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Brief research report

Measuring internalized weight attitudes across body weight categories: Validation of the Modified Weight Bias Internalization Scale

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ABSTRACT

The purpose of this research was to validate a modified version of the Weight Bias Internalization Scale (WBIS-M) that is applicable to individuals across different body weight statuses. One hundred forty-eight men and women completed an online survey that included the WBIS-M and relevant measures of psychopathology. Results indicated that the WBIS-M had high internal consistency and strong construct validity. The WBIS-M also demonstrated significant correlations with body image, eating pathology, self-esteem, and symptoms of anxiety and depression, and was associated with these outcomes distinctly from antifat attitudes and body mass index. Implications for the use of this scale in diverse samples are discussed.

Introduction

As obesity has gained more attention as a global health concern, researchers, clinicians, and public health officials have also begun considering the consequences of weight-based bias, discrimination, and stigmatization. Weight bias refers to negative attitudes toward individuals because of overweight or obesity, and individuals with obesity commonly experience weight stigmatization in education, employment, and health-care settings, among other life domains (Puhl & Heuer, 2009). Empirical evidence consistently supports links between experiences of weight-based stigmatization and negative physical and mental health outcomes, including depression, anxiety, disordered eating, and poorer overall health-related quality of life (Gearhardt, Bragg, Pearl, Schvey, Roberto, & Brownell, 2012; Puhl & Heuer, 2009). Experiencing weight stigma has also been linked to body image disturbances such as increased body dissatisfaction, body image distress, and preoccupation with weight (Annis, Cash, & Hrabosky, 2004; Myers & Rosen, 1999).

In addition to exposure to weight stigma, internalization of weight-biased attitudes, or self-directed stigma, may play a role in facilitating these negative health outcomes among individuals with obesity. Durso and Latner (2008) developed the Weight Bias Internalization Scale (WBIS) to measure the degree to which people apply weight-based stereotypes to themselves and base their self-evaluations on weight. Weight bias internalization, as measured by the WBIS, has consistently correlated with clinically-significant body image disturbance, shape and weight concerns, eating pathology, and other forms of psychopathology among overweight and obese adolescents and adults (Carels, Wott, Young, Gumble, Koball, & Oehlhof, 2010; Durso & Latner, 2008; Durso et al., 2012; Puhl, Moss-Racusin, & Schwartz, 2007; Roberto et al., 2012). Recent studies have also linked weight bias internalization to poorer global health functioning among individuals with overweight and obesity when controlling for body mass index (BMI; Latner, Durso, & Mond, 2013; Pearl, White, & Grilo, in press), highlighting the significant role that this construct may play in determining health over and above the effects of body weight.

In a recent review of existing measures to assess weight stigmatization, DePierre and Puhl (2012) issued a call for more self-report measures that allow for assessment of weight stigmatization across different body weight categories. While the WBIS serves as a useful measure of internalized stigma for individuals who consider themselves to be overweight, the current wording of its items limits its generalizeability to other populations. It is possible that internalized weight stigma affects individuals across weight statuses—such as individuals who were formerly obese, those with distorted body image, or who struggle with eating disorders—but no research to date has applied this construct to these other populations whose

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health may be similarly affected and thus could benefit from interventions aimed at reducing weight bias. Additionally, there is a need for a measure of weight bias internalization that can be completed by all participants in research studies to allow for comparisons between populations with obesity to non-overweight control groups. Finally, Durso and Latner (2008) cited the lack of men in their sample as a limitation to generalizing the use of this scale. Given the strong links between weight bias internalization, eating and body image disturbances, and psychopathology (Carels et al., 2010; Durso & Latner, 2008; Durso et al., 2012; Roberto et al., 2012), it is important to develop a measure of weight bias internalization that can be applied broadly to diverse populations in order to assess the full impact of this problem. Therefore, the purpose of this study was to validate a modified version of the WBIS that measures internalized weight attitudes among men and women across body weight statuses. It was hypothesized that the modified WBIS would demonstrate similar psychometric properties and correlates as the original scale in this sample of individuals of varying weight statuses and that, while gender differences could emerge, the scale would generalize to men as well as women.

