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Abstract

The present study examined the factorial and construct validity of a Standard Chinese translation of the Body Appreciation Scale (BAS-2; Tylka & Wood-Barcalow, 2015b). Participants were 191 women and 154 men from mainland China who were resident in Hong Kong at the time of recruitment. Results of confirmatory factor analysis indicated that the one-dimensional model of the BAS-2, in which all 10 items loaded onto the same factor, had adequate fit and was invariant across sex. Body appreciation scores had good internal consistency and were significantly correlated with self-esteem and life satisfaction, and, in women, with weight discrepancy and body mass index. There were no significant differences in body appreciation scores between women and men. The present findings suggest that the Standard Chinese translation of the BAS-2 has the same one-dimensional factor structure as its parent scale and may facilitate cross-cultural studies of positive body image.

Keywords: Body appreciation, Positive body image, Cultural equivalence, Factorial validity, China

Positive body image is a multidimensional construct consisting of facets including body appreciation, body acceptance and love, and adaptive appearance investment (Tylka & Wood-Barcalow, 2015a). One widely-used measure of the former facet is the Body Appreciation Scale (BAS; Avalos, Tylka, & Wood-Barcalow, 2005), a 15-item scale with evidence of construct validity and internal consistency (Webb, Wood-Barcalow, & Tylka, 2015). However, one limitation of the BAS relates to the cross-cultural equivalence of its factor structure: while some studies support a one-dimensional structure (e.g., Swami, Stieger, Haubner, & Voracek, 2008), studies in some national contexts instead support a two-factor model (e.g., Ng, Barron, & Swami, 2015; Swami & Chamorro-Premuzic, 2008; Swami & Jaafar, 2012).

This lack of equivalence in the dimensionality of the BAS prevents effective cross-cultural comparisons of body appreciation. Motivated in part by this issue, as well as broader developments in the conceptualisation of body appreciation, Tylka and Wood-Barcalow (2015b) developed a revision of the scale, the 10-item BAS-2. In adults from the United States, Tylka and Wood-Barcalow reported that the BAS-2 has a one-dimensional factor structure that is invariant across sex. They also reported that BAS-2 scores have good test-retest reliability and construct validity. While the BAS-2 represents an advance on its parent scale, a vital next step is to examine its factorial equivalence in diverse national and cultural groups (Tiggemann, 2015).

Two studies have examined the factor structure of the BAS-2 outside the United States. Using exploratory factor analysis (EFA), Atari (2016) reported that a Persian translation of the BAS-2 had a one-dimensional factor structure in samples of female and male university students in Iran (Cronbach's α = .87-.89). Similarly, an earlier EFA study provided evidence for a one-dimensional model of a Cantonese

translation in female and male university students in Hong Kong (Cronbach's α = .90-.91). As in the United States, both studies showed that men had significantly higher body appreciation than women (Iran $d = 0.15$; Hong Kong $d = 0.19$) and that BAS-2 scores had good construct validity (i.e., significant correlations with self-esteem, life satisfaction, and body mass index [BMI] in women and BMI^2 in men).

However, as noted by Swami and Ng (2015), a limitation of the Cantonese translation of the BAS-2 is that its use is restricted to Cantonese-speaking populations (i.e., mainly Hong Kong, Macau, and Guangdong). Although the varieties of Chinese are sometimes described as dialects of a single Chinese language, the language varieties are often mutually unintelligible (DeFrancis, 1984). Indeed, there are between 7 and 13 main regional groups of Chinese (Kane, 2006), of which the most widely-used is Standard Chinese (also known as Modern Standard Mandarin or Pǔtōnghuà/□□□). Aside from being the sole official language of China and Taiwan, Standard Chinese is also an official language in Singapore and is widely-used by the Chinese diaspora elsewhere in Southeast Asia. The written form of Standard Chinese is based on simplified Chinese characters (*hànzi*/□□) that are understood by literate speakers of otherwise unintelligible dialects (Kane, 2006).

In order to facilitate wider use of the BAS-2 in Chinese-speaking populations, we report on the translation and validation of a Standard Chinese version of the scale. In terms of the scale's factorial validity, we used confirmatory factor analysis (CFA), as opposed to EFA, because there is a sufficient body of theory and empirical research that postulates a one-dimensional relationship pattern *a priori* (Swami & Ng, 2015). In addition, we examined whether the derived factorial model is invariant across sex. Finally, we examined the construct validity of the Standard Chinese version of the

BAS-2 by examining associations between body appreciation and self-esteem, life

satisfaction, and BMI/BMI^2 in both sexes, and with weight discrepancy in women.

