appearance helps me to get romantic dates") than girls by -0.24, and lower expected scores than girls on Item 2 ("As outras pessoas me consideram bonito(a)"/ "Other people consider me beautiful") by 0.25. As only two items were affected by gender and the contribution on the total scores was small; the non-invariance with respect to gender is considered negligible.

Measurement invariance due to age was also tested but found negligible in adolescence (more than 10 years of difference in age would be required for 1 point of change in the item's five-point score scale). Thus, the scale is considered invariant in terms of age, across the age range under study (i.e., 13 – 18 years).

### 3.4. Reliability

Internal consistency for all three factors of the 18-item BESAA was good (Appearance-Positive: $\alpha = 0.85$, $\omega = 0.85$; Appearance-Negative: $\alpha = 0.88$, $\omega = 0.86$; Weight: $\alpha = 0.89$, $\omega = 0.90$), as well as the overall total BESAA score ($\alpha = 0.92$). No problematic items were found in either Appearance-Positive or Appearance-Negative factors, as alpha did not increase by item deletion and item total correlations were within an acceptable range (Appearance-Positive: 0.38-0.70 and Appearance-Negative: 0.55-0.77). For the Weight

factor, high item total correlations were present (ITC per item: B04 = 0.58, B08 = 0.86, B10 = 0.85 and B16 = 0.80) and the deletion of B04 increased alpha to 0.93. The content of the four Weight items were reviewed, due to their high correlations. It was concluded that none of the items were redundant, and as such, all items were retained.

### 3.5. Validity

Validity was assessed by Pearson's correlation coefficients in a CFA model of factor scores. The three BESAA factors were not significantly correlated with age (Table 5). Evidence of concurrent and convergent validity was found by significant moderate, negative correlations between the FRS (i.e., body dissatisfaction) and the Appearance-Positive and Appearance-Negative subscales, and a significant strong negative correlation between the FRS and Weight subscale. The Positive Affect subscale of the PANAS-C8 was significantly correlated with all BESAA subscales, with moderate positive correlations between the PANAS-C8 and Appearance-Positive and Appearance-Negative subscales of the BESAA. The Negative Affect subscale of the PANAS-C8 was significantly negatively correlated with all three BESAA subscales, with a moderate negative correlation with the Appearance-Negative subscale of the BESAA and low to moderate correlations with Appearance-Positive and Weight subscales of the BESAA (Table 5). The direction of all significant correlations was as predicted, indicating the concurrent and convergent validity of the BESAA.

## 4. Discussion

Growing evidence suggests that body image concerns are prevalent among Brazilian adolescents (e.g., Leal et al., 2020). However, until now, there have been no robustly validated holistic body image measures for use among this population. The present study aimed to address this gap by culturally adapting, translating, and examining the psychometric properties of the Body Esteem Scale for Adults and Adolescents (BESAA; Mendelson et al., 2001) among Brazilian adolescents aged 13-18 years old. Factor structure, reliability, and

validity found a psychometrically sound three-factor solution (Appearance-Positive: 8 items; Appearance-Negative: 6 items; and Weight: 4 items), totalling 18 items, which is largely invariant across gender and totally invariant across the 13-18 age range. The BESAA subscales are further supported by good-to-excellent internal consistency (Cronbach's alpha ranging from .85 to .89) and strong test-retest reliability over 7-20 days.

