



Factor structure and psychometric properties of the Body Appreciation Scale-2 among adolescents and young adults in Danish, Portuguese, and Swedish

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ABSTRACT

In recent years, the study of body image shifted from focusing on the negative aspects to a more extensive view of body image. The present study seeks to validate a measure of positive body image, the Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015a) in Denmark, Portugal, and Sweden. Participants ($N = 1012$) were adolescents and young adults aged from 12 to 19. Confirmatory factor analyses confirmed the one-dimensional factor structure of the scale. Multi-group confirmatory factor analyses indicated that the scale was invariant across sex and country. Further results showed that BAS-2 was positively correlated with self-esteem, psychological well-being, and intuitive eating. It was negatively correlated with BMI among boys and girls in Portugal but not in Denmark and Sweden. Additionally, boys had higher body appreciation than girls. Results indicated that the BAS-2 has good psychometric properties in the three languages.

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1. Introduction

Traditionally, research on body image has focused on the negative aspects of body image or on body dissatisfaction (Avalos, Tylka, & Wood-Barcalow, 2005). However, over the last decade, scholars have shifted their attention to a broader view including both negative and positive components of body image (Tylka & Wood-Barcalow, 2015b). Indeed, positive body image is a unique construct that is not merely the opposite of negative body image (Striegel-Moore & Cachelin, 1999). Tylka and Wood-Barcalow

(2015a) defined body appreciation as “accepting, holding favorable opinions toward, and respecting the body, while also rejecting media-promoted appearance ideals as the only form of human beauty” (2015a, p. 53).

Avalos et al. (2005) created a measure, the Body Appreciation Scale (BAS), to measure body appreciation. The BAS is a 13-item scale which possesses good psychometric properties among both females (Avalos et al., 2005) and males (Tylka, 2013). The BAS is a one-dimensional scale, and its scores evidenced good reliability, consistency, and convergent validity with college women (Avalos et al., 2005). Later, Tylka (2013) also found measurement invariance in BAS scores between college women and men. Although some studies replicated the one-dimension structure of the scale, others have found that the BAS has a multi-dimensional factor structure (Alexias, Togas, & Mellon, 2016; Atari, Akbari-Zardkhaneh, Mohammadi, & Soufiabadi, 2015; Swami, Özgen, Gökçen, & Petrides, 2015; for a review of studies before 2015, see Webb, Wood-Barcalow, & Tylka, 2015). As the BAS does not

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measure exactly the same concept in different languages, the comparison of body image across cultures is impeded.

Recently, in order to address this issue and to be in keeping with recent developments of the concept of positive body image, Tylka and Wood-Barcalow (2015a) created the Body Appreciation Scale-2 (BAS-2), a 10-item updated version of the scale. Original BAS Items 4 and 13 were modified because they contained terms which were associated to a negative body orientation (e.g., “Despite its imperfections, I still like my body”). Original BAS Items 8 and 9 were deleted because they referred to the ignorance of one’s appearance rather than the celebration of one’s body (e.g., “My self-worth is independent of my body shape or weight”). The original BAS Item 12 was deleted because it was sex-specific (“I do not allow unrealistically thin [muscular] images of women [men] presented in the media to affect my attitudes toward my body”). Additional items were created for the BAS-2 that were based on findings from qualitative positive body image studies (e.g., Frisén & Holmqvist, 2010).

In samples of college and community women and men, Tylka and Wood-Barcalow (2015a) found that the final 10-item BAS-2 had a one-dimensional structure and its scores were internally consistent and stable across a 3-week period. Following the validation of the BAS-2 in English, Tiggemann (2015) called for an examination of its factorial equivalence among different cultures. Since then, the BAS-2 has been validated in Cantonese (Swami & Ng, 2015), Standard Chinese (Swami, Ng, & Barron, 2016), Dutch (Alleva, Martijn, Veldhuis, & Tylka, 2016), French (Kertechian & Swami, 2017), Icelandic (Pálmarsdóttir & Karlsdóttir, 2016), Japanese (Namatame, Uno, & Sawamiya, 2017), Persian (Atari, 2016), Polish (Razmus & Razmus, 2017), Brazilian Portuguese (Alcaraz-Ibáñez, Cren Chiminazzo, Sicilia Camacho, & Teixeira Fernandes, 2017), Romanian (Swami, Tudorel, Goian, Barron, & Vintila, 2017), Serbian (Jovic, Sforza, Jovanovic, & Jovic, 2016), and Spanish (Swami, García, & Barron, 2017).

These studies have shown that, across many geographic regions, scores on the BAS-2 have evidenced good convergent validity. The BAS-2 is positively correlated with various well-being indices, including self-esteem (e.g., Atari, 2016; Swami, García et al., 2017; Swami & Ng, 2015), life satisfaction (e.g., Atari, 2016; Swami, García et al., 2017; Swami et al., 2016), intuitive eating (Tylka & Wood-Barcalow, 2015a), positive affect (Razmus & Razmus, 2017), positive life orientation (Razmus & Razmus, 2017), subjective happiness (Swami, García et al., 2017), and proactive coping (Tylka & Wood-Barcalow, 2015a). Among women, the BAS-2 is also negatively correlated with actual-ideal weight discrepancy (Swami & Ng, 2015; Swami et al., 2016) and positively correlated with optimistic life orientation (Alleva et al., 2016). The results regarding the relationship between the BAS-2 and body mass index (BMI) are not so clear: Swami, García et al. (2017) and Swami, Tudorel et al. (2017) found a negative relationship between the BAS-2 and BMI, while other studies found no relationship (Swami & Ng, 2015; Swami et al., 2016).

Furthermore, studies have revealed measurement invariance (i.e., equivalence) of the BAS-2 between women and men (e.g., Kertechian & Swami, 2017; Swami, García et al., 2017; Tylka & Wood-Barcalow, 2015a), which indicates that men’s and women’s scores on the BAS-2 can be meaningfully compared. Although Swami et al. (2016); Swami, García et al. (2017), and Razmus and Razmus (2017) found no difference between men and women in mainland China, Spain, and Poland respectively, most studies reported that men have significantly higher body appreciation than women, with a small or moderate effect size, Cohen’s $d = 0.13$ – 0.58 (e.g., Atari, 2016; Kertechian & Swami, 2017; Tylka & Wood-Barcalow, 2015a).

As body image is at its most vulnerable state during adolescence (Littleton & Ollendick, 2003), it is important to investigate

its development during this particular period. Findings regarding the evolution of positive body image during adolescence are mixed. Some research studies found that positive body image was stable during adolescence (Soest & Wichstrøm, 2009) while other results indicated either a decrease (Eisenberg, Neumark-Sztainer, & Paxton, 2006) or an increase (Holsen, Jones, & Birkeland, 2012). The inconsistency of these results may be due to the variability of the instruments used to measure positive body image. According to our knowledge, only three studies have used the BAS-2 among children and adolescents (Alcaraz-Ibáñez et al., 2017; Halliwell, Jarman, McNamara, Risdon, & Jankowski, 2015; Halliwell, Tylka, & Slater, 2017). Halliwell et al. (2015) examined the changes in body appreciation, after a body image intervention, among 14- and 15-year old girls. Alcaraz-Ibáñez et al. (2017) examined the factor structure of the BAS-2 among Brazilian adolescents. Halliwell et al. (2017) created the Body Appreciation Scale-2 for Children (BAS-2C), an adapted version of the scale that can be used among children as young as 9 years old.