Method

Participants

Data were collected from 150 participants living in the U.S., comparable to the sample size in the original WBIS validation study (Durso & Latner, 2008). Two participants were excluded due to missing self-reported height and weight data, resulting in a total of 148 participants (50% men; 79.1% White, Non-Hispanic; ages 19–70, $M = 35.57$, $SD = 11.95$). Participants were recruited via Amazon.com's Mechanical Turk (MTurk) online data collection service and compensated $1.25. MTurk has been established as a reliable and psychometrically sound data source of diverse and representative participants (Buhrmester, Kwang, & Gosling, 2011), and has demonstrated acceptability for collecting data regarding body-related perceptions and attitudes (Gardner, Brown, & Boice, 2012). Based on self-reported weight and height, participants' BMIs ranged from 16.44 to 72.06 kg/m^2 ($M = 27.97$, $SD = 7.27$). According to the National Institutes of Health's weight classification guidelines, 3.4% of participants were underweight (BMI < 18.5), 35.8% normal weight (18.5 ≤ BMI < 25), 29.7% overweight (25 ≤ BMI < 30), and 31.1% obese (BMI ≥ 30). Based on participants' perceptions of their weight status, 6% were underweight, 40.5% normal weight, 39.2% overweight, 14.2% obese.

Measures and Procedures

All participants provided consent before completing the modified WBIS (WBIS-M), along with each of the measures included in the original WBIS validation study (Durso & Latner, 2008): the Dislike subscale of the Antifat Attitudes Questionnaire (AAQ; Crandall, 1994; Cronbach's $\alpha = .91$); the 21-item Depression Anxiety Stress Scales (DASS-21; Antony, Bieling, Cox, Enns, & Swinson, 1998; $\alpha = .94$), the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1979, $\alpha = .93$); the short version of the Body Shape Questionnaire (BSQ; Dowson & Henderson., 2001; $\alpha = .97$); The Drive for Thinness subscale of the Eating Disorder Inventory (DFT; Garner, Olmstead, & Polivy, 1983; $\alpha = .89$); and the Eating Disorder Diagnostic Scale (EDDS), from which, consistent with the initial WBIS validation study (Durso & Latner, 2008), we focused on two items addressing frequency of binge eating in the past three and six months (Stice, Telch, & Rizvi, 2000). All measures were presented in a randomized order.

The WBIS-M was based on the 11 items that were included in the final scale by Durso and Latner (2008). To make the scale more accessible to individuals of diverse weight categories, phrases including the word "overweight" were replaced with phrases that instead used the word "my weight." For example, the beginning of Item 1 was changed from "*As an overweight person. . .*" to "*Because of my weight. . .*" A total of six items were changed, and the remaining five items were retained in their original form (the full scale is available online as an Appendix in Supplementary Materials). As with the original scale, responses were rated on a 7-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree."

At the end of the study, participants reported demographic information, including height and weight, and weight status. The study was approved by the university's institutional review board.

Results

Correlations

Table 1 presents the means and standard deviations for all outcome measures. The mean score of the WBIS-M was 3.27 ($SD = 1.50$) with a Cronbach's alpha of 0.94, Eigenvalue of 7.19, and all factor loadings at or above 0.50. These statistics are comparable to those reported for the original WBIS ($M = 3.95$, $SD = 1.28$, $\alpha = .90$, Eigenvalue = 5.42; Durso & Latner, 2008). The correlation results for the WBIS-M alongside the correlations reported by Durso and Latner (2008) for the WBIS are displayed in Table 1. Unlike in the original WBIS validation paper, there was a significant positive correlation between the WBIS-M and BMI in this sample. Full and partial

Table 1
Means, correlations, and partial correlations of WBIS and WBIS-M with study measures.

Measure	Mean (*SD*)	WBIS Correlation[a]	WBIS-M Correlation	WBIS Partial Correlation[a,b]	WBIS-M Partial Correlation[b]
AAQ-Dislike	3.21 (2.14)	.31**	.17*	.32**	.22**
BSQ	2.98 (1.42)	.74**	.77**	.75**	.72**
DFT	4.62 (5.48)	.47**	.56**	.48**	.50**
RSE	1.99 (0.71)	−.68**	−.56**	−.67**	−.50**
DASS-21	1.73 (0.62)	.51**	.44**	.50**	.43**
EDDS					
3Mos	2.98 (3.04)	.25**	.36**	.24**	.29**
6Mos	2.43 (1.71)	.32**	.47**	.31**	.40**
BMI	27.97 (7.27)	.15	.47**		

