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Exploratory and Confirmatory Factor Analysis, and Psychometric Properties, of a Spanish
Translation of the Body Appreciation Scale-2 (BAS-2)

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Abstract

We examined the psychometric properties of a Spanish translation of the Body Appreciation Scale-2 (BAS-2) in a community sample of 411 women and 389 men in Almería, Spain. Participants completed the 10-item BAS-2 along with measures of appearance evaluation, body areas satisfaction, self-esteem, life satisfaction, and self-reported body mass index (BMI). Exploratory factor analyses with one split-half subsample revealed that BAS-2 scores had a one-dimensional factor structure in women and men. Confirmatory factor analysis with a second split-half subsample showed the one-dimensional factor structure had acceptable fit and was invariant across sex. There were no significant sex differences in BAS-2 scores. BAS-2 scores were significantly and positively correlated with appearance evaluation, body areas satisfaction, self-esteem, and life satisfaction. Body appreciation was significantly and negatively correlated with BMI in men, but associations in women were only significant in the second subsample. Results suggest that the Spanish BAS-2 has adequate psychometric properties.

Keywords: Body appreciation; Positive body image; Spain; Translation; BAS-2

Introduction

Body appreciation is defined as “accepting, holding favorable opinions toward, and respecting the body, while also rejecting media-promoted appearance ideals as the only form of human beauty” (Tylka & Wood-Barcalow, 2015, p. 53). The construct was initially measured using the 13-item Body Appreciation Scale (BAS), with the parent study supporting a one-dimensional factor structure in English-speaking U.S. adults (Avalos, Tylka, & Wood-Barcalow, 2005). However, some studies conducted with non-English-speaking samples have instead reported that BAS scores reduce to two distinct dimensions, tapping body appreciation and body image investment separately (for reviews, see Swami, 2017; Webb, Wood-Barcalow, & Tylka, 2015). In light of this issue, and to keep pace with developments in the conceptualisation of body appreciation, Tylka and Wood-Barcalow (2015) developed a revision of the scale, known as the Body Appreciation Scale-2 (BAS-2).

In the parent study with U.S. adults, Tylka and Wood-Barcalow (2015) found through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) that the 10-item BAS-2 had a one-dimensional factor structure, with adequate internal consistency. Studies using EFA have also supported this one-dimensional structure for scores derived from Cantonese (Swami & Ng, 2015), Persian (Atari, 2016), Serbian (Jovic, Sfroza, Jovanovic, & Jovic, 2016), Icelandic (Pálmarsdóttir & Karlsdóttir, 2016), and Dutch (Alleva, Martijn, Veldhuis, & Tylka, 2016) translations of the BAS-2. In addition, one study using CFA indicated that scores from a Standard Chinese version of the scale had adequate fit (Swami, Ng, & Barron, 2016). Finally, support for a one-dimensional structure has been provided for French BAS-2 scores using both EFA and CFA (Kertechian & Swami, 2017). These studies suggest that the BAS-2 retains its one-dimensional factor structure across distinct linguistic and national groups.

In addition, several studies have indicated that BAS-2 scores are invariant across participant sex (Kertechian & Swami, 2017; Swami et al., 2016; Tylka & Wood-Barcalow, 2015). Most studies that have examined sex differences in BAS-2 scores have reported that men have significantly higher body appreciation than women (Atari, 2016; Kertechian & Swami, 2017; Swami & Ng, 2015; Tylka & Wood-Barcalow, 2015). However, the effect sizes of the reported differences have generally been small-to-moderate ($ds = 0.15-0.58$) and one study found no significant difference between women and men from mainland China (Swami et al., 2016). Beyond sex differences, the available evidence also suggests that BAS-2 scores have adequate internal consistency coefficients across studies, as well as good patterns of convergent validity. Only the parent study has examined test-retest reliability, finding that BAS-2 scores retained their reliability up to three weeks (Tylka & Wood-Barcalow, 2015).