Moreover, in order to compare the level of positive body image among different cultures, it is essential to examine the cross-cultural equivalence of the BAS-2 (Swami, García et al., 2017). Even though the BAS-2 has been used among more than 10 culture groups (e.g., Atari, 2016; Kertechian & Swami, 2017; Namatame et al., 2017), its cross-cultural measurement invariance has not been tested. Although the BAS-2 has been validated in many countries, it has not been validated in Denmark, Portugal, and Sweden. The validation of the BAS-2 in these additional three countries will increase its cross-cultural validity. Cross-cultural classifications (Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004) grouped Denmark and Sweden in the same cluster (i.e., Nordic Europe) while Portugal is either grouped with other southern European countries (i.e., Latin Europe) or with countries from South America (i.e., Latin America). Therefore, by comparing the level of body appreciation between these three countries, we can assess cross-cultural differences, whether small (expected between Denmark and Sweden) or large (expected between Denmark and Portugal and between Portugal and Sweden).

The present study aimed to validate the BAS-2 among adolescents and young adults from three different countries: Denmark, Portugal, and Sweden. First, we examined the factor structure of the BAS-2 among adolescent and young adult males and females in these countries. As all studies that examined the BAS-2 factor structure found that the BAS-2 is composed of one dimension (e.g., Atari, 2016; Kertechian & Swami, 2017; Swami, García et al., 2017), it was hypothesized that the BAS-2 has a one-factor structure in all samples. Second, the measurement invariance of the BAS-2 across sex and country was assessed. As previous studies reported a similar factor structure and good psychometric properties (e.g., Alleva et al., 2016; Swami et al., 2016; Tylka & Wood-Barcalow, 2015a), it was hypothesized that the BAS-2 is invariant across sex and country. Third, we examined the convergent validity of the Danish, Portuguese, and Swedish versions of the BAS-2 by examining their correlations with self-esteem, psychological well-being, intuitive eating, and BMI in both sexes. Taking into account the results found in other validation studies (e.g., Atari, 2016; Swami, García et al., 2017; Swami & Ng, 2015; Tylka & Wood-Barcalow, 2015a) and results using the BAS among adolescents (Atari, Jamali, Bahrami-Ehsan, & Mohammadi, 2017), it was hypothesized that the BAS-2 will be positively correlated with self-esteem, psychological well-being, and intuitive eating and negatively correlated with BMI in all samples. These variables were selected as they were used to assess convergent validity in previous validation studies of the BAS-2. Finally, differences between sex and country were assessed. In accordance with previous results (e.g., Atari, 2016; Kertechian & Swami, 2017; Tylka & Wood-Barcalow, 2015a), it was expected that girls would have lower body appreciation than boys, but that

the effect size of the difference will be either small or moderate. The intercultural difference in terms of body appreciation has never been studied. Therefore, our last objective of this study is to begin this line of inquiry by testing the following research question: is there a difference in terms of body image among Danish, Portuguese, and Swedish adolescents?

2. Method

2.1. Participants

The total sample consisted of 1012 adolescents and young adults (482 boys and 530 girls) from Denmark ($n = 129$), Portugal ($n = 513$), and Sweden ($n = 370$). They were aged from 12 to 19 years old ($M = 15.1$, $SD = 1.9$ for the total sample; $M = 14.4$, $SD = 2.1$ for the Danish sample; $M = 15.0$, $SD = 2.1$ for the Portuguese sample; and $M = 15.5$, $SD = 1.3$ for the Swedish sample). Participants were significantly older in Sweden and significantly younger in Denmark, $F(2, 1009) = 20.28$, $p < .001$, $\omega^2 = .037$. The self-reported BMI level of participants ranged from 11.72 to 51.14 kg/m² ($M = 21.01$, $SD = 3.57$ for the total sample; $M = 19.61$, $SD = 3.85$ for the Danish sample; $M = 20.89$, $SD = 3.41$ for the Portuguese sample; and $M = 21.68$, $SD = 3.54$ for the Swedish sample). Participants had a significantly greater BMI in Sweden and a significantly smaller BMI in Denmark, $F(2, 961) = 16.13$, $p < .001$, $\omega^2 = .030$.

2.2. Measures

The questionnaires which were not available in Danish, Portuguese, and Swedish were translated in the respective languages following the back-translation technique (Brislin, 1970). One researcher translated the scale into the new language as the first step. Then, the translated version was translated back into English by another researcher. Finally, differences between the original scale and the back translation were discussed and resolved by the two translators involved in the project. The factor structure of all translated measures (i.e., the IES-2 and the RSES in Danish and Swedish) have been assessed (the results are presented in Supplementary Tables 1–4). To assess understanding of the questions and their face validity (Streiner & Norman, 2008), the translation procedure was followed by a pilot testing of the questionnaires in the target audience. Two boys and two girls from 12 to 19 years old were recruited by country. They took part individually in an interview with a researcher. The researcher read each item out loud to the participants and asked them if the questions made sense and were clear and easy to understand. These students indicated that all BAS-2 items made sense and were clear and easy to understand.

2.2.1. Demographics

Participants provided demographic information including sex, age, years of schooling, height, and weight. Self-reported height and weight were used to calculate the participants' BMI.

2.2.2. Body appreciation

Participants answered the Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015a), a 10-item scale measuring positive body image. All items are answered on a 5-point scale, ranging from 1 (Never) to 5 (Always). The BAS-2 is composed of one dimension with good internal reliability (Cronbach $\alpha = .91$ –.94) and 3-week stability, $r = .90$ in samples of college and community women and men (Tylka & Wood-Barcalow, 2015a; Webb, 2015). Halliwell et al. (2015) found good internal reliability (Cronbach $\alpha = .94$ –.95) in BAS-2 scores among a group of 14- and 15-year-old girls.

2.2.3. Self-esteem

Participants completed the 10-item Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The already validated Portuguese version (Pechorro, Marôco, Poiares, & Vieira, 2011) was used in Portugal. Items are rated on a 4-point scale, ranging from 1 (strongly agree) to 4 (strongly disagree). The RSES is composed of one dimension with both good internal reliability (Cronbach $\alpha = .81$) and 1-week stability ($r = .82$) among a sample of male and female students (Fleming & Courtney, 1984). Bagley, Bolitho, and Bertrand (1997) found a good internal reliability estimate (Cronbach's $\alpha = .85$ –.90) for BAS-2 scores among a group of 12–19-year-old adolescents.

2.2.4. Psychological well-being

Participants completed the psychological well-being dimension of the KIDSCREEN-27 (Ravens-Sieberer et al., 2014). The KIDSCREEN-27 is a European cross-cultural and standardized instrument, developed within the European project "Screening and Promotion for Health-Related Quality of Life in Children and Adolescents – A European Public Health Perspective" (Ravens-Sieberer et al., 2014). It is available in 38 languages including Danish, Portuguese, and Swedish. The well-being dimension is composed of 7 items and the answers are reported on a 5-point scale assessing either frequency (from never to always) or intensity (from not at all to extremely). Its scores have been shown to yield good internal reliability among children and adolescents from 8- to 18-years old (Robitail et al., 2007).

