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# **Body Image**

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# The Body Acceptance by Others Scale: An assessment of its factorial validity in adults from the United Kingdom



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# ABSTRACT

The construct of body acceptance by others (i.e., the degree to which an individual perceives acceptance for their appearance by others) is central to conceptual models of positive body image and adaptive eating styles. It is typically measured using the 10-item Body Acceptance by Others Scale (BAOS; Avalos & Tylka, 2006), but emerging research has suggested that a unidimensional model of BAOS scores may be unstable. Here, we examined the factor structure of BAOS scores in a sample of adults from the United Kingdom (*N* = 1148). Exploratory factor analyses indicated that BAOS scores reduced to two dimensions in women, of which only a primary 6-item factor struble. In men, all 10 items loaded onto a primary factor. However, the results of confirmatory factor analyses indicated that both models of BAOS scores had poor fit. Although both the unidimensional 10-item and 6-item models had adequate internal consistency, our results are suggestive of factor structure instability. We conclude by suggesting ways in which future research could revise the BAOS to improve its factorial stability and validity.

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## 1. Introduction

Scholars have emphasised the need to consider *positive body image* – defined as an "overarching love and respect for the body" (Tylka, 2018, p. 9) – holistically. This includes its various facets (Tylka & Wood-Barcalow, 2015), as well as the way in which internal experiences of the body are reciprocally and interdependently entwined with external relationships and systems (e.g., family, community, mass media; Cook-Cottone, 2015; Tiggemann, 2019). One important external source that contributes to positive body image is *body acceptance by others*, or the degree to which an individual perceives acceptance for their appearance by others (Avalos & Tylka, 2006). Studies have reported significant and positive associations between body acceptance by others and body functionality (Avalos & Tylka, 2006) and body appreciation (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Tylka & Homan, 2015), respectively.

To measure body acceptance by others, Avalos and Tylka (2006) developed the 10-item Body Acceptance by Others Scale (BAOS)

by modifying items from the Perceived Sociocultural Pressures Scale (PSPS; Stice, Nemeroff, & Shaw, 1996). Two items from the PSPS were adapted to be reflective of perceived acceptance of body shape and weight by others (as opposed to perceived pressure to be thin by others) and the degree to which participants receive messages that their body shape and weight are "fine" (as opposed to messages to have a thin body), respectively. In the BAOS, both items are rated for five sources, namely friends, family, dating partners, mass media, and society. Although Avalos and Tylka did not subject BAOS scores to factor analysis, their pilot study (N =66) with college women from the United States indicated that a unidimensional model of BAOS scores had adequate internal consistency (Cronbach's  $\alpha$  = .91) and adequate test-retest reliability over a 3-week period (r = .85). The BAOS has since been used in diverse populations (Meneses, Torres, Miller, & Barbosa, 2019; Oh, Wiseman, Hendrickson, Phillips, & Hayden, 2012; Swami, 2019; Swami, Laughton, Grover, & Furnham, 2019), where high internal consistency coefficients have been used as a basis for assuming that BAOS scores are unidimensional.

However, this is problematic because internal consistency (particularly when measured using Cronbach's  $\alpha$ ) is not a useful index of score dimensionality (e.g., Green, Lissitz, & Mulaik, 1977). Cronbach's  $\alpha$  tells us that items of a test share a high average correlation, but coefficients may be high even when items of the test measure







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unrelated latent variables. This raises concerns about the latent dimensionality of BAOS scores, particularly as the factor structure of its scores has been infrequently examined. Indeed, only one previous study has examined the factor structure of BAOS scores: in a study with United Kingdom adults (N = 501) using confirmatory factor analysis, Swami, Furnham, Horne, and Stieger (2020) reported that a unidimensional model of BAOS scores had very poor fit. However, the aim of that study was not to assess dimensionality of BAOS scores specifically, which leaves open the question about the best-fitting model of BAOS scores.

As such, it is possible that previous studies that have assumed BAOS scores are unidimensional, including the parent study, have introduced an element of artifactuality into the literature. For example, it is possible that BAOS scores reduce to orthogonal dimensions reflective of the five external sources or some combination thereof (i.e., consistent with sociocultural models of body image and disordered eating; Stice et al., 1996; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999), though specific dimensionality of BAOS scores is difficult to determine in the absence of further analyses. To address this, we subjected BAOS data to exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Adopting an EFA-to-CFA analytic strategy allowed us to consider BAOS item behaviour in the present sample, as well the fit of both previously-hypothesised (i.e., a unidimensional model) and data-driven models. Based on the results of Swami et al. (2020), we did not expect a unidimensional model of BAOS scores to present adequate fit to the data, although it was difficult to prescribe a priori the specific number of factors to be expected.