Method

Participants

Participants were 191 women and 154 men from mainland China who were

working or studying at a university in Hong Kong at the time of recruitment.

Participants ranged in age from 16 to 47 years ($M = 22.41$, $SD = 5.30$) and in self-

reported BMI from 16.02 to 35.69 kg/m^2 ($M = 21.00$, $SD = 2.93$).

Measures

Body appreciation. Participants completed the 10-item BAS-2 (Tylka &

Wood-Barcalow, 2015b; see Appendix for items in English and Standard Chinese).

All items were rated on a 5-point scale, ranging from 1 (*Never*) to 5 (*Always*).

Weight discrepancy. To assess women's actual-ideal weight discrepancy, we

used the Photographic Figure Rating Scale (PFRS; Swami, Salem, Furnham, &

Tovée, 2008). The PFRS consists of 10 photographic images of women ranging from

emaciated to obese and participants are asked to rate the figure that most closely

matches their own body and the figure they would most like to possess on a 10-point

scale ranging from 1 (*Figure with the smallest body size*) to 10 (*Figure with the

largest body size*). Actual-ideal weight discrepancy was computed as the difference

between absolute current and ideal ratings, so that higher scores reflect greater weight

discrepancy. Previous work has shown that PFRS scores have good patterns of test-

retest reliability and construct validity (Swami et al., 2012). No male version of the

PFRS currently exists, so men were asked to skip this portion of the questionnaire.

Self-esteem. To measure self-esteem, we used Rosenberg's Self-Esteem Scale

(RSES; Rosenberg, 1965; Standard Chinese translation: Tian, 2006), a 10-item

measure of an individual's overall sense of self-worth. All items were rated on a 4-point scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*). One item was removed prior to analyses, as this has been found to improve internal consistency and construct validity of estimates for the Standard Chinese version of the RSES (Tian, 2006). In the present work, Cronbach's α for the 9-item measure was .82 in women and .83 in men.

Life satisfaction. Life satisfaction was measured using the 5-item Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), which assesses an individual's overall feelings of the quality of their lives. All items were rated on a 5-point scale, ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*), and scores for the Chinese version of this scale have good construct validity (Choy & Moneta, 2002). In the present study, Cronbach's α for the SWLS was .84 in women and men, respectively.

Procedures

Once ethics approval was obtained, we prepared Standard Chinese translations of the BAS-2, PFRS, and SWLS from the parent English versions using the standard back-translation technique (Brislin, 1970). Between June and December 2015, the study was advertised on campus locations and invited participation in a study on health and well-being from respondents who matched inclusion criteria (being from mainland China and fluent in Standard Chinese). Those who agreed to participate provided written informed consent and completed an anonymous paper-and-pencil version of the questionnaire in a private cubicle. The order of presentation of the scales above was pre-randomised for each participant. Participation was voluntary and respondents did not receive any remuneration for participation. Upon return of the

completed questionnaires, participants were provided with written debrief

information.

Statistical Analyses

Confirmatory factor analysis (CFA) was conducted using the Analysis of

Moment Structures Program (AMOS v.21; Arbuckle, 2012) to examine the fit of a

single-factor model where all items loaded onto a single latent variable. Standard

goodness-of-fit indices were selected *a priori* to assess the measurement models. The

normed model chi-square (χ^2_{normed}) is reported with lower values of the overall model

chi-square indicating goodness-of-fit. A χ^2_{normed} value of < 3.00 indicates good fit (Hu

& Bentler, 1999). 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 (Hu & Bentler, 1999). The standardised 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 $< .09$ (Hu & Bentler, 1999, p. 27). 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 (Hu & Bentler,

1999, p. 27). To determine whether the BAS-2 was invariant across sex, we tested for

invariance 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)

level (Chen, 2007). Finally, we examined sex differences in body appreciation scores

in the present dataset, and also compared scores with data from Swami and Ng

(2015).