2.2.5. Intuitive eating

The 23-item Intuitive Eating Scale-2 (IES-2; Tylka & Van Diest, 2013) was used to assess intuitive eating. The already validated Portuguese version (Duarte, Pinto Gouveia, & Mendes, 2016) was used in Portugal. Items are rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The IES-2 is composed of four dimensions: Eating for Physical rather than Emotional Reasons; Unconditional Permission to Eat; Reliance on Hunger and Satiety Cues; and Body–Food Choice Congruence. The total scale and subscale scores were used in the present study. The total IES-2 scores have evidenced good internal reliability (Cronbach $\alpha = .85$ –.89) and 3-week stability ($r = .88$ –.92) in samples of college women and men (Tylka & Van Diest, 2013). Although no study has investigated the psychometric properties of the IES-2 among adolescents, Dockendorff, Petrie, Greenleaf, and Martin (2012) reported that the original IES could be used among young adolescents.

2.3. Procedures

Passive parental consent and active participant consent were obtained. Participants answered the questionnaire at school, during a class, using online web software. Each questionnaire was presented on a new page. The order of the scales was counterbalanced to control for order effects. Participants were also asked to provide their demographics. The study was approved by the ethics committee of the National Committee on Health Research Ethics in Denmark (number H-16044295), the Ethics Committee of the Faculty of Psychology and Education Sciences of the University of Porto in Portugal (reference 6-05/2016), and the Ethical Committee at Lund University in Sweden (number 2016/264).

2.4. Statistical analyses

Our analyses were organized in four sections. First, in order to test the BAS-2's construct validity (i.e., its factor structure and item-factor loadings), confirmatory factor analyses (CFAs) were performed using the lavaan package (Rosseel, 2012) from the R

Table 1
Means, standard deviations, and Cronbach's alphas of all measures across country and sex.

	Denmark			Portugal			Sweden		
	Girls		Boys	Girls		Boys	Girls		Boys
	M (SD)	Cronbach α [95% CI]	M (SD)	M (SD)	Cronbach α [95% CI]	M (SD)	M (SD)	Cronbach α [95% CI]	M (SD)
BAS-2	3.73 (0.79)	.93 [.91–.95]	4.13 (0.72)	3.81 (0.83)	.94 [.93–.95]	4.31 (0.65)	3.55 (0.91)	.95 [.94–.96]	4.13 (0.81)
RSES	2.87 (0.54)	.88 [.84–.92]	3.21 (0.46)	2.90 (0.61)	.88 [.87–.90]	3.19 (0.56)	2.75 (0.60)	.90 [.88–.92]	3.15 (0.54)
KIDSCREEN	3.83 (0.69)	.88 [.84–.92]	4.13 (0.52)	3.68 (0.74)	.86 [.84–.89]	4.09 (0.67)	3.58 (0.87)	.92 [.90–.94]	4.06 (0.70)
IES-2	3.54 (0.51)	.79 [.73–.86]	3.72 (0.49)	3.40 (0.55)	.79 [.75–.82]	3.63 (0.53)	3.52 (0.64)	.87 [.84–.90]	3.68 (0.59)
UPE	3.52 (0.86)	.77 [.69–.85]	3.66 (0.69)	3.18 (0.87)	.69 [.63–.75]	3.28 (0.91)	3.37 (0.95)	.80 [.75–.85]	3.52 (0.95)
EPR	3.59 (0.90)	.86 [.81–.91]	3.75 (0.82)	3.28 (1.04)	.87 [.85–.90]	3.66 (1.03)	3.45 (0.92)	.81 [.76–.86]	3.80 (0.87)
RHSC	3.67 (0.69)	.79 [.71–.86]	3.85 (0.86)	3.58 (0.84)	.85 [.83–.88]	3.84 (0.80)	3.64 (0.90)	.89 [.86–.92]	3.72 (1.07)
B-FCC	3.26 (0.86)	.84 [.78–.91]	3.52 (0.88)	3.58 (0.79)	.76 [.71–.81]	3.70 (0.81)	3.63 (0.80)	.83 [.78–.88]	3.59 (1.01)

Note. N = 1012; n = 79 Danish girls; n = 296 Portuguese girls; n = 217 Portuguese boys; n = 155 Swedish girls; n = 215 Swedish boys; BAS-2 = Body Appreciation Scale-2; RSES = Rosenberg Self-Esteem Scale; KIDSCREEN = psychological well-being dimension; IES-2 = Intuitive Eating Scale-2; UPE = Unconditional Permission to Eat; EPR = Eating for Physical rather than Emotional Reasons; RHSC = Reliance on Hunger and Satiety Cues; B-FCC = Body–Food Choice Congruence; M = Mean; SD = Standard Deviation; CI = Confidence Interval.

software (R Core Team, 2013). The CFAs were conducted on the boy and girl samples from the three countries (Denmark, Portugal, and Sweden). Following the recommendations from Hu and Bentler (1999); Jöreskog and Sörbom (1989), and Kline (2011), the model fit was interpreted by using the Chi-square (χ^2), the Comparative Fit Index (CFI; Bentler, 1990), the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), with a 90% confidence interval, and the Standardized Root Mean Square Residual (SRMR; Jöreskog & Sörbom, 1989). In agreement with Marsh, Wen, and Hau (2004) and Chen, Curran, Bollen, Kirby, and Paxton (2008), the global model fit based on the constellation of these indices rather than a universal cut-off value for a particular index was interpreted.

Multi-group CFAs were conducted to test the invariance of the BAS-2 across sex and country by using the “step-down” methodology (Brown, 2006). The multi-group CFAs were realized with the semTools package (Pornprasertmanit, Miller, Schoemann, & Rosseel, 2016). In the first step, all parameters were freely estimated across groups in order to establish a baseline unconstrained model (configural invariance; Horn & McArdle, 1992). Next, factor loadings were constrained to equality across groups (metric invariance; Horn & McArdle, 1992). In the following step, item intercepts were constrained to be equal (scalar invariance; Steenkamp & Baumgartner, 1998). If metric or scalar invariance was rejected, less strict invariance hypotheses were assessed (the partial metric or the partial scalar invariance respectively; Cheung & Rensvold, 2002). Differences between nested multi-group models were estimated by using the difference in CFI. If the $\Delta CFI \leq .01$, the null hypothesis of invariance should not be rejected (Cheung & Rensvold, 2002). If measurement invariance was evidenced, a two-way analysis of variance (ANOVA) was planned to compare the level of positive body image across sex and country.

Second, we assessed the internal consistency reliability of the BAS-2's scores in each sample. Last, we tested the convergent validity of the BAS-2 scores using bivariate correlations (Hmisc package; Harrell, 2017) between BAS-2 and self-esteem, psychological well-being, intuitive eating, and BMI.