Regarding factorial validity, as predicted, the present data did not fit with any existing models (i.e., validated models among Canadian, Italian, Turkish, and Indian adolescents). Instead, a three-factor solution derived from EFA and verified by CFA provided best fit among Brazilian adolescents. The findings support our hypothesis that previous models would not provide a good fit to our data and confirm that researchers should adopt a bottom-up approach when validating a measure in a new cultural or linguistic context. In the present study, three factors were identified: Appearance-Positive, Appearance-Negative, and Weight. These subscales mirror those derived by Garbett et al (2021) in an Indian adolescent population. Why this is the case is unknown. A potential explanation might be that popular conceptualisation of body image has shifted over the last three decades. Since the development of the BESAA in the late 1990s, mounting evidence demonstrates negative and positive body image to be distinct constructs and not two ends of a body image continuum as previously thought (Webb et al., 2015). The BESAA was originally developed to be a holistic measure of body image, inclusive of positive and negative appearance evaluation. It may be that these positive and negative aspects of body image are even more pronounced within a Brazilian sample, as hypothesised by Garbett et al. (2021) among an Indian adolescent sample. Brazilian youths tend to overvalue their bodies, which must be in conformity with certain aesthetic standards (Goldenberg, 2010). The body usually plays a fundamental role in people's lives to achieve social ascension and develop successful relationships. Also, many Brazilians adopt body change behaviours to try and conform with the standard of beauty. For

instance, Brazil's consumption of diet pills is one of the highest globally, in addition to being known as the cosmetic surgery capital of the world, with 2.5 million surgical and non-surgical aesthetic procedures conducted annually (ISAPS, 2019).

From EFA, five items were identified as problematic due to low loadings or cross loadings and were omitted from the final scale. For example, Item 18 ("Quando me peso, fico deprimido [triste]"/ "When I weigh myself, I get depressed [I get sad]") cross loaded onto the Appearance-Negative and Weight subscales. This makes conceptual sense as the item refers to negative emotions about the body and also references weight. A further two items (Item 3: "Eu tenho orgulho do meu corpo"/ "I'm proud of my body", and Item 22: "Eu acho que tenho um bom corpo"/ "I think I have a good body") cross loaded onto the Appearance-Positive and Weight subscales. This is a shared finding, also observed in Turkish (Arslan, 2020) and Indian (Garbett et al., 2021) adolescent populations. The phrases "proud of my body" and "good body" could reflect feelings of gratitude for the body and what it can do, tapping into elements of positive body image, which is well known to be a construct separate from negative body image (Tylka & Wood-Barcalow, 2015). Positive body image research emerged from high-income countries (i.e., Australia, U.S, Western Europe) and is still in its infancy in LMICs such as Brazil. Therefore, it is unknown if aspects of positive body image are too abstract to Brazilian adolescents in the way they are currently conceptualised and researched or whether positive evaluations of appearance (i.e., respect, gratitude, appreciation) are more complex in the Brazilian context. Given that these items perform problematically elsewhere, it could also reflect cross-linguistic differences in the understandings and meanings of these items among adolescents.

In addition, minor gender differences were found on two items. Firstly, for the same level of body esteem, girls scored lower than boys on Item 20 ("Minha aparência me ajuda a conseguir encontros românticos"/ "My appearance helps me to get romantic dates"). This

difference might relate to gender norms in Brazil, as “getting romantic dates” may be experienced differently depending on gender. Also, not only in Brazil, boys tend to have higher body appreciation (He et al., 2020), which can positively influence their engagement in relationships with family, friends, and romantic dates. Secondly, scores for Item 2 (“As outras pessoas me consideram bonito(a)”/“Other people consider me beautiful”) also displayed relative differences across gender, with girls scoring higher than boys. Why this is the case is unknown, as cognitive interviews with Brazilian adolescents did not identify any gender differences in the endorsement or understanding of the word “bonito(a)”/“beautiful.” However, adolescents report that they struggle to know what other people think of them, although this result was not strongly gendered.

As predicted, body esteem was negatively associated with body dissatisfaction, demonstrating good concurrent validity. At the subscale level, the strongest correlation was found between body dissatisfaction and the Weight subscale of the BESAA, with moderate correlations between body dissatisfaction and the Appearance-Positive and Appearance-Negative subscales. This is unsurprising given that the FRS used to measure body dissatisfaction is primarily a measure of weight and shape, not general appearance (Ferreira et al., 2020). The Weight subscale in particular will be a useful tool to measure weight esteem in future research given that weight concerns are salient among this population (Moehlecke et al., 2020). With regard to convergent validity, unsurprisingly the strongest correlations were observed between the Negative Affect subscale of the PANAS-C8 and the Appearance-Negative subscale of the BESAA, and between the Positive Affect subscale of the PANAS-C8 and the Appearance-Positive subscale.

