


# Does terminology matter when measuring stigmatizing attitudes about weight? Validation of a brief, modified attitudes toward obese persons scale

Caitlin A. Martin-Wagar<sup>1</sup>  | Katelyn A. Melcher<sup>1</sup> | Sarah E. Attaway<sup>1</sup> |  
Brooke L. Bennett<sup>2</sup> | Connor J. Thompson<sup>1</sup> | Oscar Kronenberger<sup>1</sup> | Taylor E. Penwell<sup>1</sup>

<sup>1</sup>Department of Psychology, University of Montana, Missoula, Montana, USA

<sup>2</sup>Department of Psychology, Clemson University, Clemson, South Carolina, USA

## Correspondence

Caitlin A. Martin-Wagar.  
Email: [Caitlin.Martin-Wagar@umontana.edu](mailto:Caitlin.Martin-Wagar@umontana.edu)

## Funding information

National Institute of General Medical Sciences,  
Grant/Award Number: P20GM130418;  
National Institutes of Health

## Abstract

**Objective:** Commonly used terms like “obese person” have been identified as stigmatizing by those with lived experience. Thus, this study sought to revise a commonly used measure of weight stigmatizing attitudes, the Attitudes Toward Obese Persons (ATOP) scale.

**Methods:** The original terminology in the 20-item ATOP (e.g., “obese”) was compared to a modified version using neutral terms (e.g., “higher weight”). Participants ( $N = 832$ ) were randomized to either receive the original or modified ATOP.

**Results:** There was a statistically significant difference, with a small effect size ( $d = -0.22$ ), between the scores of participants who received the original ATOP ( $M = 69.25$ ) and the modified ATOP ( $M = 72.85$ ),  $t(414) = -2.27$ ,  $p = 0.024$ . Through principal component analysis, the modified ATOP was best used as a brief, 8-item unidimensional measure. In a second sample, confirmatory factor analysis verified the fit of the brief, 8-item factor structure.

**Conclusions:** Findings suggest that a modified, brief version of the ATOP (ATOP-Heigher Weight; ATOP-HW) with neutral language is suitable for assessing negative attitudes about higher-weight people. The ATOP-HW may slightly underestimate weight stigma compared to the original ATOP, or the language in the ATOP may magnify negative attitudes. Further examination of the terminology used in weight stigma measures is needed to determine how to best assess weight stigma without reinforcing stigmatizing attitudes. The present study's findings suggest that the use of neutral terms in measures of anti-fat bias is a promising solution that warrants further investigation.

## KEYWORDS

anti-fat bias, weight bias, weight stigma, weight-related prejudice

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2024 The Author(s). Obesity Science & Practice published by World Obesity and The Obesity Society and John Wiley & Sons Ltd.

## 1 | INTRODUCTION

Weight stigma refers to negative attitudes, beliefs, stereotypes, and actions based on a person's weight, and is pervasive across education, healthcare, media, and the workplace.<sup>1,2</sup> Some weight-normative public health campaigns invoke weight stigma and shame in hopes of motivating people to lose weight.<sup>3</sup> However, rather than promoting health, weight stigma is associated with numerous adverse mental health outcomes, such as disordered eating, depression, anxiety, stress, body dissatisfaction, poor self-esteem, satisfaction with life, and substance use.<sup>4-10</sup> Similarly, experienced weight stigma has negative physical health correlates, such as increased cortisol reactivity, avoidance of healthcare, reduced engagement in physical exercise, and arterial pressure.<sup>11-15</sup> Finally, weight stigma is associated with adverse social and academic outcomes, such as rejection by peers and lower classroom engagement.<sup>9</sup>

Given the toll of weight stigma, it is important to determine the best ways to measure and address weight stigma. The implications of terminology choice when discussing weight are clear. For people trying to lose weight, the terms "fat," "obese," and "extremely obese" used by healthcare providers have been rated as the most undesirable.<sup>16</sup> Furthermore, individuals preferred that providers merely referenced individuals' weight rather than using terms viewed by individuals with higher weight as stigmatizing.<sup>16</sup> A systematic review of 33 studies elaborates further; researchers found a preference for neutral terminology (e.g., "weight") over terms like "fat" and "obese" across most of these studies.<sup>9</sup> Children have reported feeling upset that their parents described them as "large," "fat," "obese," and "overweight,"; the participants preferred for their parents to use the terms "healthy weight" or "normal weight".<sup>17</sup> Despite being consistently described by individuals with lived experience as stigmatizing, most current measures of weight stigma still use the medical language (e.g., "obese" and "overweight"). Most of these measures were developed before the stigma of these terms was well understood, suggesting that the language used may be outdated.