3. Results

Prior to data analyses, participants with missing data (124 participants) were discarded from the sample, resulting in 1012 observations available for analyses (89% of participants). Means, standard deviations, and Cronbach's alphas of all scales and subscales are displayed in Table 1. Skewness and kurtosis, retrieved with the psych package (Revelle, 2017), and Mardia's multivariate tests (Mardia, 1970), computed with the MVN package (Korkmaz, Goksuluk, & Zararsiz, 2014), were examined to assess normality assumptions. Results indicated that the data were neither univariate nor multivariate normally distributed.

3.1. Confirmatory factor analyses

CFAs were conducted using the Satorra-Bentler chi-square which is robust to non-normality distributed data (Satorra & Bentler, 1988). The results of all CFAs are displayed in Tables 2 and 3. The results indicated that the unidimensional model fit the data well in the three countries: for both boys and girls in Denmark, Portugal, and Sweden. All indicators loaded significantly on the latent factor ($p < .001$ except for Item 8 in the Danish boy sample for which $p = .002$). Item-factor loadings were above .60 except Item 5 in the Danish, Portuguese, and Swedish girl and Portuguese boy samples and Item 8 in the Danish boy sample (see Table 3). Item 5 had the lowest factor loading, ranging from .44 to .70. However, we

Table 2
Fit indices of the BAS-2 by sex and country.

	Satorra-Bentler χ^2	df	Scale correction	Robust CFI	Robust TLI	Robust RMSEA	Robust RMSEA CI	Robust SRMR
Denmark								
Girls (<i>n</i> = 79)	50.36	35	1.14	.97	.96	.08	[.01, .13]	.05
Boys (<i>n</i> = 50)	49.71	35	1.32	.91	.89	.11	[.00, .17]	.06
Portugal								
Girls (<i>n</i> = 296)	96.61	35	1.25	.97	.96	.09	[.07, .11]	.03
Boys (<i>n</i> = 217)	62.15	35	1.47	.97	.96	.07	[.04, .10]	.04
Sweden								
Girls (<i>n</i> = 155)	70.11	35	1.27	.97	.96	.09	[.06, .12]	.03
Boys (<i>n</i> = 215)	72.80	35	1.59	.96	.95	.09	[.06, .12]	.04

Note. *df* = degree of freedom; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation; CI=Confidence Interval; SRMR = Standardized Root Mean Square Residual.

Table 3
Standardized item-factor loadings for the BAS-2 among boys and girls in Denmark, Portugal, and Sweden.

Items	Denmark		Portugal		Sweden	
	Girls	Boys	Girls	Boys	Girls	Boys
1. I respect my body.	.79	.67	.68	.73	.76	.84
2. I feel good about my body.	.68	.76	.88	.86	.90	.84
3. I feel that my body has at least some good qualities.	.69	.76	.74	.60	.80	.80
4. I take a positive attitude towards my body.	.86	.86	.83	.83	.90	.85
5. I am attentive to my body's needs.	.55	.70	.56	.44	.59	.64
6. I feel love for my body.	.88	.94	.90	.77	.87	.71
7. I appreciate the different and unique characteristics of my body.	.81	.76	.77	.72	.82	.83
8. My behavior reveals my positive attitude toward my body; for example, I hold my head high and smile.	.72	.47	.67	.68	.74	.79
9. I am comfortable in my body.	.84	.82	.90	.84	.92	.85
10. I feel like I am beautiful even if I am different from media images of attractive people (e.g., models, actresses/actors).	.77	.64	.78	.69	.80	.76

Note. *N* = 1012; *n* = 79 Danish girls; *n* = 50 Danish boys; *n* = 296 Portuguese girls; *n* = 217 Portuguese boys; *n* = 155 Swedish girls; *n* = 215 Swedish boys.

kept Item 5 as its loading was above the .32 threshold (Tabachnick & Fidell, 2001).

3.2. Measurement invariance

Multi-group CFAs were performed on the BAS-2 across both sex and country. The results displayed in Table 4 and Supplementary Table 5 indicate that there was evidence of metric and partial scalar invariance across Denmark and Portugal (metric Δ CFI = .003, scalar Δ CFI = .024, and partial scalar Δ CFI = .008); Denmark and Sweden (metric Δ CFI = .001, scalar Δ CFI = .016, and partial scalar Δ CFI = .008); and Portugal and Sweden (metric Δ CFI = .004, scalar Δ CFI = .020, and partial scalar Δ CFI = .007).

Next, multi-group CFAs on the girl and boy samples from each country were carried out in order to test whether the BAS-2 was invariant across sexes in the three languages. The results of the multi-group CFAs on BAS-2 showed that the BAS-2 is metric and partial scalar invariant across boys and girls in Denmark (metric Δ CFI = .003, scalar Δ CFI = .024, and partial scalar Δ CFI = .007) and metric and scalar invariant across boys and girls in Portugal (metric Δ CFI = .000, and scalar Δ CFI = .001) and Sweden (metric Δ CFI = .008, and scalar Δ CFI = .006; see Supplementary Table 5).

3.3. Internal consistency reliability

Scores on the Danish, Portuguese, and Swedish versions of the BAS-2 were shown to be internally consistent for both boys (α = .92, .91, and .94, respectively) and girls (α = .93, .94, and .94, respectively).

3.4. Convergent validity

Prior to assessing the convergent validity of the BAS-2, we performed factor analyses on all translated instruments (RSES and IES-2 in Danish and Swedish) to assess their factor structure. The factor structure of the Portuguese version of the IES-2 was also assessed, as this measure has not previously been used among

adolescents (details regarding factor loadings and fit indices are presented in Supplementary Tables 3 and 4). Convergent validity was assessed by looking at the correlations between the BAS-2 and self-esteem, psychological well-being, intuitive eating, and BMI for boys and girls in Denmark, Portugal, and Sweden separately. The results showed similar patterns in the three countries for both boys and girls (see Tables 5–7). For girls, body appreciation was moderately to strongly positively correlated with self-esteem, psychological well-being, and intuitive eating (Cohen, 1988). All these relationships were significant at $p < .001$. There was a weak negative relationship between the BAS-2 and BMI in the three countries; however, this relationship was significant in Portugal ($r = .14$, $p = .015$), but not in Denmark ($r = .19$, $p = .117$) or Sweden ($r = .15$, $p = .077$), which may be due to the larger sample size in Portugal. For boys, body appreciation was moderately to strongly positively correlated with self-esteem, psychological well-being, and intuitive eating – although the relationship between body appreciation and intuitive eating was weaker in Portugal ($z = 2.57$, $p = .010$) and Sweden ($z = 2.03$, $p = .042$). All these relationships are significant at $p < .001$. The relationship between body appreciation and BMI for boys was also less clear, as a weak negative relationship was found in Portugal ($r = -.33$, $p < .001$), but there was no statistically significant relationship either in Denmark or in Sweden.

3.5. Group comparisons

A two-way ANOVA was conducted to assess the differences in terms of body appreciation between sex and country. Results show that there was a significant effect of sex, $F(1, 1006) = 105.45$, $p < .001$, $\omega^2 = .093$. Boys ($M = 4.21$, $SD = 0.73$) had a higher level of body appreciation than girls ($M = 3.72$, $SD = 0.85$). There was also a significant effect of country, $F(2, 1006) = 3.42$, $p = .033$, $\omega^2 = .004$, on the level of body appreciation.