Results

Confirmatory Factor Analysis

CFA was conducted on the 10 items of the BAS-2, where all items loaded onto a single latent variable. The standardised estimates of factor loadings for the best-fitting model were all good-to-excellent, with the exception of items #1 and 9 which were fair (see Figure 1). This one-dimensional structure provided an acceptable fit to the data: $\chi^2_M(32, N = 345) = 110.518$, $\chi^2_{normed} = 3.454$, CFI = .953, RMSEA = .084 (low = .068, high = .102), SRMR = .047. The unconstrained model had adequate fit for both sex sub-samples individually, $\chi^2_M(64, N = 345) = 165.540$, $\chi^2_{normed} = 2.587$, CFI = .941, RMSEA = .068 (low = .055, high = .081), SRMR = .051 (see Table 1 for further 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, $\Delta\chi^2(10) = 16.846$, $p = .078$. Finally, intercept invariance was evaluated, where all item-factor intercepts were constrained equally across participant sex and evaluated against the factor loading invariance model. Significant $\Delta\chi^2$ values ($p < .008$) and model fit changes (i.e., ΔCFI $\geq$ -.010 and ΔRMSEA $\geq$ .015 or ΔSRMR $\geq$ .010) indicate intercept non-invariance (Chen, 2007). According to the changes to the fit indices and $\Delta\chi^2$, intercept invariance was evident, $\Delta\chi^2(10) = 17.00$, $p = .074$. Therefore, from these data, we find acceptable evidence for the one-dimensional structure for the BAS-2 across sex.

Further Analyses

We calculated total body appreciation scores by taking the mean of all 10 items. These scores had adequate internal consistency in women ($\alpha = .89$) and men (α

= .86). There was no significant difference in body appreciation between women (M = 3.62, SD = 0.64) and men (M = 3.72, SD = 0.65), $t(343)$ = 1.45, p = .149, d = 0.16. In women, body appreciation was significantly and positively correlated with life satisfaction (r = .47, p < .001) and self-esteem (r = .45, p < .001), and negatively correlated with weight discrepancy (r = -.36, p < .001) and BMI (r = -.19, p = .009). In men, body appreciation was significantly and positively correlated with life satisfaction (r = .53, p < .001) and self-esteem (r = .48, p < .001). However, the correlation with BMI^2 failed to reach significance (r = -.13, p = .093).

We also obtained data from Swami and Ng (2015) of respondents who had completed the Cantonese version of the BAS-2 (women n = 457, men n = 417) and conducted a 2 x 2 analysis of covariance (ANCOVA; Version: Cantonese versus Standard Chinese; Sex: women versus men) with body appreciation scores as the dependent variable. The sample who completed the Cantonese version were significantly younger, $t(1212)$ = 7.99, p < .001, d = 0.46, and had lower BMIs, $t(1212)$ = 3.87, p < .001, d = 0.22, than those who completed the Standard Chinese version, so these variables were entered as covariates. The results of the ANCOVA showed no significant Version by Sex interaction, $F(1, 1205)$ = 0.08, p = .784, η_p^2 < .01. However, men had significantly higher body appreciation than women, $F(1, 1205)$ = 14.56, p < .001, η_p^2 = .01, and participants who completed the Standard Chinese version had significantly higher scores than those who completed the Cantonese version, $F(1, 1205)$ = 14.36, p < .001, η_p^2 = .01. In this analysis, covariate BMI was significant, $F(1, 1205)$ = 25.99, p < .001, η_p^2 = .02, but covariate age was not, $F(1, 1205)$ = 0.35, p = .552, η_p^2 < .01.

Discussion

Using CFA, we found that the one-dimensional model, in which all items loaded onto a single factor, had adequate fit in respondents who completed a Standard Chinese translation of the BAS-2. This finding is consistent with the parent model proposed by Tylka and Wood-Barcalow (2015b), as well findings in participants who completed Cantonese (Swami & Ng, 2015) and Persian (Atari, 2016) translations of the BAS-2. Moreover, scores on the Standard Chinese version of the BAS-2 have good internal consistency and convergent validity. Specifically, we found that body appreciation scores were significantly associated with life satisfaction and self-esteem, and, in women only, with weight discrepancy and BMI. Taken together, these findings suggest that the Standard Chinese version of the BAS-2 has good factorial and construct validity.

Our CFA results also showed that the one-dimensional model of body appreciation was invariant across sex. We found no significant difference in body appreciation scores between women and men. Although this contrasts with previous work, where men have been found to have significantly higher BAS-2 scores than women (Atari, 2016; Swami & Ng, 2015; Tylka & Wood-Barcalow, 2015b), it should also be noted the magnitude of the difference in those studies was small. Further, the fact that the BAS-2 had the same factor structure as reported by Swami and Ng (2015) allowed us to compare scores between participants who had completed Cantonese and Standard Chinese versions of the BAS-2. Results showed that the latter had significantly higher body appreciation, although the effect size of this difference was negligible. In practical, real-world terms, it might be argued that body appreciation scores were similar across both groups of respondents.

