Validation and invariance across gender of the Beliefs About Appearance Scale (BAAS) in a community sample of heterosexual adults in a committed relationship

Estudo de validação e invariância de gênero da Escala de Crenças Acerca da Aparência Corporal numa amostra da comunidade de adultos heterossexuais num relacionamento comprometido

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Abstract

Objective: To evaluate the psychometric properties of the Beliefs About Appearance Scale (BAAS) in terms of its factorial structure and invariance, reliability, and validity when applied to adults from the community.

Methods: Participants consisted of 810 heterosexual Portuguese individuals in a committed relationship. As a confirmatory factor analysis did not support the original structure of the BAAS, an exploratory factor analysis was performed.

Results: A 12-item version was extracted comprising two dimensions: one personal and the other social. The factorial model depicting this bidimensional structure revealed an adequate fit following confirmatory factor analysis. Multigroup confirmatory factor analyses indicated invariance across gender. Concurrent and discriminant validities and internal consistency were estimated and observed to be adequate.

Conclusions: This shorter measure of the BAAS can accurately assess body appearance beliefs and may be used in different research settings and contexts.

Keywords: Body appearance, beliefs, validation, factor analyses, multigroup analysis.

Resumo

Objetivo: Avaliar as propriedades psicométricas da Beliefs About Appearance Scale (BAAS), nomeadamente sua estrutura fatorial e invariância, fidelidade e validade quando aplicada a adultos de uma amostra comunitária.

Métodos: Participaram 810 heterossexuais portugueses envolvidos numa relação de compromisso. Uma vez que a análise fatorial confirmatória não apoiou a estrutura original da escala, conduziu-se uma análise exploratória.

Resultados: Extraiu-se uma versão da escala com 12 itens, que integra duas dimensões: uma pessoal e outra social. O modelo fatorial composto por esta estrutura bidimensional revelou um ajustamento adequado aos dados, após a análise fatorial confirmatória. A análise confirmatória multigrupos indicou invariância entre os gêneros. A validade concorrente e discriminante e a consistência interna foram estimadas e apresentaram valores adequados.

Conclusões: A versão final, com 12 itens, da BAAS avalia com acuidade as crenças acerca da aparência corporal e pode ser utilizada em diferentes contextos de investigação.

Descritores: Aparência corporal, crenças, validação, análise fatorial, análise multigrupos.

Introduction

Body image is a multidimensional construct, the definition of which is commonly accepted as referring to the perceptions, attitudes and individual experiences of one's own body, more specifically body appearance.[1]

The cognitive behavioral conceptual approach postulates that dysfunctional attitudes and beliefs are at the core of disordered behavior.[2] In line with this perspective, a strong body of research has demonstrated that dysfunctional body appearance beliefs and high levels of body appearance concerns have a negative impact on the development, maintenance of and recovery from eating disorders. Thus, the existing measures used in this body of research focus on different dimensions of body image related to disordered eating (e.g., negative appreciation of body size on the Body Attitudes Test [BAT]).[3] The mechanisms underlying the association between body appearance beliefs/concerns and different psychopathologies remain unclear. Nonetheless, some evidence points to dysfunctional appearance beliefs, negative attitudes and a high level of concern about appearance being linked to higher levels of body dissatisfaction which, in turn, is adversely related to women's and possibly men's psychosocial functioning and quality of life.[4] Research and theory seem to indicate that body appearance dysfunctional beliefs may be an important transdiagnostic dimension at the core of risk and maintenance factors for different disorders (e.g., social appearance anxiety, sexual dysfunction)[5,6] and are associated with poorer psychological well-being in people presenting with disease or treatment that compromise their appearance (e.g., ptosis).[7]

Our review of the existing measures revealed that the Beliefs About Appearance Scale (BAAS) focuses exclusively on rigid conditional and unconditional beliefs about self-worth based on appearance and may therefore be more flexible to be used in diverse research contexts beyond eating disorders. Moreover, in comparison with existing measures, such as the Appearance Schemas Inventory-Revised Version (ASI-R),[8] it presents the advantage of not being dependent on the experience of schema activation to detect underlying beliefs about appearance.