As the homogeneity of variance was not respected, a Games-Howell post-hoc test (Field, 2013) was carried out. Results showed that the level of body appreciation was not significantly different across the three countries: Denmark ($M = 3.89$, $SD = 0.78$), Portugal

Table 4
Multi-group CFAs testing for measurement invariance between sex and country.

		Metric invariance	Scalar invariance	Non-invariant intercepts
Country	Denmark - Portugal	Yes	No	Items 1 & 5
	Denmark - Sweden	Yes	No	Item 6
	Portugal - Sweden	Yes	No	Items 1 & 3
Sex by country	Danish boys -Danish girls	Yes	No	Items 3 & 8
	Portuguese boys - Portuguese girls	Yes	Yes	
	Swedish boys - Swedish girls	Yes	Yes	

Table 5
Bivariate correlations for Danish boys and girls.

	(1)	(2)	(3)	(4)	(5)
(1) Body appreciation		.82***	.70***	.52***	-.19
(2) Self-esteem	.60***		.60***	.52***	-.04
(3) Psychological well-being	.61***	.50***		.48***	-.08
(4) Intuitive eating	.57***	.41**	.42**		-.19
(5) Body mass index	-.07	-.05	-.10	-.17	

Note. Correlations above the diagonal correspond to the girl sample ($n = 79$); correlations below the diagonal correspond to the boy sample ($n = 50$).

** $p < .01$.

*** $p < .001$.

Table 6
Bivariate correlations for Portuguese boys and girls.

	(1)	(2)	(3)	(4)	(5)
(1) Body appreciation		.67***	.59***	.32***	-.14*
(2) Self-esteem	.50***		.62***	.34***	-.04
(3) Psychological well-being	.54***	.55***		.35***	-.04
(4) Intuitive eating	.23***	.33***	.39***		-.13*
(5) Body mass index	-.33***	-.11	-.15*	-.14*	

Note. Correlations above the diagonal correspond to the girl sample ($n = 296$); correlations below the diagonal correspond to the boy sample ($n = 217$).

* $p < .05$.

*** $p < .001$.

Table 7
Bivariate correlations for Swedish boys and girls.

	(1)	(2)	(3)	(4)	(5)
(1) Body appreciation		.79***	.66***	.57***	-.15
(2) Self-esteem	.62***		.72***	.55***	-.12
(3) Psychological well-being	.64***	.63***		.53***	-.01
(4) Intuitive eating	.31***	.36***	.37***		-.17*
(5) Body mass index	-.04	.10	.01	.02	

Note. Correlations above the diagonal correspond to the girl sample ($n = 155$); correlations below the diagonal correspond to the boy sample ($n = 215$).

* $p < .05$.

*** $p < .001$.

($M = 4.01$, $SD = 0.79$), and Sweden ($M = 3.89$, $SD = 0.90$). The interaction between sex and country was nonsignificant, $F(2, 1006) = 0.75$, $p = .475$, $\omega^2 = .000$.

4. Discussion

The main objective of the study was to accrue psychometric evidence for the BAS-2 among adolescents and young adults in three countries: Denmark, Portugal, and Sweden. Consistent with results from other studies examining the factor structure of the BAS-2 within different countries (Alcaraz-Ibáñez et al., 2017; Alleva et al., 2016; Atari, 2016; Halliwell et al., 2017; Jovic et al., 2016; Kertechian & Swami, 2017; Namatame et al., 2017; Pálmarsdóttir & Karlsdóttir, 2016; Razmus & Razmus, 2017; Swami, García et al., 2017; Swami & Ng, 2015; Swami et al., 2016; Swami, García et al., 2017; Tylka & Wood-Barcalow, 2015a), our results showed that the BAS-2 is composed of a single factor within Denmark, Portugal, and Sweden. The 10 items of the BAS-2 were found to load on one latent factor in both sexes in these three countries. These results are similar to those found by Tylka and Wood-Barcalow (2015a) in the

English validation of the BAS-2, who also found that the 10 items of the English version of the BAS-2 loaded on one latent variable. Overall, the present study's findings provide support for the use of the BAS-2 among adolescent boys and girls from Denmark, Portugal, and Sweden.

Item 5 had a lower factor loading ranging from .44 to .70. However, Item 5 was kept as its loading was above the .32 threshold (Tabachnick & Fidell, 2001), and Item 5 has been found to have the lowest factor loading in other languages: .33 in Dutch women (Alleva et al., 2016), .55 in the French female sample (Kertechian & Swami, 2017), and .65 in Spanish (Swami, García et al., 2017).

The invariance of the scale was assessed across sex and country. This is the first time that the cross-cultural invariance of the BAS-2 has been examined. It was found that the BAS-2 is partially scalar invariant across Denmark, Portugal, and Sweden, indicating that the BAS-2 is equivalent in these three languages. Hence, the scores on the BAS-2 can be compared between these three countries. Regarding sex invariance, it was found that the scale is partially scalar invariant between boys and girls in Denmark and scalar invariant between boys and girls in Portugal and Sweden,

which enables sex comparisons. These results are in line with previous findings of sex invariance reported in other validation articles of the BAS-2 within other countries (Kertechian & Swami, 2017; Razmus & Razmus, 2017; Swami et al., 2016; Swami, García et al., 2017). In the original validation of the BAS-2, Tylka and Wood-Barcalow (2015a) also examined sex invariance and found that the BAS-2 was invariant among men and women.

Results regarding the convergent validity of the BAS-2's scores were found to be very similar in the three countries investigated. Body appreciation is positively associated with self-esteem, psychological well-being, and intuitive eating for both boys and girls from Denmark, Portugal, and Sweden. These findings are consistent with previously reported results indicating a positive relationship between BAS-2 and self-esteem (e.g., Atari, 2016; Swami, García et al., 2017; Swami & Ng, 2015) and between BAS-2 and intuitive eating (Tylka & Wood-Barcalow, 2015a) in different countries than the ones investigated in the present study. Although Alleva et al. (2016) and Swami et al. (2016) investigated the relationship between BAS-2 and optimistic life orientation (Scheier, Carver, & Bridges, 1994) and between BAS-2 and life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985) respectively, the relationship between BAS-2 and psychological well-being assessed via the KIDSCREEN-27 has not yet been studied. Regarding the relationship between BAS-2 and BMI, different patterns were observed: there is a negative relationship for boys and girls in Portugal, but no significant difference was found in Denmark and Sweden. Although most studies have found a negative relationship between body appreciation and BMI in various countries (e.g., Razmus & Razmus, 2017; Swami, García et al., 2017), some have found no relationship among men or women (e.g., Swami, García et al., 2017; Swami & Ng, 2015; Swami et al., 2016).