Future work could improve on the present design by replicating the present findings in samples of respondents who reside in mainland China or among other

samples fluent in Standard Chinese. It will also be important to provide further

evidence of validity for BAS-2 estimates in these samples, particularly in terms of

discriminant validity and test-retest reliability. In particular, the absence of a measure

of body dissatisfaction in men was a real limitation that could be rectified in future

work by including a measure of, for example, drive for muscularity. These issues

aside, the availability of a Standard Chinese version of the BAS-2 opens up

possibilities for examining positive body image in diverse cultural groups, as well as

for effective cross-cultural comparisons of body appreciation. While there remains a

need to examine the factor structure of translations of the BAS-2 in other languages,

emerging evidence suggests that the scale may offer a vital tool for scholars seeking

to understand body appreciation across cultures.

References

Atari, M. (2016). *Factor structure and psychometric properties of the Body Appreciation Scale-2 in Iran*. Manuscript submitted for publication.

Arbuckle, J. (2012). *AMOS 21 reference guide*. Meadville, PN: Amos Development Corporation.

Avalos, L. C., Tylka, T. L., & Wood-Barcalow, N. (2005). The Body Appreciation Scale: Development of psychometric evaluation. *Body Image*, *2*, 486-497. doi: 10.1016/j.bodyim.2005.06.002

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, *1*, 185-216. doi: 10.1177/135910457000100301

Brown, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen, & J. S. Long (Eds.), *Testing structural equation models* (pp. 445-455). Newbury Park, CA: Sage.

Chen, F. F. (2007). Sensitivity of goodness of fit indices to lack of measurement invariance. *Structural Equation Modeling*, *14*, 464-504. doi: 10.1207/s15328007sem1203_7

Choy, W. C. W., & Moneta, G. B. (2002). The interplay of autonomy and relatedness in Hong Kong Chinese single mothers. *Psychology of Women Quarterly*, *26*, 186-199. doi: 10.1111/1471-6402.t01-1-00002

DeFrancis, J. (1984). *The Chinese language: Fact and fantasy*. Honolulu, HI: University of Hawaii Press.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, *49*, 71-75. doi: 10.1207/s15327752jpa4901_13

Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indices in covariance structure

analysis: Conventional criteria versus new alternatives. *Structural Equation*

Modeling, *6*, 1-55. doi: 10.1080/10705519909540118

Kane, D. (2006). *The Chinese language: Its history and current usage*. North

Clarendon, VT: Tuttle Publishing.

Ng, S.-K., Barron, D., & Swami, V. (2015). Factor structure and psychometric

properties of the Body Appreciation Scale among adults in Hong Kong. *Body*

Image, *13*, 1-8. doi: 10.1016/j.bodyim.2014.10.009

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ:

Princeton University Press.

Swami, V., & Chamorro-Premuzic, T. (2008). Factor structure of the Body

Appreciation Scale among Malaysian women. *Body Image*, *5*, 409-413. doi:

10.1016/j.bodyim.2008.04.005

Swami, V., & Jaafar, J. L. (2012). Factor structure of the Body Appreciation Scale

among Indonesian women and men: Further evidence of a two-factor solution in

a non-Western population. *Body Image*, *9*, 539-542. doi:

10.1016/j.bodyim.2012.06.002

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. doi: 10.1016/j.bodyim.2015.06.004

Swami, V., Salem, N., Furnham, A., & Tovée, M. J. (2008). Initial examination of the

validity and reliability of the female Photographic Figure Rating Scale for body

image assessment. *Personality and Individual Differences*, *44*, 1752-1761. doi:

10.1016/j.paid.2008.02.002

Swami, V., Stieger, S., Harris, A. M., Nader, I. W., Pietschnig, J., Voracek, M., &

    Tovée, M. J. (2012). Further investigation of the validity and reliability of the

    Photographic Figure Rating Scale for body image assessment. *Journal of*

    Personality Assessment, *94*, 404-409. doi: 10.1080/00223891.2012.660293

Swami, V., Stieger, S., Haubner, T., & Voracek, M. (2008). German translation and

    psychometric evaluation of the Body Appreciation Scale. *Body Image*, *5*, 122-

    127. doi: 10.1016/j.bodyim.2007.10.002

Tian, L. M. (2006). Shortcomings and merits of the Chinese version of the Rosenberg

    (1965) Self-Esteem Scale. *Psychological Exploration*, 26, 88-91.