The BAAS is a 20-item scale designed to assess dysfunctional beliefs regarding appearance. It was developed within the scope of cognitive behavioral explanatory models of eating disorders in order to fulfill the need to have a measure to assess underlying cognitive structures to explain eating disorders. The authors recognized that "... once formed, appearance beliefs influence how a person generates, attends to, processes, and recalls appearance-related information"[9] (p. 814). Consequently, appearance beliefs are measured using items that underlie the desire to restrict eating, criticize the body, and focus on appearance related-stimuli, factors common to other disorders, beyond eating disorders. The items are related to a broad scope of areas for body appearance endorsement (interpersonal, work/achievement, self-image, and emotions/feelings) that may be useful for testing etiological and maintenance cognitive models of psychopathology. The original validation process revealed a measure with a valid single-factor structure confirmed in three distinct samples and in both men and women, with good reliability ($a = 0.94$; $a = 0.95$; $a = 0.96$) and good test-retest reliability ($r = 0.73$ over 10 months and $r = 0.83$ over 3 weeks). As for discriminant validity, it proved to be uncorrelated with body mass index (BMI) ($r = 0.10$ and -0.11 in samples 2 and 3, respectively), and with all the subscales of the Multidimensional Body-Self Relations Questionnaire (MBSRQ) that were related to body weight and investment in physical health or athletics ($r < -0.1$ in all subscales) and proved to have good concurrent validity with the remaining subscales of the MBSRQ that are linked to appearance and body satisfaction ($r > 0.44$ in all subscales). Finally, it proved to have predictive validity over time with the Eating Disorders Examination Questionnaire.[9] A single-factor structure was found in a Turkish validation study of the BAAS with a sample of 274 university students.[10]

In the BAAS, participants are asked to rate their agreement with statements about body appearance using a 5-point Likert scale ranging from 0 (I disagree) to 4 (I totally agree), with higher scores indicating higher dysfunctional attitudes regarding appearance.

The aim of the study was to adapt, validate and study the invariance across gender of the BAAS in a community sample of heterosexual adults.

Method

Participants

There were 810 Portuguese participants, with a mean age of 29.58 years (standard deviation [SD] = 10.10; median [Md] = 26; range: 18 to 88 years); 313 were men (39%). All participants were heterosexuals in a committed relationship: 531 were in a non-cohabiting committed relationship (65.6%) and 278 were married or living in common-law relationships (34.4%). The majority of participants had graduated from university (n = 583, 72.2%).

Data were collected in two occasions, and therefore two samples were established for analysis. Sample A had 423 participants (128 men; mean age = 27.55; SD = 9.36; Md = 24; range: 18 to 68 years). As far as their

relationship status, there were 310 people (73%) in a non-cohabiting committed relationship and 113 (27%) married or living in common-law relationships, and most had a university degree (n = 297, 69.7 %). Sample B had 387 participants (185 men; mean age = 31.80; SD = 10. 42; Md = 29; range: 18 to 88 years). In terms of relationship status, there were 222 people (57%) in a non-cohabiting committed relationship and 165 (43%) married or living in common-law relationships. Also in sample B, the majority of the participants had graduated from university (n = 285; 72.8%).

Procedures

In order to establish linguistic equivalence, the scale was translated separately from English to Portuguese by two individuals fluent in English and Portuguese with a degree in psychology; based on these translations, two other psychologists created a single Portuguese version that was back-translated into English by a bilingual psychologist; the two versions (the original and the one resulting from the back-translation) were compared and were deemed similar, i.e., the meaning of each item was considered to have been maintained.[11] In order to test for cultural validation, we pre-tested the Portuguese version with 15 people. These evaluators were students (n = 7) or academics (n = 4) in the field of psychology with a good knowledge of the Portuguese language. We also asked four lay people aged 25, 33, 45 and 68 years, respectively, to read the items and comment on their understanding of the items' meaning. All evaluators reported that the items were clear and easy to understand.

After approval by the ethics committees of the institutions involved, an online study was publicly launched and information regarding its purposes was provided via email and posts on social networks. The sampling method was non-probabilistic, and the final sample was a convenience sample, collected online through advertising and URL sharing, a method similar to snowball sampling. Participants had access to the consent URL webpage where information regarding aims and criteria to be included in the study could be found. Inclusion criteria included being above the age of consent of 18, being heterosexual and in an exclusive committed relationship, and being a Portuguese citizen. Participants were assured that no personal data would be recorded, and confidentiality and anonymity were guaranteed. Data were collected online during 8 months.

Measures

General questionnaire. The survey included a sociodemographic questionnaire (e.g., gender, age,

relationship status, education) and self-reported weight and height, enabling calculation of the participants' BMI.

Beliefs About Appearance Scale (BAAS).[9] The BAAS is a 20-item measure developed to evaluate beliefs about appearance. It was described in detail above (Introduction) as its validation is the focus of the present study.