In the last step of our analyses, differences between sex and country were investigated. As in previous comparisons between men and women, we found that boys have higher body appreciation than girls, with a moderate effect size (e.g., Atari, 2016; Kertechian & Swami, 2017; Tylka & Wood-Barcalow, 2015a). Our results indicated that the difference between countries was marginal with a small effect size. Although these findings need replication across different cultures before firm conclusions can be drawn, they suggest that cross-cultural differences on the level of body appreciation among adolescents and young adults may not be large.

Our recruitment strategy was limited in some ways. Participants were assessed at school, and as only a few schools from each country (i.e., four in Denmark, six in Portugal, and six in Sweden) participated in the study, our sample is probably not representative of the general adolescent and young adult populations in these three countries. Although some participants were 18 or 19 years old, our study did not include full adult samples, which may limit the generalizability of our results to adult populations. Future studies could investigate the psychometric properties of the BAS-2 in Danish, Portuguese, and Swedish among an adult population. The IES-2 has not previously been used among adolescents which may be considered an additional limitation. However, previous studies found that the original IES is an appropriate measure of intuitive eating among both adults and adolescents (Andrew, Tiggemann, & Clark, 2016; Dockendorff et al., 2012). Moreover, the results of the factor analyses on the IES-2 that we conducted among our three samples upheld its factor structure. Many variables have been associated with body appreciation, although additional studies could investigate the association between the BAS-2 and other concepts such as body acceptance by others (Avalos & Tylka, 2006), body flexibility (Sandoz, Wilson, Merwin, & Kellum, 2013), or physical well-being. Due to the recommendation to have a 5:1 or 10:1 ratio of participants by parameters to estimate (Bentler & Chou, 1987; Bollen, 1989) or a 10:1 ratio of participants per variables (Nunnally, 1967), the smaller sample size in Denmark can

be seen as an additional limitation. However, Wolf, Harrington, Clark, and Miller (2013) found that a sample size of 70 participants was sufficient with a one-factor model composed of eight indicators and factor loadings of .50. Their results also show that a sample size of 40 participants was large enough for the same model when the factor loadings were around .65. Therefore, we are confident that, in regards to the results of Wolf et al. (2013), the smaller sample size in Denmark do not limit our findings.

In conclusion, this study supports the psychometric properties of the BAS-2: it can be used with confidence among adolescents and young adults from 12 to 19 years old in Denmark, Portugal, and Sweden, and the scores across countries and across boys and girls can be compared. Along with previous validation studies among children (Halliwell et al., 2017) and adults (Tylka & Wood-Barcalow, 2015a), these results enable researchers to investigate the development of positive body image over the life span (Tiggemann, 2015).

Conflicts of interest

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Appendix A. Body Appreciation Scale-2 in Danish

Instructions for participants: Vær venlig og angiv om svar er sandt aldrig, sjældent, nogen gange, ofte eller altid

- 1 Jeg respekterer min krop
- 2 Jeg trives med min krop
- 3 Jeg synes at min krop har i det mindste nogen gode kvaliteter
- 4 Jeg har en positiv indstilling til min krop
- 5 Jeg er opmærksom på min krops behov
- 6 Jeg kan godt lide min krop
- 7 Jeg kan godt lide min krops særlige udseende
- 8 Jeg opfører mig så min glæde ved min krop kan ses, for eksempel holder jeg mit hoved højt og smiler
- 9 Jeg føler mig godt tilpas i min krop
- 10 Jeg synes jeg er smuk selv om jeg ikke ser ud som dem i ugebladende (modeller og skuespillere).

Scoring: 1 = Aldrig; 2 = Sjældent; 3 = Nogen gange; 4 = Ofte; 5 = Altid.

Appendix B. Body Appreciation Scale-2 in Portuguese

Instructions for participants: Por favor, indica até que ponto cada uma das afirmações é verdadeira em relação a ti, escolhendo uma das seguintes opções: nunca, raramente, às vezes, frequentemente, ou sempre

- 1 Respeito o meu corpo.
- 2 Sinto-me bem com o meu corpo.
- 3 Sinto que o meu corpo tem algumas qualidades.
- 4 Tenho uma atitude positiva em relação ao meu corpo.
- 5 Estou atento(a) às necessidades do meu corpo.
- 6 Sinto amor pelo meu corpo.
- 7 Aprecio as várias características únicas do meu corpo.
- 8 O meu comportamento revela a atitude positiva que tenho em relação ao meu corpo; por exemplo, mantenho a cabeça erguida e sorrio.
- 9 Sinto-me confortável no meu corpo.
- 10 Sinto-me bonito(a) mesmo sendo diferente das imagens de pessoas atraentes que aparecem nos meios de comunicação social (ex. modelos, atrizes/atores).

Scoring: 1 = Nunca; 2 = Raramente; 3 = Às vezes; 4 = Frequentemente; 5 = Sempre.

Appendix C. Body Appreciation Scale-2 in Swedish

Instructions for participants: Var god, ange om påståendet är sant om du aldrig, sällan, ibland, ofta eller alltid:

- 1 Jag respekterar min kropp
- 2 Jag trivs med min kropp
- 3 Jag tycker att min kropp har åtminstone några bra egenskaper
- 4 Jag har en positiv inställning till min kropp
- 5 Jag är uppmärksam på min kropps behov
- 6 Jag älskar min kropp
- 7 Jag uppskattar min kropps olika och unika egenskaper
- 8 Mitt beteende visar min positiva inställning till min kropp, till exempel sträcker jag på mig och ler
- 9 Jag är bekväm i min kropp
- 10 Jag tycker att jag är vacker även om jag inte ser ut som attraktiva människor (t ex modeller, skådespelare) på bilder i media

Scoring: 1 = Aldrig; 2 = Sällan; 3 = Ibland; 4 = Ofta; 5 = Alltid.

Appendix D. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.bodyim.2018.04.004>.