Tiggemann, M. (2015). Considerations of positive body image across various social

    identities and special populations. *Body Image*, *14*, 168-176. doi:

    10.1016/j.bodyim.2015.03.002

Tylka, T. L., & Wood-Barcalow, N. L. (2015a). What is and what is not positive body

    image? Conceptual foundations and construct definition. *Body Image, 14*, 118-

    129. doi: 10.1016/j.bodyim.2015.04.011

Tylka, T. L., & Wood-Barcalow, N. L. (2015b). The Body Appreciation Scale-2: Item

    refinement and psychometric evaluation. *Body Image*, *12*, 53-67. doi:

    10.1016/j.bodyim.2014.09.006

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. doi: 10.1016/j.bodyim.2015.03.010

Table 1. *Model Fit Indices and Tests of Measurement Invariance for the One-Factor Body Appreciation Scale-2 Model Across Participant Sex*

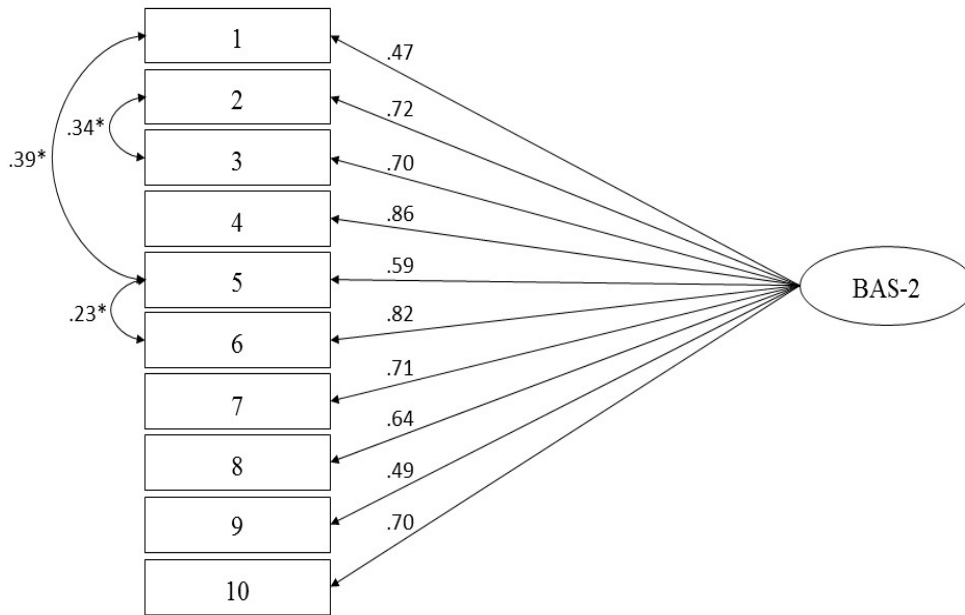|	χ^2_M	df $_M$	χ^2_{normed}	RMSEA (90% *CI*)	SRMR	CFI
Men (*n* = 154)	71.357	32	2.230	.090 (.062, .118)	.051	.949
Women (*n* = 191)	94.187	32	2.943	.101 (.078, .125)	.056	.934
Configural Invariance	165.540	64	2.587	.068 (.055, .081)	.051	.941
Factor Loading Invariance	182.323	73	2.498	.066 (.054, .078)	.060	.936
Intercept Invariance	199.325	83	2.402	.064 (.053, .075)	.061	.932

Figure 1. The one-dimensional model of the Body Appreciation Scale-2 with standardised parameter estimates. *Note*: *Denotes covary of error terms between items.

Appendix

Body Appreciation Scale-2 (BAS-2) Items in English and Standard Chinese

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1. I respect my body / □□□□□□□□□

2. I feel good about my body / □□□□□□□□□□□□

3. I feel that my body has at least some good qualities / □□□□□□□□□□□□□□□□□

4. I take a positive attitude towards my body / □□□□□□□□□□□□□□

5. I am attentive to my body's needs / □□□□□□□□□□□

6. I feel love for my body / □□□□□□□□

7. I appreciate the different and unique characteristics of my body /

□□□□□□□□□□□□□□□□□

8. My behaviour reveals my positive attitude toward my body; for example, I hold my

head high and smile / □□□□□□□□□□□□□□□□□□□□□□□□□

9. I am comfortable in my body / □□□□□□□□□□

10. I feel like I am beautiful even if I am different from media images of attractive

people (e.g., models, actresses/actors) / □□□□□□□□□□□□□□□□□□□□□□□□□□