In the present study, we examined the psychometric properties of a Spanish translation of the BAS-2 in a community sample of adults. Doing so is important as it not only extends the available cross-cultural research on the BAS-2, but it may also provide a useful tool for the assessment of positive body image in Spanish-speaking populations. Indeed, based on the estimated number of mother-tongue speakers, Spanish is the second-most widely spoken language in the world (Paulillo & Das, 2006). Specifically, we examined factor structure of Spanish BAS-2 scores using both EFA and CFA, and expected to find support for a one-dimensional structure that includes all 10 items. We also examined whether BAS-2 scores were invariant across sex and hypothesised that men would have significantly higher body appreciation than women. Finally, we examined the convergent validity of BAS-2 scores by examining associations with appearance evaluation, body areas satisfaction, self-esteem, life satisfaction, and self-reported body mass index (BMI). These variables were selected on the basis of availability of previously-validated measures in Spanish and based on previous assessments of

the convergent validity of BAS-2 scores. In both women and men, evidence of convergent validity would be provided to the extent that body appreciation was positively associated with appearance evaluation, body areas satisfaction, self-esteem, and life satisfaction, and negatively associated with BMI.

Method

Participants

Participants of this study were 411 women and 389 men recruited from the community in Almería, a city in Andalusia, Spain. All participants were citizens of Spain (*pueblo español*) and most self-reported as Christians (83.3%). Participants ranged in age from 17 to 86 years ($M = 26.77$, $SD = 11.25$) and in BMI from 14.56-43.56 kg/m² ($M = 24.09$, $SD = 4.12$). Most participants were single (65.1%), while others were married (12.3%), cohabiting but unmarried (11.0%), or of some other marital status.

Measures

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

Appearance evaluation. We used the Appearance Evaluation Subscale of the Multidimensional Body-Self Relations Questionnaire–Appearance Subscales (MBSRQ-AS; Cash, 2000; Spanish translation: Roncero, Perpiña, Marco, & Sánchez-Reales, 2015). This is a 7-

item measure that assesses one's beliefs and feelings of satisfaction or dissatisfaction with appearance. All items were rated on a 5-point scale, ranging from 1 (*Definitely disagree*) to 5 (*Definitely agree*) and an overall score was computed as the mean of all items so that higher scores reflect more positive appearance evaluation. CFA indicated that the Spanish translation of the Appearance Evaluation Subscale retained all items as its parent version, showed good fit indices, and had adequate internal consistency coefficients (Roncero et al., 2015). In the present study, the Appearance Evaluation Subscale had adequate internal consistency (Cronbach $\alpha = .76$).

Body areas satisfaction. The questionnaire included the Body Areas Satisfaction Subscale of the MBSRQ-AS (Cash, 2000; Spanish translation: Roncero et al., 2015). This subscale includes 9 items that measure satisfaction with specific body areas or attributes. All items were rated on a 5-point scale, ranging from 1 (*Very dissatisfied*) to 5 (*Very satisfied*). An overall score was calculated as the mean of all items. Higher scores on this subscale reflect greater body areas satisfaction. The Spanish version of the Body Areas Satisfaction Subscale retains all items as its parent version and has been shown to have good fit indices and adequate internal consistency (Roncero et al., 2015). In the present study, the Body Areas Satisfaction Subscale had adequate internal consistency (Cronbach $\alpha = .79$).

Self-esteem. Participants were asked to complete the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965; Spanish translation: Martín-Albo, Núñez, Navarro, & Grijalvo, 2007). The RSES is a 10-item measure of an individual's overall sense of self-worth and items were rated on a 4-point scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*). An overall score was computed as the mean of all items, with higher scores reflecting greater self-esteem. Scores on the Spanish RSES have good (CFA-derived) factorial and convergent validity, adequate internal consistencies, and good test-retest reliability up to 4 weeks (Martín-Albo et al., 2007). In the present study, Cronbach α for this scale was .84.

Life satisfaction. Life satisfaction was measured using the 5-item Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985; Spanish translation: Vásquez, Duque, & Hervás, 2013), which assesses satisfaction with the quality of one's life. Items were rated on a 7-point scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). An overall score was computed as the mean of all items, with higher scores reflecting greater life satisfaction. A CFA of Spanish SWLS scores with a representative sample of Spanish adults showed that the one-factor solution with all 5 items had good fit with adequate internal consistency (Vásquez et al., 2013). Here, Cronbach α for the SWLS was .86.

Demographics. Participants were asked to provide their demographic information, consisting of sex, age, citizenship, religion, and marital status. We also obtained self-reported height and weight data to compute BMI as kg/m^2 . Previous work has indicated that, in Spanish populations, self-reported BMI is strongly associated with objectively-measured BMI in non-elderly age groups (Alvarez-Torices, Franch-Nadal, Alvarez-Guisasola, Hernandez-Mejia, & Cueto-Espinar, 1993).