General Body Dissatisfaction Scale (GBD).[3]. The GBD is a four-item subscale of the BAT and evaluates body dissatisfaction based on the frequency of negative perceptions, behaviors, and feelings about one's own body. Participants rate their answers on a 6-point Likert-type scale (ranging from 1 - never to 6 - always). Total score may range between 4 and 24 points, with higher scores representing higher levels of body dissatisfaction. This subscale presented a Cronbach's alpha of 0.82, an average inter-item correlation (AIIC) of 0.52 in previous Portuguese studies,[12] and a Cronbach's alpha of 0.88 in the current study.

Body Esteem Scale (BES).[13] The original scale consists of 35 items set out to assess specific components of body esteem. Participants are positioned relatively to each item on a Likert scale ranging from 1 to 5, where 1 stands for "have strong negative feelings" and 5 for "have strong positive feelings." Higher scores indicate higher body esteem. The scale revealed good psychometric properties for the assessment of body esteem in adolescents and young adults.[12] The Portuguese version[14] was used, with a total of 23 items integrated in three factors, namely weight concern (BES 1), physical attractiveness (BES 2), and sexuality (BES 3), which were common and invariant across gender, presenting total scores ranging from 12 to 60. Therefore, in the version used, the names of the subscales were similar for both men and women, unlike the original BES study. In the current study, each subscale had a Cronbach's alpha above 0.72.

Data analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 21, while factorial studies were tested using AMOS version 21.

First, a confirmatory factor analysis (CFA) using the maximum likelihood estimation method was performed to test whether the one-dimensional structure proposed by the BAAS authors revealed an adequate fit. This solution was compared to two additional factorial models, namely a four-factor structure (interpersonal, work/achievement, self-image, and feelings/emotions factors) and a second-order solution. All parameters were estimated by bootstrapping generated from 1,000 samples.

Model adjustment was assessed by examining several goodness of fit indices, such as chi-square/degrees of freedom (χ^2/df), the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Models were considered to have adequate fit when CFI and TLI values were close to (or above) 0.90,[15] and when RMSEA and SRMR values were below .08.[16] The model comparison also took into account the Bayesian information criteria (BIC) and the Akaike information criteria (AIC), with lower values suggesting a more parsimonious solution,[17,18] and a chi-square difference test.[19]

The first set of CFAs revealed the need to further examine the underlying structure of the BAAS scale.

Equivalence between samples A and B was performed and the chi-square and independent t-tests were used to compare categorical (gender, educational level, relationship status) and continuous (age) variables, respectively.

Hence, an exploratory factor analysis (EFA) was conducted with approximately half of the sample (n = 423, sample A). First, a principal components method of factor extraction without rotation was used as an a priori criterion given the one-dimensional structure of the original BAAS version, followed by an extraction solution using varimax rotation. An iterative strategy was used with the exclusion of the poorest items (cross-loadings above 0.40 in two components), with a subsequent re-run of the factor analyses, until all remaining items were in line with a combination of four criteria: 1) Kaiser-Meyer-Olkin (KMO) value above 0.70; 2) item communalities cut-off above 0.40; and 3) exclusion of items with cross-loadings above 0.40 in two or more factors with a difference lower than 0.40; plus 4) retention of factors with eigenvalues above 1 in conjunction with the scree plot for varimax rotation.[20]

Following the EFA extraction results, a second set of CFAs was carried out with the other half of the sample (n = 387, sample B). Three factorial models were estimated: a single-factor solution (M1), a bidimensional structure (M2) and a second-order model (M3). The model fits were assessed by examining the previously mentioned goodness of fit indices. In addition, a series of multigroup CFA nested models were evaluated to test if the factorial solution with the best fit performed equally across gender. Different levels of measurement invariance were tested (configural, metric, scalar, and strict). First, a model without equality constraints was tested (configural model) to freely estimate parameters across women and men. Then, metric invariance was assessed by constraining factor loadings, followed by scalar invariance with additional constraints being

submitted to the intercepts of the observed variables, and ending with strict invariance that required another set of constraints applied to factorial residual variances. These nested models were compared against each other using the Satorra-Bentler (S-B) scaled chi-square test.[21] Factorial invariance is supported when the S-B chi-square difference ($\Delta\chi^2$) test between models is non-significant, suggesting that the factorial structure is similar across groups. Mean differences between genders were analyzed by means of a t-test for independent samples.

Reliability was examined by an internal consistency coefficient (Cronbach's alpha), with values between 0.60 and 0.70 indicating acceptable reliability and values equal (or above) 0.70 illustrating a good level of reliability.[22]

Concurrent and discriminant validity were assessed by correlating the final solution of the BAAS found in the present study with measures of body dissatisfaction (GBD), body esteem subscales (BES 1, 2 and 3), and BMI. For concurrent validity, positive correlations were expected with the GBD, and negative correlations with the BES. For discriminant validity, no correlation with BMI was expected. Finally, the predictive value of the final solution of the BAAS was inspected through linear regressions with GBD, BES, and BMI as criterion variables.