[a] Statistics reported in Durso and Latner (2008).
[b] Controlling for BMI.
* $p < .05$, two-tailed.
** $p < .01$, two-tailed.
WBIS = Weight Bias Internalization Scale; WBIS-M = Modified Weight Bias Internalization Scale.
AAQ-Dislike = Dislike Subscale of Antifat Attitudes Questionnaire; BSQ = Body Shape Questionnaire; DFT = Drive for Thinness subscale of Eating Disorders Inventory; RSE = Rosenberg Self-Esteem Scale; DASS-21 = 21-item Depression Anxiety Stress Scales; EDDS 3Mos and 6Mos = Binge eating behavior in past 3 and 6 months as measured by the Eating Disorder Diagnostic Scale.

Table 2
Summary of multiple linear regression analyses for Modified Weight Bias Internalization Scale (WBIS-M).

Dependent Variables (Standardized Beta Values)						
Independent Variables	Body Shape Questionnaire	Drive for Thinness	Depression Anxiety Stress Scales	Rosenberg Self-Esteem Scale	Binge Frequency 3 Months	Binge Frequency 6 Months
Step 1						
BMI	0.43**	0.30**	0.13	−0.29**	0.25**	0.28**
AAQ	0.22**	0.24**	0.22**	−0.27**	0.19*	0.24**
Gender	0.27**	0.30**	0.17*	−0.18**	−0.04	−0.01
Step 2						
BMI	0.08	0.08	−0.09	−0.04	0.08	0.05
AAQ	0.04	0.12	0.10	−0.14	0.11	0.12
Gender	0.05	0.15*	0.03	−0.01	−0.15	−0.16*
WBIS-M	0.72**	0.45**	0.45**	−0.51**	0.35**	0.47**
Step 3						
BMI	0.08	0.08	−0.09	−0.04	0.08	0.05
AAQ	0.03	0.11	0.10	−0.14	0.11	0.13
Gender	0.05	0.16*	0.03	−0.01	−0.16	−0.16*
WBIS-M	0.65**	0.24	0.43**	−0.57**	0.45**	0.52**
WBIS-M × Gender	0.08	0.28*	0.03	0.07	−0.13	−0.07

* $p < .05$, two-tailed.
** $p < .01$, two-tailed.
All continuous independent variables were standardized.
The variable of Gender was dummy-coded (male = 0, female = 1).

correlations (controlling for BMI) for all other measures were highly comparable to those reported in the initial validation study.

Given that this sample included overweight and non-overweight participants, we also considered whether categorical weight status would affect the pattern of results. Correlations between the WBIS-M and categorical weight status, and partial correlations controlling for categorical weight status were analyzed, based both on BMI and self-perceived weight status. Analysis of variance (ANOVA) revealed significant differences in WBIS-M scores among weight status categories: BMI $F(3, 144) = 10.39$, $p < .001$, $\eta^2 = .18$, Underweight $M = 2.67$, $SD = 1.27$, Normal Weight $M = 2.58$, $SD = 1.29$, Overweight $M = 3.30$, $SD = 1.28$, Obese $M = 4.11$, $SD = 1.57$; Self-perceived weight status $F(3, 144) = 33.47$, $p < .001$, $\eta^2 = .41$, Underweight $M = 2.93$, $SD = 1.39$, Normal Weight $M = 2.34$, $SD = 1.08$, Overweight $M = 3.60$, $SD = 1.19$, Obese $M = 5.19$, $SD = 1.26$. Pairwise comparisons demonstrated that participants in the obese range scored significantly higher on the WBIS-M than participants in all other weight categories regardless of the manner of classification; BMI 95% CIs [0.15, 2.72], [0.98, 2.07], and [0.23, 1.38], $ps < .03$; Self-perceived weight status 95% CIs [1.35, 3.18], [2.27, 3.44], and [1.01, 2.19], $ps < .001$. Additionally, overweight participants scored higher than normal weight participants; BMI 95% CI [0.17, 1.28], $p = .011$; Self-perceived weight status 95% CI [0.83, 1.68], $p < .001$. However, the WBIS-M remained a significant predictor of all outcome variables when controlling for weight status (based on BMI or self-perceived weight status; $ps < .01$).[1] Since no differences emerged depending how body weight status was classified, the standard classification method of BMI was used for the remaining analyses.