Procedures

Ethics approval for this project was obtained from the Bioethics Committee of Human Research at the University of Almería. Two research assistants opportunistically recruited participants from public areas of congregated activities (e.g., shopping streets, parks) in Almería between November 2016 and January 2017. More specifically, the research assistants directly approached potential participants and provided them with information about the study (i.e., it was advertised as research on health and appearance). To be eligible for participation, participants were required to be citizens of Spain (*pueblo español*) and above the age of 16. Those who agreed to participate provided written informed consent and completed an anonymous paper-and-pencil version of the questionnaire. This was done in a quiet area that we set up in areas of

congregate activity for the purposes of this study. The order of presentation of the scales listed above was semi-randomised, with the demographic items always appearing last. All participation was voluntary and participants were not remunerated in any form. Upon return of completed questionnaires, participants were provided with written debrief information.

Statistical Analyses

To examine the psychometric properties of the Spanish BAS-2, we used a two-step analytic strategy. First, the total dataset was split using a computer-generated random seed. The factor structure of the BAS-2 was assessed in the first split-half ($n = 400$) using principal-axis EFA in IBM SPSS Statistics v.20. The sample size in this split-half far exceeded conservative item-to-participant ratio requirements (Tabachnick & Fidell, 2013). A quartimax rotation was used, as we expected a single, orthogonal factor (Pedhazur & Schmelkin, 1990). Factor loadings were interpreted using Tabachnick and Fidell's (2013) recommendations, with loadings of .71 and above considered excellent, .63-.70 considered very good, .55-.62 considered good, .33-.45 considered fair, and .32 or lower considered poor.

Data from the second split-half subsample ($n = 400$) were subjected to CFA using Analysis of Moment Structures (AMOS v.23). Hypothesized modelling was based on the results of the EFA in the first split-half, as well as the expected one-dimensional factor structure. Standard goodness-of-fit indices were selected *a priori* to assess the measurement models (Hu & Bentler, 1999). The normed model chi-square (χ^2_{normed}) is reported with lower values of the overall model χ^2 indicating goodness-of-fit. A χ^2_{normed} value of < 3.00 indicates good fit. The Steiger-Lind root mean square error of approximation (RMSEA) and its 90% confidence interval provide a correction for model complexity. RMSEA values close to .06 indicate a good fit, with values ranging to .10 representing a mediocre fit. The standardized root mean square residual (SRMR) assesses the mean absolute correlation residual and is a badness-of-fit index: the smaller

the SRMR, the better the model fit. A cut-off value for SRMR is recommended to be close to or $< .09$. The comparative fit index (CFI) measures the proportionate improvement in fit by comparing a target model with a more restricted, nested baseline model. The CFI reflects a goodness-of-fit index and is recommended to close to or $> .95$ for adequate fit.

We also examined whether BAS-2 scores were invariant across sex at the configural (i.e., whether similar factors are measured), factor loading (i.e., whether the magnitude of factor loadings is the same), and intercept (i.e., whether the intercept of the regression relating each item to its factor is the same) levels (Chen, 2007). In both split-halves separately, we examined sex differences in body appreciation scores, computed internal consistency coefficients using Cronbach's α , and examined correlations between body appreciation, appearance evaluation, body areas satisfaction, self-esteem, life satisfaction, and BMI.

Results

Exploratory Factor Analyses

Female sample ($n = 196$). Means and standard deviations for all BAS-2 items are presented in Table 1. These data were suitable for EFA based on item distribution, average correlation with other items, and item-total correlations (Clark & Watson, 1995). Both the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.92) and the significance of Bartlett's test of sphericity, $\chi^2(45) = 1004.49, p < .001$, indicated that these data had adequate factorability. The results of the principal-axis EFA indicated that only a single factor should be extracted ($\lambda = 5.40$), explaining 54.0% of the total variance. As can be seen in Table 1, all items had good-to-excellent factor loadings.

Male sample ($n = 204$). Descriptive statistics for all 10 items for men are reported Table 1. These data passed standard criteria for EFA (Clark & Watson, 1995). The KMO measure of sampling adequacy was .93 and Bartlett's test of sphericity was significant, $\chi^2(45) = 1082.79, p <$

.001, indicative of adequate factorability. As with the female sample, the results of a principal-axis EFA suggested that a single factor should be extracted. This factor had an eigenvalue of 5.55 and explained 55.5% of the total variance. As reported in Table 1, all items had good-to-excellent loadings.