Results

Item analysis

The descriptive characteristics of the BAAS revealed good psychometric sensitivity for the 20 BAAS items (Table 1), and the range of means (0.35-1.56) showed less than moderate agreement with its dysfunctional beliefs.

Confirmatory factor analysis (CFA)

The factorial validity test of the measurement model proposed by the authors revealed that the original one-dimensional structure did not fit the data well ($\chi^2_{[170]}$ = 2180.66, χ^2/df = 12.83, AIC = 2260.66, BIC = 2448.55, CFI = 0.76, TLI = 0.75, RMSEA= 0.121, 90% confidence interval [90%CI] 0.116-0.125, SRMR = 0.08). Two other models were tested, a four-factor model ($\chi^2_{[164]}$ = 1638.74, χ^2/df = 9.99, AIC = 1730.74, BIC = 1946.8, CFI = 0.76, TLI = 0.81, RMSEA= 0.105, 90%CI 0.101-0.110, SRMR = 0.066), and a second-order model comprising four first-order factors ($\chi^2_{[166]}$ = 1751.25, χ^2/df = 10.55, AIC = 1839.25, BIC = 2045.92, CFI = 0.82, TLI = 0.80, RMSEA= 0.109, 90%CI 0.104-0.113, SRMR = 0.072). None revealed an acceptable fit.

Exploratory factor analyses (EFA)

Both samples were similar in terms of education ($\chi^2_{[1]}$ = 0.76, p = 0.38). In sample B. participants were slightly older ($F_{[1,808]}$ = 9.2, p < .01), with more men and fewer women (χ^2 = 26.23, p < 0.001), and more participants married or living in common-law relationships ($\chi^2_{[1]}$ = 23, p < 0.001) than in sample A.

The underlying structure of the scale with no rotation method revealed a KMO of 0.92, showing that the set of items was suitable for factor analysis. All items' communality was above 0.40, and four components were found, explaining a total variance of 65.27%. In the first solution, nine items (1, 2, 3, 4, 5, 6, 9, 11, 14) were excluded, and in the second, three (7, 8, 10), due to cross-loadings above .40 in two or more components. The single-factor structure obtained comprised eight items with loadings above 0.50, an eigenvalue of 5.0 and an explained total variance of 63%. Thus, this solution made it possible to retain only 40% of the original scale items, showing that factor loadings were not identifiable as four separate factors, and the items retained reflected merely two of the four broad scope areas of body appearance at the root of the scale construction, i.e., self-image and feelings/emotions. Thereby, an EFA with varimax rotation was performed in order to help clarify the underlying structure of the data.

Two solutions, by means of varimax rotation, were run before the final solution was obtained. In the first

Table 1 - Mean (standard deviation), skewness, and kurtosis of the original 20 BAAS items (n = 810)

Items	Mean (SD)	Skewness	Kurtosis
1. The opinion others have of me is based on my appearance.*	1.32 (1.02)	0.31	-0.69
2. The amount of influence I have on other people depends upon how I look.*	1.13 (1.03)	0.63	-0.41
3. People will think less of me if I don't look my best.*	0.84 (.93)	1.00	0.45
4. People would be more interested in me if I looked better.	1.19 (1.19)	0.75	-0.43
5. My relationships would improve if I looked the way I wished.	0.90 (1.12)	1.13	0.39
6. The amount of success I have in my (future) job or career depends largely upon how I look.*	1.14 (1.00)	0.58	-0.37
7. My appearance influences my ability to do things.	0.92 (1.08)	0.99	0.07
8. My performance in activities (e.g., school, work, hobbies) is influenced by how I look.	0.71 (.93)	1.26	0.93
9. The opportunities that are available to me depend upon how I look.*	1.01 (1.01)	0.85	0.18
10. My school and/or work performance or opportunities would improve if I looked the way I wished.	0.52 (.89)	1.91	3.40
11. My value as a person depends upon how I look.	0.35 (.71)	2.20	4.50
12. How I feel about myself is largely based on my appearance.*	1.56 (1.14)	0.35	-0.72
13. I would think more highly of myself if I looked the way I wished.	1.10 (1.22)	0.87	-0.31
14. How I look is a large part of who I am.*	1.38 (1.12)	0.53	-0.46
15. It is difficult to feel good about myself when I am not looking my best.*	1.46 (1.21)	0.47	-0.77
16. My ability to feel happy depends upon how I look.*	1.29 (1.08)	0.44	-0.65
17. Improving my appearance is one of the few activities that make me feel good or as if I am accomplishing something.*	0.73 (.98)	1.31	1.08
18. My life would be more exciting or rewarding if I looked good.*	1.03 (1.11)	0.90	-0.02
19. My moods are influenced by how I look.*	1.09 (1.14)	0.86	-0.12
20. I would enjoy life more if I looked the way I wished.	0.99 (1.18)	1.09	0.24