#### 2. Method

#### 2.1. Participants and procedures

Data for the present study were obtained from a larger dataset (Swami, Weis, Barron, & Furnham, 2018) available at: https://figshare.com/s/ff8b34b877a85f5bbc7c, from which we extracted BAOS, gender, age, and body mass index (BMI) data. The total sample consisted of 716 women and 432 men, all of whom were citizens of the United Kingdom. The United Kingdom represents a very similar cultural and national milieu to the United States, where the BAOS was originally developed, and thus provides a useful context in which to re-examine the dimensionality of BAOS scores. Participants ranged in age from 18 to 81 years (M = 34.87, SD = 12.08) and their BMI (calculated from self-reported height and weight) ranged from 13.63 to 48.05 kg/m<sup>2</sup> (M = 25.95, SD = 5.67). Further demographic details and full procedural information are available in the parent study.

# 2.2. Measures

Participants in the parent study completed the 10-item BAOS (Avalos & Tylka, 2006), which measures an individual's perception of acceptance for, and receipt of messages reflecting acceptance of, their body shape and weight from friends, family, dating partners, society, and the media. Participants rated the frequency of these experiences using a 5-point scale, ranging from 1 (*never*) to 5 (*always*).

#### 2.3. Analytic strategy

We split the total sample using a computer-generated random seed, resulting in one split-half for EFA (women n = 366, men n = 213) and a second split-half for CFA (women n = 350, men n = 219). There were no significant differences between the two subsamples in terms of mean age and BMI, as well as the distribution of genders (all ps > .348). Data from the first split-half were

subjected to principal-axis EFA using the *psych* package (Revelle, 2019) in *R*, whereas data from the second split-half were subjected to CFA using the *lavaan* (Rosseel, 2012), *semTools* (Jorgensen, Pornprasertmanit, Schoemann, & Rosseel, 2018), and *MVN* packages (Korkmaz, Goksuluk, & Zararsiz, 2014) with *R* (R Development Core Team, 2014).

For the EFA, analyses were conducted separately for women and men to allow for the possibility of gender-specific dimensionality of BAOS scores, which has not been considered previously. Subsample size requirements based on item-communality and assumptions for EFA were all met (Clark & Watson, 1995; Worthington & Whittaker, 2006). Because of the expectation of orthogonal factors, we used a varimax rotation, with the number of factors to be extracted determined using parallel analysis (Hayton, Allen, & Scarpello, 2004). Item retention was based on Comrey and Lee's (1992) recommendation. For the CFA, we aimed to test the fit of a unidimensional model of BAOS scores and, if divergent, the model(s) that emerged from our EFAs. Assessment of the present data for normality indicated that they were neither univariate (Sharipo-Wilks *p* < .001) nor multivariate normal (Mardia's skewness = 1629.25, p < .001, Mardia's kurtosis = 49.63, p < .001), so parameter estimates were obtained using the robust maximum likelihood method with the Satorra-Bentler correction. To assess goodness-of-fit, we used standard fit indices as summarised in Swami and Barron (2019). Convergent validity was assessed by calculating the average variance extracted (AVE), with values  $\geq$ .50 considered adequate (Malhotra & Dash, 2011). Internal consistency was assessed using hierarchical  $\omega$  and its associated 95 % CI (Kelley & Pornprasertmanit, 2016).

#### 3. Results

#### 3.1. Exploratory factor analysis

#### 3.1.1. Female subsample

Bartlett's test of sphericity,  $\chi^2(45) = 2839.8$ , p < .001, and the KMO measure of sampling adequacy, KMO = .79, indicated that the BAOS had passable common variance for factor analysis. The results of the EFA revealed 2 factors with  $\lambda > 1.0$ , and parallel analysis indicated that both factors from the actual data had  $\lambda$  greater than the criterion  $\lambda$  generated from the random data (i.e.,  $\lambda_1$  5.57 > 1.26,  $\lambda_2$  1.35 > 1.18). As such, we retained two factors, which explained 62.1 % of the common variance. The fit indices for this model were:  $\chi^2(26) = 695.67, p < .001, CFI = .760, TLI = .584, RMSEA = .265 (90)$ %-CI = .249, .283), SRMR = .07, BIC = 542.2. As reported in Table 1, all 10 items had minimally "fair" factor loadings, but Items #7 and 8 cross-loaded and so were discarded from the model. The second factor had only two remaining items, so it was considered unstable and likewise discarded from the model. Therefore, we concluded that BAOS items reduce to a single, 6-item factor in women ( $\omega$  = .88, 95 %-CI = .86, .90).