Further analyses. For both women and men, we computed total BAS-2 by taking the mean of all items. Internal consistency coefficients were adequate for women (Cronbach $\alpha = .90$, 95% $CI = .88-.92$) and men (Cronbach $\alpha = .91$, 95% $CI = .89-.93$). An independent-samples t -test indicated that there was no significant sex difference on BAS-2 scores between women ($M = 3.77$, $SD = 0.75$) and men ($M = 3.84$, $SD = 0.72$), $t(398) = 0.92$, $p = .359$, $d = 0.10$. In women, body appreciation was significantly and positively correlated with appearance evaluation, body areas satisfaction, self-esteem, and life satisfaction, but not with BMI. In men, body appreciation was significantly correlated with appearance evaluation, body areas satisfaction, life satisfaction, BMI, and self-esteem (see Table 2).

Confirmatory Factor Analysis

Hypothesized model fit ($n = 400$). The results of the EFAs with the first split-half pointed to a one-dimensional factor structure for Spanish BAS-2 scores, with all 10 items loading onto this dimension. We, therefore, examined the fit of this hypothesised one-factor solution using CFA with the second split-half sample. The standardised estimates of factor loadings for the best-fitting model were all very good-to-excellent (see Figure 1). Fit indices values were found to be: $\chi^2_{M(35, N = 400)} = 188.741$, $\chi^2_{\text{normed}} = 5.393$, CFI = .944, RMSEA = .105 with 90% $CI = .091-.120$, SRMR = .036. Since the fit indices values of analysis were not found to be at acceptable intervals, suggested modification indices were taken into account to improve the model. Modification indices were consulted to free error covariances (items #1 and #2, and items #2 and #8). This one-dimensional structure provided an acceptable fit to the data: $\chi^2_{M(33, N =$

400) = 129.784, $\chi^2_{\text{normed}} = 3.933$, CFI = .965, RMSEA = .086 (low = .071, high = .102), SRMR = .031.

Sex invariance. The unconstrained model had adequate fit in the female ($n = 215$) and male ($n = 185$) sub-samples individually (see Table 3 for sub-sample metrics), suggesting configural invariance between the sexes. Differences between the unconstrained and fully constrained model were not significant, indicating that the structure of the model achieved factor loading invariance across sex, $\Delta\chi^2(9) = 4.341$, $p = .888$. Finally, intercept invariance was evaluated, where all item-factor intercepts were constrained equally across participant sex and evaluated against the factor loading invariance model. According to the $\Delta\chi^2$, intercept invariance was evident, $\Delta\chi^2(10) = 2.94$, $p = .983$. Therefore, from these data, we find acceptable evidence for the one-dimensional structure for the BAS-2 across sex.

Further analyses. Internal consistency coefficients for overall BAS-2 scores were adequate in women (Cronbach $\alpha = .94$, 95% $CI = .93-.95$) and men (Cronbach $\alpha = .93$, 95% $CI = .91-.95$). In this sub-sample, there was no significant difference in body appreciation between women ($M = 3.81$, $SD = 0.81$) and men ($M = 3.78$, $SD = 0.79$), $t(398) = 0.42$, $p = .675$, $d = 0.04$. In both women and men, body appreciation was significantly correlated with appearance evaluation, body areas satisfaction, life satisfaction, self-esteem, and BMI (see Table 4).

Discussion

Previous studies have reported that BAS-2 scores have a one-dimensional factor structure in distinct linguistic and national groups (Alleva et al., 2016; Atari, 2016; Jovic et al., 2016; Kertechian & Swami, 2017; Pálmarsdóttir & Karlsdóttir, 2016; Tylka & Wood-Barcalow, 2015; Swami & Ng, 2015; Swami et al., 2016). Our results are consistent with this literature: using EFA, we found that all 10 items of the Spanish BAS-2 loaded onto the same latent dimension in a first split-half subsample. Furthermore, using CFA, we were able to confirm that this one-

dimensional model had adequate fit in a second split-half subsample following modifications. Taken together, the available evidence suggests that BAS-2 scores retain a one-dimensional factor across different cultural groups. This is important as it will facilitate effective cross-cultural comparisons of body appreciation in future work.