BAAS = Beliefs About Appearance Scale; SD = standard deviation; Se$_{sk}$ = standard error for skewness; Se$_{ku}$ = standard error for kurtosis.
Se$_{sk}$ = 0.09, Se$_{ku}$ = 0.17.
Broad scope areas of items: interpersonal (1, 2, 3, 4, 5), work/achievement (6, 7, 8, 9, 10), self-image (11, 12, 13, 14, 15), and feelings/emotions (16, 17, 18, 19, 20).
* Items retained in the final version of the BAAS in the current study.

(items 4, 7, 8, 10, 13, 20) and second (items 5, 11) solutions, the items in brackets were removed given their cross-loadings above 0.40 in two or more factors. Examination of the eigenvalues and scree plot for the final solution indicated a two-factor structure, with 12 items retained, seven for factor 1 and five for factor 2, with loadings above 0.50, eigenvalues of 5.5 and 1.7, explaining 60.26% of the total variance (Table 2). The retained items mirrored the four areas from which the BAAS was developed: interpersonal (items 1, 2, 3), and work/achievement (6, 9) in factor 2, and self-image (12, 14, 15) and feelings/emotions (16, 17, 18, 19) in factor 1. Therefore, factor 1 was interpreted as mirroring the belief about the implications of appearance in the personal domain, and factor 2 in the social domain. Total values ranged from 0 to 28 in factor 1 and from 0 to 20 in factor 2, with higher scores indicating greater levels of dysfunctional beliefs about the implications of appearance in personal and social domains.

Second CFA

First, a single-factor model (M1) was specified fixing the variance to 1, with the contribution of the 12 items. The single-factor measurement model presented an unacceptable fit ($\chi^2_{[54]}$ = 360.47, χ^2/df = 6.68, CFI = 0.86, TLI = 0.85, RMSEA= 0.12, 90%CI 0.11-0.13, SRMR = 0.07, AIC = 408.47, BIC = 503.47). Then, the bidimensional structure was tested, fixing the variance of both factors to 1, and presented a good fit ($\chi^2_{[53]}$ = 192.01, χ^2/df = 3.62, CFI = 0.94, TLI = 0.92, RMSEA= 0.08, 90%CI 0.07-0.10, SRMR = 0.05, AIC = 242.01, BIC = 340.97) (Figure 1). Finally, a second-order model

with the two factors nested was specified by fixing the second-order factor variance to 1.00. The model did not run due to a non-convergence of the matrix. Therefore, comparison was limited to the one-dimensional and the
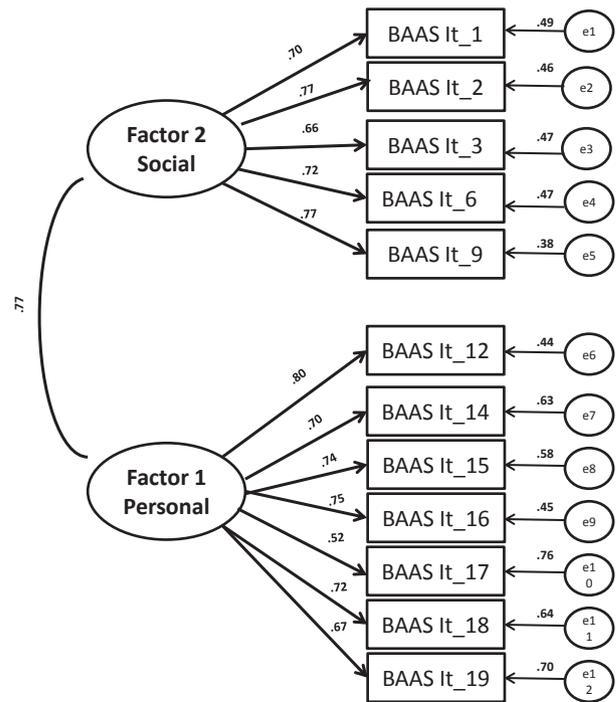

Figure 1 - Confirmatory factor analysis for the bidimensional final solution of the Beliefs About Appearance Scale (BAAS) (sample B, n = 387).