#### 3.1.2. Male subsample

Bartlett's test of sphericity,  $\chi^2(45) = 1648.8$ , p < .001, and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, KMO = .84, indicated that the BAOS items had adequate common variance for factor analysis. The EFA revealed 2 factors with  $\lambda > 1.0$ , but parallel analysis indicated that only one factor should be extracted: only the first factor from the actual data had  $\lambda$  greater than the criterion  $\lambda$  generated from the random data (i.e.,  $\lambda_1 5.82 > 1.37$ ,  $\lambda_2 1.19 < 1.25$ ). As such, we retained one factor, which explained 54.4 % of the common variance. The fit indices for this model were:  $\chi^2(35) = 541.69$ , p < .001, CFI = .684, TLI = .592, RMSEA = .261 (90 %-CI = .242, .281), SRMR = .11, BIC = 354.04. All 10 items had minimally

Table 1

Factor Loadings for the EFA-deriv	ed Models for Women and	Men in the First Split-half Sample.
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BAOS items	Women		Men
	F1	F2	F1
1. I've felt acceptance from my friends regarding my body shape and/or weight.	.62	.26	.63
2. My friends have sent me the message that my body shape and weight are fine.	.71	.29	.76
3. I've felt acceptance from my family regarding my body shape and/or weight.	.67	.26	.69
4. My family have sent me the message that my body shape and weight are fine.	.72	.30	.74
5. I've felt acceptance from my dating partners regarding my body shape and/or weight.	.70	.18	.64
6. My dating partners have sent me the message that my body shape and weight are fine.	.74	.24	.76
7. I've felt acceptance from my society regarding my body shape and/or weight.	.45	.67	.80
8. My society has sent me the message that my body shape and weight are fine.	.43	.73	.84
9. I've felt acceptance from mass media regarding my body shape and/or weight.	.21	.87	.70
10. Mass media has sent me the message that my body shape and weight are fine.	.25	.84	.73

"fair" factor loadings and internal consistency was adequate as  $\omega$  = .92 (95 %-CI = .90, .94).

### 3.2. Confirmatory factor analysis

#### 3.2.1. 10-item model

In the second split-half sample, we first examined the fit of Avalos and Tylka's (2006) unidimensional model consisting of all 10 items. For this model, fit indices were suggestive of very poor fit to the data:  $SB\chi^2(35) = 1148.400$ ,  $SB\chi^2_{normed} = 32.81$ , robust RMSEA = .288 (90 %-CI = .274, .302), SRMR = .122, robust CFI = .596, robust TLI = .480, BL89 = .681, AIC = 15946.698. Suggested modification indices were consulted to improve model fit, but despite successively freeing error covariances between

Items #9 and 10 (MI = 366.33,  $\chi^2(1) = 437.75$ , *p* < .001), Items #5 and 6 (MI = 283.34,  $\chi^2(1) = 312.33$ , *p* < .001), and Items #3 and 4 (MI = 132.84,  $\chi^2(1) = 144.22$ , *p* < .001) in accordance with the results from likelihood ratio tests, fit indices remained below acceptable levels: SB $\chi^2(32) = 464.398$ , SB $\chi^2_{normed} = 14.51$ , robust RMSEA = .203 (90 %-CI = .187, .220), SRMR = .092, robust CFI = .816, robust TLI = .741, BL89 = .876, AIC = 15058.404. In the second split-half subsample, internal consistency was adequate,  $\omega$  = .90 (95 %-CI = .88, .91), but convergent validity was less-than-adequate, as AVE = .45.

#### 3.2.2. 6-item model

Fit indices for the EFA-derived 6-item model were indicative of a poor model fit:  $SB\chi^2(9) = 338.686$ ,  $SB\chi^2_{normed} = 38.63$ , robust RMSEA = .353 (90 %-CI = .321, .385), SRMR = .096, robust CFI = .683, robust TLI = .472, BL89 = .800, AIC = 9697.679. Modification indices were consulted to improve model fit, but despite successively freeing error covariances between Items #5 and 6 (MI = 322.944,  $\chi^2(1) = 300.97$ , p < .001), Items #1 and 4 (MI = 108.97,  $\chi^2(1) = 159.14$ , p < .001), and Items #4 and 5 (MI = 322.43,  $\chi^2(1) = 144.22$ , p < .001) in accordance with the results from likelihood ratio tests, fit indices remained below adequate levels:  $SB\chi^2(6) = 85.82$ ,  $SB\chi^2_{normed} = 14.30$ , robust RMSEA = .204 (90 %-CI = .167-.243), SRMR = .056, robust CFI = .929, robust TLI = .823, BL89 = .952, AIC = 9202.629. In the second split-half sample internal consistency was adequate,  $\omega = .87$  (95 %-CI = 84, .89) and there was acceptable evidence of convergent validity, as AVE = .52<sup>1</sup>.