Our results also indicated that Spanish BAS-2 scores were invariant across participant sex, which is consistent with previous findings (Kertechian & Swami, 2017; Swami et al., 2016; Tylka & Wood-Barcalow, 2015). However, contrary to our hypothesis, we found that there were no significant sex differences in body appreciation in both split-half subsamples. The available literature on sex differences in body appreciation is mixed, with one study reporting no significant difference (Swami et al., 2016) and others reporting significant differences with small-to-moderate effects (Atari, 2016; Kertechian & Swami, 2017; Swami & Ng, 2015; Tylka & Wood-Barcalow, 2015). Furthermore, a previous study of Spanish adolescents who completed the BAS also reported a significant sex difference, though again the effect size was small (Jáuregui Lobera & Bolaños Ríos, 2011). Tiggemann (2015) has cautioned against drawing strong conclusions about (the lack of) sex differences in body appreciation in the absence of other axes of social identity, such as ethnicity or class, as it is likely that the intersection of these axes determines the experience of body appreciation across social identities.

Our results also indicated that body appreciation scores had adequate internal consistency coefficients in women and men. Further, we found that Spanish BAS-2 scores had good patterns of convergent validity: body appreciation was significantly and positively associated with appearance evaluation, body areas satisfaction, self-esteem, and life satisfaction in both women and men. Evidence of convergent validity in terms of BMI, however, was mixed: while we found the expected negative association in men in both split-half samples, the association in women was weak in one split-half and did not reach significance in the other. The mixed findings with

women stand in contrast to previous studies that have consistently reported significant negative correlations (Alleva et al., 2016; Atari, 2016; Kertechian & Swami, 2017; Swami & Ng, 2015; Swami et al., 2016; Tylka & Wood-Barcalow, 2015), although it should be acknowledged that reported associations have tended to be weak. This aspect of our results could be investigated further, as it may be suggestive of problems with using self-reported BMI as an index of convergent validity for BAS-2 scores.

The present study benefitted from using a community sample of Spanish adults, but a number of sampling limitations should be highlighted. First, our recruitment strategy means that our sample is unlikely to be representative of the wider Spanish population. Likewise, although we limited participation to citizens of Spain (*pueblo español*), we did not request information about ethnicity (itself a problematic concept in the Spanish context). Future research could extend the present findings by examining the psychometric properties of the Spanish BAS-2 in other national groups that speak Spanish (e.g. in Central and South America), as well as in other sub-national regions of Spain. Future work could also examine associations between body appreciation and a wider set of factors to establish the divergent and incremental validity of Spanish BAS-2 scores. Nevertheless, the present study presents preliminary evidence that the Spanish BAS-2 may be useful tool for the assessment of positive body image in Spanish-speaking populations.

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Table 1. *Items of the Body Appreciation Scales-2, Descriptive Statistics for Women and Men, and Item-Factor Loadings in the First Split-Half Sample (n = 400)*

Item	Female sample (n = 196)		Male sample (n = 204)	
	<i>M (SD)</i>	Loading	<i>M (SD)</i>	Loading
1. I respect my body/ <i>Respecto mi cuerpo</i>	3.89 (1.03)	.65	4.04 (0.92)	.69
2. I feel good about my body/ <i>Me siento bien con mi cuerpo</i>	3.85 (0.99)	.82	3.84 (0.94)	.82
3. I feel that my body has at least some good qualities/ <i>Siento que mi cuerpo tiene buenas cualidades</i>	3.73 (0.97)	.74	3.89 (0.91)	.77
4. I take a positive attitude towards my body/ <i>Tengo una actitud positiva hacia mi cuerpo</i>	3.87 (1.01)	.84	3.87 (0.96)	.80
5. I am attentive to my body's needs/ <i>Estoy atento a las necesidades de mi cuerpo</i>	3.77 (0.99)	.63	3.81 (0.92)	.55
6. I feel love for my body/ <i>Siento amor por mi cuerpo</i>	3.54 (1.12)	.77	3.69 (1.02)	.79
7. I appreciate the different and unique characteristics of my body/ <i>Aprecio las características únicas y diferentes de mi cuerpo</i>	3.65 (1.06)	.79	3.71 (1.00)	.74

8. My behaviour reveals my positive attitude toward my body; for example, I hold my head high and smile/ <i>Mi comportamiento revela mi actitud positive sobre mi cuerpo; por ejemplo, yo levanto mi cabeza y sonrío</i>	3.80 (1.03)	.65	3.81 (0.98)	.76
9. I am comfortable in my body/ <i>Estoy cómodo/a con mi cuerpo</i>	3.77 (1.03)	.83	3.83 (1.00)	.83
10. I feel like I am beautiful even if I am diffeent from media images of attractive people (e.g., models, actresses/actors)/ <i>Me siento bien, aunque soy diferente a los prototipos de belleza (EJ: modelos, actores)</i>	3.86 (1.01)	.58	3.89 (1.04)	.65