References

- Alcaraz-Ibáñez, M., Cren Chiminazzo, J. G., Sicilia Camacho, Á., & Teixeira Fernandes, P. (2017). Examining the psychometric properties of the Body Appreciation Scale-2 in Brazilian adolescents. *Psychology, Society, & Education*, 9, 505–515. <http://dx.doi.org/10.25115/psye.v9i3.1101>
- Alexias, G., Togas, C., & Mellon, R. (2016). Psychometric properties of the Greek version of the Body Appreciation Scale. *Hellenic Journal of Psychology*, 13, 73–92.
- Alleva, J. M., Martijn, C., Veldhuis, J., & Tylka, T. L. (2016). A Dutch translation and validation of the Body Appreciation Scale-2: An investigation with female university students in the Netherlands. *Body Image*, 19, 44–48. <http://dx.doi.org/10.1016/j.bodyim.2016.08.008>
- Andrew, R., Tiggemann, M., & Clark, L. (2016). Predictors and health-related outcomes of positive body image in adolescent girls: A prospective study. *Developmental Psychology*, 52, 463. <http://dx.doi.org/10.1037/dev0000095>
- Atari, M. (2016). Factor structure and psychometric properties of the Body Appreciation Scale-2 in Iran. *Body Image*, 18, 1–4. <http://dx.doi.org/10.1016/j.bodyim.2016.04.006>
- Atari, M., Akbari-Zardkhaneh, S., Mohammadi, L., & Soufiabadi, M. (2015). The factor structure and psychometric properties of the Persian version of Body Appreciation Scale. *American Journal of Applied Psychology*, 3, 62–66.
- Atari, M., Jamali, R., Bahrami-Ehsan, H., & Mohammadi, L. (2017). Development and validation of Adolescent Comparative Body and Appearance Satisfaction Scale (ACBASS). *Current Psychology*, 3, 61–70. <http://dx.doi.org/10.1007/s12144-016-9452-0>
- Avalos, L. C., & Tylka, T. L. (2006). Exploring a model of intuitive eating with college women. *Journal of Counseling Psychology*, 53, 486–497. <http://dx.doi.org/10.1037/e527492007-001>
- Avalos, L. C., Tylka, T. L., & Wood-Barcalow, N. (2005). The Body Appreciation Scale: Development and psychometric evaluation. *Body Image*, 2, 285–297. <http://dx.doi.org/10.1016/j.bodyim.2005.06.002>
- Bagley, C., Bolitho, F., & Bertrand, L. (1997). Norms and construct validity of the Rosenberg Self-Esteem Scale in Canadian high school populations: Implications for counselling. *Canadian Journal of Counselling*, 31, 82–92.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107, 238–246. <http://dx.doi.org/10.1037/0033-2909.107.2.238>
- Bentler, P. M., & Chou, C.-P. (1987). Practical issues in structural modeling. *Sociological Methods & Research*, 16, 78–117. <http://dx.doi.org/10.1177/0049124187016001004>
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1, 185–216. <http://dx.doi.org/10.1177/135910457000100301>
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford Press.
- Chen, F., Curran, P. J., Bollen, K. A., Kirby, J., & Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociological Methods & Research*, 36, 462–494. <http://dx.doi.org/10.1177/0049124108314720>
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9, 233–255. <http://dx.doi.org/10.1207/s15328007sem0902.5>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2 ed.). New York: Academic Press.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71–75. <http://dx.doi.org/10.1207/s15327752jpa4901.13>
- Dockendorff, S. A., Petrie, T. A., Greenleaf, C. A., & Martin, S. (2012). Intuitive Eating Scale: An examination among early adolescents. *Journal of Counseling Psychology*, 59, 604–611. <http://dx.doi.org/10.1037/a0029962>
- Duarte, C., Pinto Gouveia, J., & Mendes, A. (2016). Psychometric properties of the Intuitive Eating Scale-2 and association with binge eating symptoms in a Portuguese community sample. *International Journal of Psychology and Psychological Therapy*, 16, 329–341.
- Eisenberg, M. E., Neumark-Sztainer, D., & Paxton, S. J. (2006). Five-year change in body satisfaction among adolescents. *Journal of Psychosomatic Research*, 61, 521–527. <http://dx.doi.org/10.1016/j.jpsychores.2006.05.007>
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics: (And sex and drugs and rock 'n' roll)* (4 ed.). London: Sage.
- Fleming, J. S., & Courtney, B. E. (1984). The dimensionality of self-esteem: II. Hierarchical facet model for revised measurement scales. *Journal of Personality and Social Psychology*, 46, 404–421. <http://dx.doi.org/10.1037/0022-3514.46.2.404>
- Frisén, A., & Holmqvist, K. (2010). What characterizes early adolescents with a positive body image? A qualitative investigation of Swedish girls and boys. *Body Image*, 7, 205–212. <http://dx.doi.org/10.1016/j.bodyim.2010.04.001>
- Halliwel, E., Jarman, H., McNamara, A., Risdon, H., & Jankowski, G. (2015). Dissemination of evidence-based body image interventions: A pilot study into the effectiveness of using undergraduate students as interventionists in secondary schools. *Body Image*, 14, 1–4. <http://dx.doi.org/10.1016/j.bodyim.2015.02.002>
- Halliwel, E., Jarman, H., Tylka, T., & Slater, A. (2017). Adapting the Body Appreciation Scale-2 for Children: A psychometric analysis of the BAS-2C. *Body Image*, 21, 97–102. <http://dx.doi.org/10.1016/j.bodyim.2017.03.005>
- Harrell, F. E., Jr. (2017). *Hmisc: Harrell miscellaneous. R package version 4.0-3*. Retrieved 16/08/2017, from <https://CRAN.R-project.org/package=Hmisc>.
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations* (2 ed.). Thousand Oaks, CA: Sage.
- Holsen, I., Jones, D. C., & Birkeland, M. S. (2012). Body image satisfaction among Norwegian adolescents and young adults: A longitudinal study of the influence of interpersonal relationships and BMI. *Body Image*, 9, 201–208. <http://dx.doi.org/10.1016/j.bodyim.2012.01.006>
- Horn, J. L., & McArdle, J. J. (1992). A practical and theoretical guide to measurement invariance in aging research. *Experimental Aging Research*, 18, 117–144. <http://dx.doi.org/10.1080/03610739208253916>
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Thousand Oaks: Sage Publications.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55. <http://dx.doi.org/10.1080/10705519909540118>
- Jöreskog, K. G., & Sörbom, D. (1989). *LISREL 7: A guide to the program and applications*. Chicago: SPSS.
- Jovic, M., Sforza, M., Jovanovic, M., & Jovic, M. (2016). The Acceptance of Cosmetic Surgery Scale: Confirmatory factor analyses and validation among Serbian adults. *Current Psychology*, 1–12. <http://dx.doi.org/10.1007/s12144-016-9458-7>
- Kertechian, S., & Swami, V. (2017). An examination of the factor structure and sex invariance of a French translation of the Body Appreciation Scale-2 in university students. *Body Image*, 21, 26–29. <http://dx.doi.org/10.1016/j.bodyim.2017.02.005>
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3 ed.). New York: Guilford.