#### 4. Discussion

With one exception, previous studies have not examined the factorial validity of BAOS scores. Like Swami et al. (2020), our work showed that the hypothesised unidimensional, 10-item model of BAOS scores had poor fit to the data. Extending previous work, we also found that a data-derived model – namely the 6-item, EFA-based model with women in the present study – also had poor CFA-based fit. In short, the results of the present study suggest that there are difficulties with the factor structure of the BAOS, at least in adults from the United Kingdom. Two further issues are worth highlighting: first, both models tested here demonstrated poor fit despite having adequate internal consistency coefficients and, second, both models showed poor fit even after error covariances were freed between three pairs of items in an attempt to improve fit.

Our results raise concerns that previous findings based on a unidimensional model of BAOS scores may be artefactual. That is, the decision to treat BAOS scores as unidimensional may provide an inappropriately simplified index of the construct of body acceptance by others. More specifically, factor structure instability of the BAOS could be caused by a number of interconnected issues. One possibility is that the items of the BAOS do not adequately tap the construct of body acceptance by others (i.e., an issue of BAOS content validity). This could be addressed through a careful consideration of the construct of body acceptance by others itself and through future refinement or revision of the items of the BAOS. In terms of the former, it may be worth considering whether body acceptance by others should necessarily be construed as both the subjective feeling of acceptance by others and receiving supportive messages from others. For example, it is possible that body acceptance by others is not contingent on receiving messages of acceptance from others.

In terms of specific item content, it may be useful to consider whether factorial validity could be improved through a clearer distinction between sources that vary in the degree of connection (e.g., close friends versus friends in general), importance (e.g., parents/caregivers versus other family members), and form (e.g., social media versus other forms of mass media). It may also be useful for BAOS items to distinguish between communities that individuals actively derive a sense of social identity from and more distal communities, with the former being expected to be more important

<sup>&</sup>lt;sup>1</sup> Because both models demonstrated poor fit, we did not believe there was much value in conducting further analyses. Nevertheless, for the sake of a full reporting, we conducted multi-group CFA to assess measurement invariance at the configural, metric, and scalar levels for gender (for details, see Chen, 2007; Cheung & Rensvold, 2002). Because the 6-item model derived from the EFA with women evidenced comparatively better fit based upon AIC and also evidenced acceptable convergent validity and internal consistency reliability, we used this model in further analyses (see Supplementary Fig. 1). Using multi-group CFA with the 6-item model, metric invariance was supported across gender based upon the  $\Delta$ CFI < .01 criterion

<sup>(</sup>Cheung & Rensvold, 2002) and scalar invariance was supported based upon the  $\Delta$ SRMR criterion (Chen, 2007) (see Supplementary Table 1). Using the total sample, an independent-samples *t*-test indicated that women (M = 3.51, SD = 0.94) had significantly higher BAOS scores than men (M = 3.35, SD = 0.94), t(1146) = 2.81, p = .005, d = 0.17. Although the effect size of this difference was small, the direction of the difference is notable given that women's appearance and bodies are more often the targets and topics of critiques from others compared to men. This is something that may be worth investigating further once the issue of factorial validity of BAOS scores is settled.

in terms of body acceptance. Such revisions are likely to result in an orthogonally multidimensional instrument (Stice et al., 1996; Thompson et al., 1999), which is hinted at in the results of our EFA with women. Alternatively, if it is desirable to maintain a unidimensional view of body acceptance by others, then it may be necessary to construct generalist item content that does not refer to sources.

It is possible that the factor structure instability we report here is limited to samples from the United Kingdom and, as such, it may be useful to examine the factorial validity of BAOS scores in other national and social identity groups. In the meantime, we suggest that findings of previous studies that have operationalised BAOS scores as unidimensional should be considered with some caution, as those studies may have unintentionally introduced an element of artifactuality into their findings. More generally, and given the centrality of body acceptance by others to both positive body image and adaptive eating styles (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006), there is a need to carefully revise the BAOS for future use.

#### **CRediT authorship contribution statement**

Viren Swami: Conceptualization, Methodology, Data curation, Writing - original draft, Project administration. Jennifer Todd: Conceptualization, Methodology, Formal analysis, Writing - review & editing. Stefan Stieger: Conceptualization, Methodology, Writing review & editing. Tracy L. Tylka: Conceptualization, Methodology, Writing - review & editing.

# Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.bodyim.2020. 08.006.

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