Table 2. *Correlation Matrix for Women (n = 196; Top Diagonal) and Men (n = 204; Bottom Diagonal) in the First Split-Half Sample*

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Body appreciation		.66*	.62*	.40*	.35*	-.09
(2) Appearance evaluation	.69*		.54*	.39*	.27*	-.25*
(3) Body areas satisfaction	.64*	.66*		.36*	.30*	-.09
(4) Self-esteem	.36*	.32*	.23*		.34*	-.04
(5) Life satisfaction	.41*	.37*	.40*	.33*		-.07
(6) Body mass index	-.38*	-.36*	-.36*	-.08	-.13	

Note. * $p < .001$.

Table 3. *Model Fit Indices and Tests of Measurement Invariance for the One-Factor Body Appreciation Scale-2 Model Across Participant Sex*

	χ^2_M	df _M	χ^2_{normed}	RMSEA (90% CI)	SRMR	CFI
Men ($n = 185$)	98.666	33	2.990	.104 (.081, .128)	.042	.946
Women ($n = 215$)	85.448	33	2.589	.086 (.064, .109)	.034	.966
Configural Invariance	184.124	66	2.790	.067 (.056, .079)	.042	.958
Factor Loading Invariance	188.465	75	2.513	.062 (.051, .073)	.043	.959
Intercept Invariance	191.405	85	2.252	.056 (.046, .067)	.043	.962

Table 4. *Correlation Matrix for Women (n = 215; Top Diagonal) and Men (n = 185; Bottom Diagonal) in the Second Split-Half Sample*

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Body appreciation		.67**	.67**	.34**	.36**	-.15*
(2) Appearance evaluation	.67**		.72**	.45**	.39**	-.24**
(3) Body areas satisfaction	.63**	.56**		.42**	.39**	-.14*
(4) Self-esteem	.31**	.34**	.23**		.34**	-.05
(5) Life satisfaction	.39**	.29**	.40**	.36**		-.15*
(6) Body mass index	-.32**	-.35**	-.19*	.02	-.12	

Note. * $p < .001$.

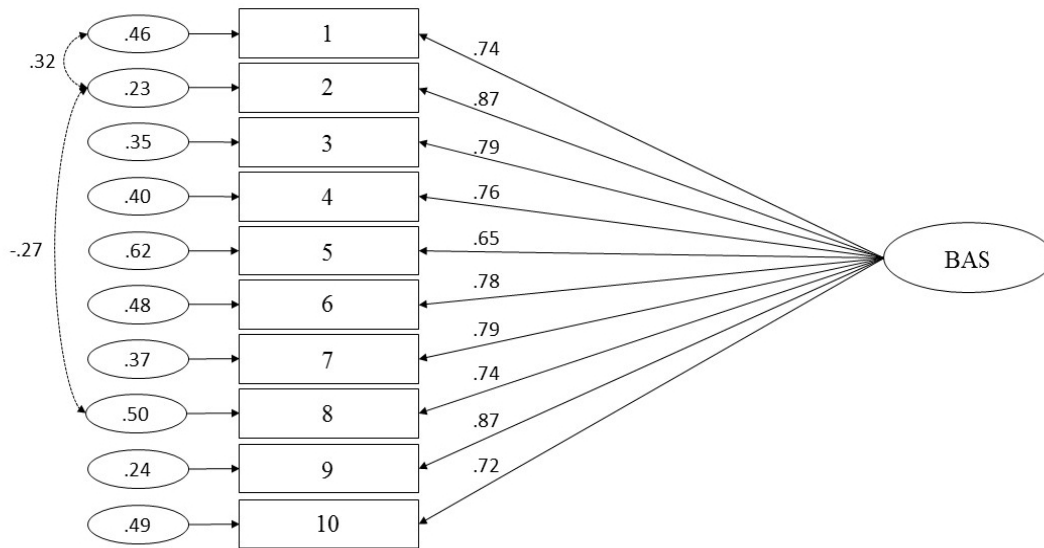


Figure 1. Path diagram and estimates for the one-dimensional model of the Body Appreciation Scale-2. The large oval is the latent construct, with the rectangles representing measured variables, and the small circles with numbers representing the residual variables (variances). The path factor loadings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