Table 2 - Factor loadings and communalities for principal component analysis with varimax rotation for the 12 items of the final version of the BAAS (sample A, n = 423) and inter-item correlation (sample B, n = 387)

	Factor loading			Inter-item correlations											
Items	Factor 1	Factor 2	h²	1	2	3	6	9	12	14	15	16	17	18	19
1	0.21	**0.70**	0.53	-											
2	0.24	**0.72**	0.57	0.58	-										
3	0.17	**0.75**	0.60	0.46	0.49	-									
6	0.17	**0.72**	0.55	0.55	0.58	0.42	-								
9	0.13	**0.74**	0.56	0.48	0.54	0.60	0.57	-							
12	**0.77**	0.19	0.63	0.43	0.47	0.33	0.35	0.43	-						
14	**0.76**	0.11	0.59	0.39	0.44	0.35	0.39	0.51	0.56	-					
15	**0.81**	0.19	0.69	0.41	0.44	0.43	0.37	0.51	0.62	0.47	-				
16	**0.86**	0.21	0.78	0.41	0.53	0.32	0.38	0.41	0.67	0.51	0.51	-			
17	**0.67**	0.24	0.51	0.33	0.35	0.35	0.32	0.33	0.41	0.40	0.34	0.34	-		
18	**0.70**	0.37	0.63	0.41	0.43	0.43	0.38	0.49	0.50	0.49	0.53	0.46	0.48	-	
19	**0.75**	0.15	0.58	0.32	0.38	0.35	0.36	0.46	0.58	0.52	0.58	0.56	0.32	0.43	
% variance	45.81	14.45													

BAAS = Beliefs About Appearance Scale.
Factor loadings contributing mostly to each factor; h² communalities are highlighted in boldface.
All correlations at p < 0.001.

two first-order factors solutions ($\Delta\chi2_{(1)}$ = 168.46, p < 0.001), with the latter revealing a better fit.

Inter-item correlations for the bidimensional model are presented in Table 2, and correlations between the two factors revealed to be high ($r_{[387]}$ = 0.68, p < 0.001). Cronbach's alpha was 0.87 for factor 1 and 0.85 for factor 2. The final version of the 12-item BAAS in Portuguese is presented in Appendix 1.

Factorial invariance analysis across gender

The bidimensional structure was tested for gender invariance, with results suggesting a BAAS equivalence between men and women due to non-significance among the configural, metric, scalar and strict models. Fit index values remained stable across each invariance test (Table 3).

Men (mean =15.01, standard error [SE] = 0.44) and women (mean = 17.07, SE = 0.38) differed in the personal dimension of the scale (factor 1): $t_{(385)}$ = -3.58, p < 0.001. However, gender differences were not observed between men (mean = 10.79, SE = 0.30) and women (mean = 10.47, SE = 0.26) in the social dimension of the scale (factor 2): $t_{(385)}$ = 0.81, p = 0.42.

Concurrent and discriminant validity

Descriptive statistics and correlations between the scales are presented in Table 4.

In order to examine the unique effects of the subscales under study, the different scales were regressed on the two BAAS subscales. The results indicated that both subscales remained significant and were positive predictors of body dissatisfaction and negative predictors of body esteem. The BAAS did not predict BMI (Table 5).

Validity was supported, as statistically significant relations were found in the expected directions.

Discussion

This study was set out to validate the BAAS and to study its gender invariance in a community sample of heterosexual adults. Overall, the results indicate the reliability and construct validity of the BAAS. The study did not support the one-dimensional structure or an alternative four-factor structure based on the four categories of implications of appearance for relationships, work/achievement, self-image, and emotions, as proposed by the original authors, and not even a second-order solution. Thus, in the current sample, the underlying original hypothesis regarding the structure of the scale and the existence of a single latent variable (i.e., belief about the implications of appearance) was not confirmed. This may be explained

Table 3 - Multigroup nested model comparisons (sample B, n_{women} = 202; n_{men} = 185)

Invariance models	χ² (df)	△χ² (df)	CFI	TLI	RMSEA (90%CI)	p	Comparison
1. Configural	408.866 (128)	-	0.92	0.90	0.06 (.05-.06)	-	-
2. Metric	414.555 (141)	5.689 (13)	0.92	0.92	0.06 (.05-.06)	0.957	1 vs. 2
3. Scalar	415.199 (142)	0.645 (1)	0.92	0.92	0.06 (.05-.06)	0.422	2 vs. 3
4. Strict	419.810 (155)	4.611 (13)	0.93	0.93	0.05 (.05-.06)	0.983	3 vs. 4

90%CI = 90% confidence interval; CFI = comparative fit index; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index.