The findings should be in interpreted in light of its limitations. The present study included a test re-test period from 7 to 20 days. Whilst this range might be considered a limitation, anywhere between one week and 30 days is deemed an appropriate interval

between timepoints to assess measurement stability (Polit, 2014; Streiner et al., 2015). The sample of adolescents was geographically diverse with representation from 24 out of 27 Brazilian states, but adolescents were recruited through a research agency consisting of panellists with a middle-to-high socioeconomic status (e.g., A – C in Brazil; Nes, 2016), potentially introducing a sampling bias. Therefore, the sample does not necessarily represent the entirety of the diverse adolescent population within Brazil, and further research would be required to determine how the BESAA would perform among adolescents from lower socioeconomic groups. Moreover, due to the online nature of our study because of the COVID-19 pandemic, adolescents from rural parts of Brazil, where the internet is not easily accessible, may have been inadvertently excluded. As has been documented elsewhere among high-income countries (van der Waerden et al., 2010), the present findings suggest it might also be difficult to engage individuals from lower socioeconomic groups in research with LMICs. Future research should make efforts to recruit inclusively, ensuring diverse and representative samples, particularly when conducting measures validation. This will ensure the measure is relevant to those across the target audience.

Although the current study's aim was to validate the BESAA among an adolescent sample, future research might look to explore a validation of this scale among adults (i.e., ≥18 years) to aid the measurement of body image across the lifespan. Body image concerns are prevalent beyond adolescence, with increasing rates among women and men (Silva et al., 2011). As with the adolescent measures, many existing body image measures for adults assess specific components of body image (e.g., dissatisfaction with body weight or body shape). Therefore, a holistic body image measure for use among adults would also be a valuable contribution to the field. Similarly, as a growing proportion of Brazilian adolescents identify as non-binary or transgender (Martin-Story et al., 2021), separate research could also look to explore the BESAA among this population. The Brazilian Portuguese version of

BESAA and its subscales might also aid researchers who wish to examine body image longitudinally from early adolescence into adulthood to identify key stages where body image concerns peak and to inform prevention and intervention efforts to target these. Equally, the availability of the BESAA and its holistic framing of appearance opens up possibilities for a deeper understanding of the modifiable risk factors for body image in Brazil to further future prevention and intervention efforts.

In sum, the Brazilian Portuguese version of the BESAA shows evidence of being a reliable and psychometrically sound measure of body image among adolescent girls and boys aged 13 to 18 years. This is the first study to adapt and robustly validate a holistic measure of body image among adolescents in Brazil. A three-factor, 18-item measure and its subscales were found to be largely gender invariant, and invariant across age, and therefore can be recommended for use among Brazilian adolescents. The availability of the BESAA in Brazilian Portuguese will be particularly useful for researchers, interventionists, and clinicians who wish to assess body image concerns more broadly or develop and evaluate body image interventions among adolescents. It may also contribute to a more comprehensive understanding of body image among this population. The authors hope that this tool will not only facilitate further research to examine the role of body image in Brazil but also encourage researchers to appropriately validate existing body image measures that can be administered in different cultural contexts, including other Portuguese-speaking countries.