- Korkmaz, S., Goksuluk, D., & Zararsiz, G. (2014). MVN: An R package for assessing multivariate normality. *The R Journal*, 6, 151–162. <http://dx.doi.org/10.1002/hfm.20355>
- Littleton, H. L., & Ollendick, T. (2003). Negative body image and disordered eating behavior in children and adolescents: What places youth at risk and how can these problems be prevented? *Clinical Child and Family Psychology Review*, 6, 51–66.
- Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57, 519–530. <http://dx.doi.org/10.1093/biomet/57.3.519>
- Marsh, H. W., Wen, Z., & Hau, K.-T. (2004). Structural equation models of latent interactions: Evaluation of alternative estimation strategies and indicator construction. *Psychological Methods*, 9, 275–300. <http://dx.doi.org/10.1037/1082-989X.9.3.275>
- Namatame, H., Uno, K., & Sawamiya, Y. (2017). Development of Japanese version of the Body Appreciation Scale-2. *The Japanese Journal of Psychology*, 92–99. <http://dx.doi.org/10.4992/jjpsy.88.16216>
- Nunnally, J. C. (1967). *Psychometric theory*. New York, NY: McGraw-Hill.
- Pálmarisdóttir, P. G., & Karlsdóttir, A. E. (2016). Psychometric properties of the Icelandic translation of the Body Appreciation Scale-2 Retrieved 27/08/2017, from. <http://skemman.is/en/item/view/1946/24746>
- Pechorro, P., Marôco, J., Póiares, C., & Vieira, R. X. (2011). Validação da Escala de Auto-Estima de Rosenberg com adolescentes Portugueses em contexto forense e escolar. *Arquivos de Medicina*, 25, 174–179. <http://dx.doi.org/10.1590/S1516-44462001000400008>
- Pornprasertmanit, S., Miller, P., Schoemann, A., & Rosseel, Y. (2016). *semTools: Useful tools for structural equation modeling. R package version 0.4-14* Retrieved 16/08/2017, from. <https://cran.r-project.org/web/packages/semTools/index.html>
- R Core Team. (2018). *R: A language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing.
- Ravens-Sieberer, U., Herdman, M., Devine, J., Otto, C., Bullinger, M., Rose, M., & Klasen, F. (2014). The European KIDSCREEN approach to measure quality of life and well-being in children: Development, current application, and future advances. *Quality of Life Research*, 23, 791–803. <http://dx.doi.org/10.1007/s11136-013-0428-3>
- Razmus, M., & Razmus, W. (2017). Evaluating the psychometric properties of the Polish version of the Body Appreciation Scale-2. *Body Image*, 23, 45–49. <http://dx.doi.org/10.1016/j.bodyim.2017.07.004>
- Revelle, W. (2017). *Psych: Procedures for psychological, psychometric, and personality research. R package version 1.7.5* Retrieved 12/05/2017 from. <https://CRAN.R-project.org/package=psych>
- Robitail, S., Ravens-Sieberer, U., Simeoni, M.-C., Rajmil, L., Bruil, J., Power, M., & Mazur, J. (2007). Testing the structural and cross-cultural validity of the KIDSCREEN-27 quality of life questionnaire. *Quality of Life Research*, 16, 1335–1345. <http://dx.doi.org/10.1007/s11136-007-9241-1>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rosseel, Y. (1863). *avaan: An R package for structural equation modeling. Journal of Statistical Software*, v048 <http://dx.doi.org/10.18637/jss.v048.i02>
- Sandoz, E. K., Wilson, K. G., Merwin, R. M., & Kellum, K. K. (2013). Assessment of body image flexibility: The Body Image-Acceptance and Action Questionnaire. *Journal of Contextual Behavioral Science*, 2, 39–48. <http://dx.doi.org/10.1016/j.jcbs.2013.03.002>
- Satorra, A., & Bentler, P. M. (1988). Scaling corrections for chi-square statistics in covariance structure analysis. In *American Statistical Association Proceedings of the business and economic section*. pp. 308–313. Washington, DC: American Statistical Association.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67, 1063–1078. <http://dx.doi.org/10.1037/0022-3514.67.6.1063>
- Von Soest, T., & Wichstrøm, L. (2009). Gender differences in the development of dieting from adolescence to early adulthood: A longitudinal study. *Journal of Research on Adolescence*, 19, 509–529. <http://dx.doi.org/10.1111/j.1532-7795.2009.00605.x>
- Steenkamp, J. B. E., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research*, 25, 78–107. <http://dx.doi.org/10.1086/209528>
- Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, 25, 173–180. http://dx.doi.org/10.1207/s15327906mbr2502_4
- Streiner, D. L., & Norman, G. R. (2008). *Health measurement scales: A practical guide to their development and use* (4 ed.). Hampshire, UK: Oxford University Press.
- Striegel-Moore, R. H., & Cachelin, F. M. (1999). Body image concerns and disordered eating in adolescent girls: Risk and protective factors. In N. G. Johnson, M. C. Roberts & J. Worell (Eds.), *Beyond appearance: A new look at adolescent girls* (pp. 85–108). Washington, DC: American Psychological Association.
- Swami, V., & Ng, S.-K. (2015). Factor structure and psychometric properties of the Body Appreciation Scale-2 in university students in Hong Kong. *Body Image*, 15, 68–71. <http://dx.doi.org/10.1016/j.bodyim.2015.06.004>
- Swami, V., Ng, S.-K., & Barron, D. (2016). Translation and psychometric evaluation of a Standard Chinese version of the Body Appreciation Scale-2. *Body Image*, 18, 23–26. <http://dx.doi.org/10.1016/j.bodyim.2016.04.005>
- Swami, V., Özgen, L., Gökçen, E., & Petrides, K. (2015). Body image among female university students in Turkey: Concurrent translation and validation of three body image measures. *International Journal of Culture and Mental Health*, 8, 176–191. <http://dx.doi.org/10.1080/17542863.2014.917117>
- Swami, V., García, A. A., & Barron, D. (2017). Factor structure and psychometric properties of a Spanish translation of the Body Appreciation Scale-2 (BAS-2). *Body Image*, 22, 13–17. <http://dx.doi.org/10.1016/j.bodyim.2017.05.002>
- Swami, V., Tudorel, O., Goian, C., Barron, D., & Vintila, M. (2017). Factor structure and psychometric properties of a Romanian translation of the Body Appreciation Scale-2. *Body Image*, 23, 61–68. <http://dx.doi.org/10.1016/j.bodyim.2017.08.001>
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4 ed.). Boston, MA: Allyn and Bacon.
- Tiggemann, M. (2015). Considerations of positive body image across various social identities and special populations. *Body Image*, 14, 168–176. <http://dx.doi.org/10.1016/j.bodyim.2015.03.002>
- Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38, 1–10. <http://dx.doi.org/10.1007/bf02291170>
- Tylka, T. L. (2013). Evidence for the Body Appreciation Scale's measurement equivalence/invariance between US college women and men. *Body Image*, 10, 415–418. <http://dx.doi.org/10.1016/j.bodyim.2013.02.006>
- Tylka, T. L., & Kroon Van Diest, A. M. (2013). The Intuitive Eating Scale-2: Item refinement and psychometric evaluation with college women and men. *Journal of Counseling Psychology*, 60, 137–153. <http://dx.doi.org/10.1037/a0030893>. [supp](http://dx.doi.org/10.1037/a0030893.supp)
- Tylka, T. L., & Wood-Barcalow, N. L. (2015a). The Body Appreciation Scale-2: Item refinement and psychometric evaluation. *Body Image*, 12, 53–67. <http://dx.doi.org/10.1016/j.bodyim.2014.09.006>
- Tylka, T. L., & Wood-Barcalow, N. L. (2015b). What is and what is not positive body image? Conceptual foundations and construct definition. *Body Image*, 14, 118–129. <http://dx.doi.org/10.1016/j.bodyim.2015.04.001>
- Webb, J. B. (2015). Body image flexibility contributes to explaining the link between body dissatisfaction and body appreciation in White college-bound females. *Journal of Contextual Behavioral Science*, 4, 176–183. <http://dx.doi.org/10.1016/j.jcbs.2015.06.001>
- Webb, J. B., Wood-Barcalow, N. L., & Tylka, T. L. (2015). Assessing positive body image: Contemporary approaches and future directions. *Body Image*, 14, 130–145. <http://dx.doi.org/10.1016/j.bodyim.2015.03.010>
- Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, 76, 913–934. <http://dx.doi.org/10.1177/0013164413495237>