Table 4 - Descriptive statistics and correlations for scores on the BAAS subscales (social subscale above), GBD, BES subscales and BMI (sample B, n = 387)

	(1)	(2)	(3)	(4)	(5)	(6)	Mean	SD
1. BAAS	-	0.30*	-0.18*	-0.11*	-0.13*	0.00	-	-
2. GBD	0.44*	-	-0.67*	-0.12*	-0.32*	0.18*	9.24	3.91
3. BES 1	-0.27*	-0.67*	-	0.55*	0.52*	-0.22*	42.08	10.12
4. BES 2	-0.12†	-0.21*	0.55*	-	0.56*	-0.07	28.43	4.81
5. BES 3	-0.18*	-0.32*	0.52*	0.56*	-	0.05	15.55	3.16
6. BMI	-0.03	0.18*	-0.22*	0.07	-0.05	-	31.11	8.04
BAAS personal							16.09	5.77
BAAS social							10.62	3.86

BAAS = Beliefs About Appearance Scale; BES 1, 2, 3 = Body Esteem Scale 1, 2 and 3; BMI = body mass index; GBD = General Body Dissatisfaction Scale; SD = standard deviation.
* p < 0.001; † p < 0.05.

by the samples used in the original study, mostly female secondary school and university students. It is known that body image concerns decrease over the life span.[4,23,24] Adolescence, in addition to emerging adulthood, is a period when girls and women fully manifest an objectified view of the self,[25] and the original items may reflect this gender and age bias, which, in turn, may have proven to be less relevant in the current sample that is older than the original one.

The factor analysis revealed a bidimensional structure, with 12 items fulfilling the requirements for item retention. The two dimensions found retained items from all the four originally proposed appearance implication categories (interpersonal, work/achievement, self-image, and feelings/emotions). This finding supports the original author's theoretical standpoint, confirming that these four areas are where individuals' appearance beliefs have implications. However, in this study, they were grouped into two distinct latent variables – belief about the implications of appearance in the personal and in the social domains – that are consistent with the self-objectification theory. This theory was originally developed to account for the role that gender socialization has on women's sexual objectification and subsequently on their mental health, creating vulnerability for the development of eating disorders, depression and sexual disorders.[26] More precisely, across the life cycle, through interpersonal experiences and media representations, girls and women learn that their entire being is, from an observer's perspective, identified with their body. In our view, the socialization perspective of the self-objectification theory accounts for the social domain (factor 2) found in the current study, which aggregates items derived from the interpersonal (e.g., "The amount of influence

I have on other people depends upon how I look") and work/achievement areas (e.g., "The opportunities that are available to me depend upon how I look"). Another important point in the self-objectification theory is that this social outlook is internalized by girls and women who view and treat themselves as objects to be looked at and evaluated, and their feelings about themselves are based on the appearance of their body.[27] This second important stance in self-objectification, in our perspective, explains the first factor found, as it aggregates items from the self-image area (e.g., "How I look is a large part of who I am") and the feelings/emotions area (e.g., "My moods are influenced by how I look"). In short, the two factors found may be explained by two stances of the self-objectification theory: socialization (factor 2) and internalization (factor 1). The amount of explained variance (60.26%) is good and demonstrates that the final solution is suitable for interpretation.

Confirmation of this factorial structure with a distinct sample reinforced the 12-item bidimensional version of the BAAS as a valid measure. The results supported the assumption of factorial invariance across gender. These results suggest that the same two latent variables may be assessed in both men and women in a similar way. This same gender invariance has also been found in other studies that address appearance concerns, namely adolescents' fear of negative appearance.[28] In our view, the same structure of items concerning beliefs and concerns about appearance (adequate) in men and women is consistent with research that has found self-objectification in male samples and demonstrates that self-objectification has shifted from a "women only" process to a global human experience.[29-31] Media content has increasingly focused on the association of

Table 5 - Linear regressions predicting body dissatisfaction, body esteem, and body mass index on the basis of the BAAS subscales (sample B, n = 387)

	Theoretically related (convergent validity)				Theoretically unrelated (discriminant validity)
	GBD	**BES 1**	**BES 2**	**BES 3**	**BMI**
BAAS personal					
B	0.44	-0.27	-0.12	-0.18	-.003
R^2	0.19	0.07	0.02	0.03	0.00
F	90.11*	29.84*	6.02†	13.12*	0.29
BAAS social					
B	0.30	-0.18	-0.11	-0.13	0.00
R^2	0.09	0.03	0.01	0.02	0.00
F	37.86*	13.35*	4.95†	6.73‡	0.01

BAAS = Beliefs About Appearance Scale; BES 1, 2, 3 = Body Esteem Scale 1, 2 and 3; BMI = body mass index; GBD = General Body Dissatisfaction Scale.
* $p < 0.001$; † $p < 0.05$; ‡ $p < 0.01$.

men's as well as women's good body appearance as an important aspect for social approval. Therefore, and in line with social comparison and social learning theory, men are also learning through media and social network exposure that their body appearance is an important aspect of their self-worth.