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**Table 1.**

*Participant Demographic Characteristics*

| Variable | Statistic |
|---|---|
| Age | |
| *M (SD)* | 15.35 (1.73) |
| Gender *(n, %)* | |
| Girl | 239 (50.3%) |
| Boy | 236 (49.7%) |
| Ethnicity (*n, %)* | |
| Asian | 1 (0.2%) |
| Black | 33 (6.9%) |
| Indigenous | 3 (0.6%) |
| Mixed-race | 144 (30.3%) |
| White | 294 (61.9%) |

**Table 2.**

*Goodness of Fit Indices from Confirmatory Factor Analysis for the Original Factor Solution, the Solutions Identified from Italy, Turkey and India*

| Model | | REL $\chi^2$ | RMSEA (90% CI) | CFI | TLI | SRMR |
|---|---|---|---|---|---|---|
| Original | $M_1$ | 8.678 | 0.127 (<0.001) | 0.926 | 0.917 | 0.076 |
| Italy | $M_2$ | 8.260 | 0.124 (<0.001) | 0.963 | 0.955 | 0.056 |
| Turkey | $M_3$ | 8.260 | 0.124 (<0.001) | 0.963 | 0.955 | 0.056 |
| India | $M_4$ | 9.435 | 0.133 (<0.001) | 0.984 | 0.974 | 0.026 |
| India (girls) | $M_{4g}$ | 5.482 | 0.137 (<0.001) | 0.953 | 0.943 | 0.056 |
| India (boys) | $M_{4b}$ | 2.669 | 0.084 (0.047) | 0.994 | 0.991 | 0.023 |

Note. CI = Confident Interval; CFI = Comparative Fit Index; REL $\chi^2$= relative chi-square; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Residual; TLI = Tucker-Lewis Index.

**Table 3.**

*Goodness of Fit Indices from Factor Analysis of the BESAA 23- and 18-Item Scales*

| Sample (half) | Items | REL $\chi^2$ | RMSEA (90% CI) | CFI | TLI | SRMR |
|---|---|---|---|---|---|---|
| EFA 1-factor | 23 | 6.578 | 0.154 (0.146-0.161) | 0.908 | 0.898 | 0.125 |
| EFA 2-factors | 23 | 5.990 | 0.145 (0.138-0.153) | 0.925 | 0.908 | 0.081 |
| EFA 3-factors | 23 | 1.985 | 0.065 (0.55-0.074) | 0.987 | 0.982 | 0.034 |
| | | | | | | |
| EFA 1-factor | 18 | 9.335 | 0.188 (<0.001) | 0.888 | 0.873 | 0.144 |
| EFA 2-factors | 18 | 6.234 | 0.149 (<0.001) | 0.939 | 0.921 | 0.096 |
| EFA 3-factors | 18 | 2.044 | 0.067 (0.019) | 0.989 | 0.984 | 0.032 |
| CFA 3-factors | 18 | 3.192 | 0.096 (<0.001) | 0.960 | 0.954 | 0.060 |

*Note.* Exploratory Factor Analysis, *n* = 162; Confirmatory Factor Analysis, *n = 161;* CFI = Comparative Fit Index; REL $\chi^2$= relative chi-square*;* RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Residual; TLI = Tucker-Lewis Index.

**Table 4.**

*Factor Loadings for the 18-Item BESAA from Exploratory Factor Analysis and Confirmatory Factor Analysis*

| Item | Item labels (English) | Item labels (Brazilian Portuguese) | Appearance -Positive | Appearance -Negative | Weight |
|---|---|---|---|---|---|
| 20 | My appearance helps me to get romantic dates | Minha aparência me ajuda a conseguir encontros românticos | 0.75 (0.53) | | |
| 02 | Other people consider me beautiful/good-looking | As outras pessoas me consideram bonito(a) | 0.75 (0.50) | | |
| 12 | People my own age like my appearance/how I look | As pessoas da minha idade gostam da minha aparência | 0.70 (0.73) | | |
| 01 | I like how I look in photos | Eu gosto da minha aparência nas fotos | 0.68 (0.68) | | |
| 05 | I think my appearance would help me get a job | Eu acho que a minha aparência me ajudaria a conseguir um trabalho | 0.60 (0.35) | | |
| 23 | I'm as beautiful/good-looking as I would like to be | Eu sou tão bonito(a) quanto gostaria de ser | 0.60 (0.82) | | |
| 14 | I'm as beautiful/good-looking as most people | Eu sou tão bonito(a) quanto a maioria das pessoas | 0.59 (0.67) | | |