ANOVA revealed that WBIS-M scores were significantly higher among female versus male participants, $F(1, 146) = 10.74$, $p = .001$, $\eta^2 = .07$, Female $M = 3.67$, $SD = 1.64$, Male $M = 2.88$, $SD = 1.25$. We therefore tested for moderation by gender in the subsequent regression analyses.

Regression

To evaluate the relative value of the WBIS-M in predicting psychopathology and self-esteem in comparison to BMI and antifat attitudes, and to determine whether gender moderated the effects, multiple linear regressions were conducted including BMI, AAQ scores, and gender in the first step, WBIS-M scores in the second step, and the interaction between WBIS-M scores and gender in the third step. Regression results are summarized in Table 2. As reported in the initial WBIS validation analyses, all regression models explained a significant proportion of variance for predicting body esteem, self-esteem, depression and anxiety symptoms, and binge eating behavior. The WBIS-M significantly predicted outcomes above and beyond BMI and AAQ scores, and the effects of these variables became largely insignificant once WBIS-M was included. Gender did not significantly moderate the results for any outcome except DFT scores ($p = .017$), and simple slopes analysis revealed that DFT scores were significantly associated with WBIS-M scores among women ($\beta = 0.59$, $p < .001$) but not men ($\beta = 0.24$, $p = .06$).

Discussion

The findings from this study demonstrate the sound psychometric properties of the modified WBIS. Both the internal consistency of the scale and its predictive value for relevant psychological outcomes such as body dissatisfaction, drive for thinness, and binge eating match or exceed the strength of the original scale. This study also validated the scale in a sample that included both men and women. Women scored significantly higher on the WBIS-M than men, which is consistent with research indicating that women are more vulnerable to weight-based stigmatization due to greater focus on and stricter ideals for body weight in Western society (e.g., Puhl, Andreyeva, & Brownell, 2008); however, with the exception of drive for thinness, WBIS-M scores predicted all outcomes regardless of gender, suggesting the generalizeability of this scale to men and women.

Scores on the WBIS-M were higher among participants with higher BMIs and self-perceived weight statuses, which is reasonable considering that individuals with overweight and obesity are more likely to experience weight-based discrimination (Carr and Friedman, 2005). Although previous research has reported no differences in WBIS scores based on BMI (e.g., Durso & Latner, 2008; Durso et al., 2012), these studies only included participants with BMIs in the overweight or obese range, so it is likely that the differences observed in this study resulted from the broader range of

[1] Detailed statistical output is available upon request.

participant BMI. The predictive value of WBIS-M scores above AAQ scores further support discriminant validity of self-directed stigma versus stigmatizing attitudes toward others, and the finding that WBIS-M scores predicted psychological outcomes above the effect of BMI confirms the utility of this scale in assessing self-directed weight stigma across body weight categories.

Limitations of this study include the use of an online sample and lack of racial diversity. Nevertheless, this modified scale allows for future research to explore the role that weight bias internalization may play in contributing to negative health outcomes across body weight statuses, particularly for individuals with disturbed body image or eating behaviors. This scale can also prove useful in empirical investigations of individuals who were obese and experienced stigma earlier in life, as well as in studies comparing participants with obesity to control groups by allowing researchers to administer the same measures to all participants, thus standardizing their research protocols. In addition to its value for research purposes, this modified measure could have utility in clinical settings with patients with eating disorders and body image disturbances to assess the that role weight bias internalization may play in their eating pathology, regardless of their body weight.

Conclusions

In summary, although considerable research has documented pervasive weight stigmatization in American culture (Puhl & Heuer, 2009), little work has examined the extent to which targets of weight stigma may internalize negative societal stereotypes and bias, and how this affects their well-being. In light of the continued social acceptability of weight bias, many individuals are vulnerable to self-directed stigma and blame. Results from the present study suggest that internalized weight bias is related to psychopathology among men and women across weight categories, indicating that the WBIS-M provides a useful research and clinical assessment tool in efforts to better understand the extent and nature of this phenomenon in diverse populations.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.bodyim.2013.09.005.

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