As for gender comparison, our results support that both men and women report similar levels of appearance beliefs in the social domain, i.e., both believe that others perceive their value according to their appearance. This result further supports that the social objectification of appearance is a common experience for men and women. However, as far as the personal domain is concerned, i.e., the internalization of objectification, women present higher levels in this dimension. A close inspection of the values presented by men and women reveal that even though women's values are statistically significantly higher, both genders present mean agreement scores that reveal moderate internalization of body appearance as central to self-worth. This highlights that not only women, but also men present worries and beliefs about their body appearances as a central construct of self-worth, even though women present a slightly higher internalization of these beliefs, which is consistent with previous research developed with the ASI-R.[8] In our view, the comparison of the results found with these two scales seems to suggest that even though men and women are socialized into the same beliefs about appearance (same level of beliefs in the social domain as measured by the BAAS), women internalize them more profoundly (higher levels of beliefs in the personal domain as assessed by the BAAS), which creates more vulnerability for self-evaluative as well as motivational schematic investment (as measured by the ASI-R).

As expected, the scale demonstrated good concurrent and discriminant validity with relevant constructs. Both domains (personal and social) showed a positive significant moderate relationship with attitudes indicative of body dissatisfaction (GBD), revealing that higher levels of dysfunctional body appearance beliefs relate to higher body dissatisfaction. Both domains consistently predicted global body dissatisfaction, both positively and significantly. Moreover, the negative significant relationship with body esteem-related factors, weight concern (BES 1), physical attractiveness (BES 2), and sexuality (BES 3) in both domains indicates that higher levels of dysfunctional body appearance beliefs are negatively related to different aspects of body esteem. The regression models were significant and both domains significantly negatively predicted all

body esteem factors. The present results replicate the findings of the original research on discriminant validity where no association was found with BMI; consequently, none of the domains predict BMI.

The current study has limitations that cannot be overlooked and compromise the generalizability of the findings, namely the characteristics of the sample, i.e., educated adults in a heterosexual relationship. Furthermore, the use of clinical or subclinical samples with social appearance-related anxiety might provide further understanding of the subscales' utility in different contexts. Future studies should use more diverse samples, especially in order to study the psychometric characteristics of the BAAS in different age ranges and test its gender invariance in different groups, such as sexual minority people (lesbian, gay, bisexual, transgender/transsexual and intersexed – LGBTI).

In short, we have demonstrated that a two-factor solution with 12 items of the BAAS is a valid and reliable scale that is relevant for research with adults of both genders.

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Disclosure

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Appendix 1 - Final version of the 12-item Beliefs About Appearance Scale (BAAS) in Portuguese

Instruções: Assinale com uma cruz a opção que melhor ilustra o seu grau de concordância com cada uma das afirmações.	0- Não concordo	1- Concordo um pouco	2- Concordo moderadamente	3- Concordo bastante	4- Concordo completamente
Domínio Social - Interpessoal					
1. A opinião que os outros têm de mim é baseada na minha aparência.					
2. A influência que tenho sobre as outras pessoas depende da minha aparência.					
3. Se a minha aparência não for a melhor possível, os outros ter-me-ão em pouca conta.					
Domínio Social - Sucesso					
4. O sucesso que terei no meu trabalho ou carreira depende da minha aparência.					
5. As oportunidades que tenho dependem da minha aparência.					
Domínio Pessoal - Auto-imagem					
6. A forma como me sinto acerca de mim próprio depende bastante da minha aparência.					
7. A minha aparência é uma parte muito importante de quem eu sou.					
8. É difícil sentir-me bem comigo quando a minha aparência não é a melhor.					
Domínio Pessoal - Sentimentos					
9. A minha capacidade de me sentir feliz depende da minha aparência.					
10. Melhorar a minha aparência é uma das poucas actividades que me faz sentir bem, e que me faz sentir que realmente estou a fazer algo importante.					
11. A minha vida será mais emocionante ou interessante se eu tiver uma boa aparência.					
12. O meu humor é influenciado pela minha aparência.					