| | | | | | |
|---|---|---|---|---|---|
| 06 | I like what I see when I look in the mirror | Eu gosto do que vejo quando me olho no espelho | 0.54 (0.89) | | |
| 13 | My appearance makes me sad | Minha aparência me deixa triste | | 0.92 (0.91) | |
| 21 | I get distressed about my appearance | Eu fico angustiado(a) com minha aparência | | 0.89 (0.90) | |
| 17 | I feel ashamed of my appearance | Eu sinto vergonha da minha aparência | | 0.86 (0.90) | |
| 11 | I would like to look like someone else | Eu desejaria ter a aparência de outra pessoa | | 0.82 (0.66) | |
| 07 | I would change lots of things about my appearance, if I could | Eu mudaria muitas coisas na minha aparência, se eu pudesse | | 0.62 (0.71) | |
| 09 | I would like to be more beautiful/good-looking | Eu gostaria de ser mais bonito(a) | | 0.55 (0.64) | |
| 10 | I really like how much I weigh | Eu realmente gosto de quanto eu peso | | | 0.94 (0.95) |
| 08 | I am satisfied (happy) with my weight | Eu estou satisfeito(a) (feliz) com meu peso | | | 0.91 (0.96) |
| 16 | I have the right weight for my height | Eu sinto que tenho o peso certo para a minha altura | | | 0.85 (0.87) |

| | | | |
|---|---|---|---|
| 04 | I am preoccupied with trying to change my body weight | Estou preocupado(a) em tentar mudar meu peso corporal | 0.67 (0.69) |

*Note.* Standardised loadings under promax rotation. Exploratory Factor Analysis, $n$=236, and Confirmatory Factor Analysis (in parentheses), $n$=239.

**Table 5.**

*Pearson's Correlation Coefficients Between the 18-Item BESAA and the Figure Rating Scale and the PANAS-C8.*

| **Measure** | **Appearance-Positive** | **Appearance-Negative** | **Weight** |
|---|---|---|---|
| Age | 0.058 | -0.062 | -0.068 |
| Figure Rating Scale | -0.416* | -0.458* | -0.634* |
| PANAS-C8 Positive subscale | 0.611* | 0.457* | 0.356* |
| PANAS-C8 Negative subscale | -0.361* | -0.475* | -0.339* |

*Note.* PANAS-C8 is the Positive and Negative Affective Schedule for Children. *$p<0.001$

## Appendix

Table A1.

*Regions participants reside in within Brazil.*

| **Region** | **Frequency (*n*)** | **Percent (%)** |
|---|---|---|
| Alagoas | 1 | 0.2 |
| Amazonas | 10 | 2.1 |
| Amapá | 3 | 0.6 |
| Bahia | 22 | 4.6 |
| Ceará | 12 | 2.5 |
| Distrito Federal | 11 | 2.3 |
| Espírito Santo | 13 | 2.7 |
| Goiás | 9 | 1.9 |
| Maranhão | 6 | 1.3 |
| Mato Grosso | 7 | 1.5 |
| Mato Grosso do Sul | 3 | 0.6 |
| Minas Gerais | 34 | 7.2 |
| Pará | 10 | 2.1 |
| Paraíba | 9 | 1.9 |
| Paraná | 33 | 6.9 |
| Piauí | 5 | 1.1 |
| Pernambuco | 22 | 4.6 |
| Rio Grande do Norte | 3 | 0.6 |
| Rio Grande do Sul | 34 | 7.2 |
| Rio de Janerio | 48 | 10.1 |

| | | |
|---|---|---|
| Rondônia | 6 | 1.3 |
| São Paulo | 147 | 30.9 |
| Santa Catarina | 21 | 4.4 |
| Sergipe | 1 | 0.2 |
| Missing data | 5 | 1.1 |