Recently, the American Psychological Association recommended using inclusive language when discussing body size and weight,<sup>18</sup> which reiterated the points outlined by scholars that suggest using neutral terms such as "weight" or "higher weight" and suggest psychologists not use person-first language as there is no consensus on whether this is preferred.<sup>19,20</sup> Similarly, the National Institute of Health recommends using "person with higher weight, higher-weight individual, person with a larger body, or other similar neutral descriptors, rather than person with obesity or overweight".<sup>21</sup> Clearly, there is a growing movement to modify the terminology used to describe people with higher weight. Perhaps, more terminology changes will support a less stigmatizing environment for those with higher weight.

Besides conveying stigma, the term "obese" lacks a solid meaning and application of the definition of "obesity." In a position statement from the World Obesity Federation, experts provide further reason to omit the word in most settings, highlighting the varied obesity definitions proposed by public health organizations.<sup>22</sup> For example, the World Health Organization (WHO) defines obesity as "abnormal

or excessive fat accumulation that presents a risk to health".<sup>23</sup> Conversely, the Centers for Disease Control and Prevention (CDC) defines obesity as a body mass index (BMI) greater than 30.0.<sup>24</sup> However, a 2022 position statement from the WHO challenges the meaning and application of the CDC's definition, stating that BMI-based approaches to obesity fail to acknowledge the location and function of adipose tissue, as it relates to adiposity-based chronic disease.<sup>23</sup> Additionally, scholars note that applications of obesity that rely on BMI or other anthropometric metrics only fail to capture obesity as a chronic disease.<sup>22</sup> A previous study supports this position, pointing out that weight and health are not always synonymous and that so-called adiposity-related health impairments can occur in those within the "healthy weight" range (when using BMI as a descriptor of one's weight-related health).<sup>25</sup>

Given that the term "obesity" is viewed as stigmatizing, and the meaning lacks clear consensus, testing modified versions of these measures is warranted. When searching for measures examining weight stigma toward others that use more neutral language descriptors (e.g., higher weight, larger-bodied), none were found. For internalized weight bias, the research team noted that the Weight Bias Internalization Scale<sup>26</sup> had a modified version that changed the term "overweight" to "my weight," and maintained good reliability and validity.<sup>27</sup> Thus, the present study sought to adapt the Attitudes Toward Obese Persons (ATOP)<sup>28</sup> scale, a frequently used measure of weight stigma toward others. Though often used in current research, contemporary recommendations from major medical associations and peer-reviewed journals suggest discontinuing the use of condition first language (e.g., "obese persons") in favor of people-first language (e.g., "persons with obesity"<sup>29</sup>). The original ATOP scale was compared to a modified version of the instrument, using neutral terms such as "higher weight." It was hypothesized that there would be no difference in endorsed negative attitudes toward those with higher weight between those who completed the original ATOP compared to those who completed the modified version. Finally, given that the original ATOP factor structure has been inconsistently replicated<sup>30,31</sup> since its validation study,<sup>28</sup> the factor structure of both ATOP samples (ATOP original and ATOP modified) was examined. For example, researchers have found different two-factor models (suffer and inferior in a college sample; self-esteem and personality/social difficulties in a bariatric surgery sample)<sup>30,31</sup> In both of these studies, not all 20 ATOP items loaded onto a factor. Given the stigmatizing effects of terms like "obese," this study was conducted in hopes of gathering a better understanding of how weight-related terminology used in a research measure might relate to different attitudes toward individuals of higher weight.

## 2 | METHODS

### 2.1 | Participants and procedures

Recruitment of participants as through a university subject pool at a midsized university in the northwestern region of the United States

from November 2022 to December 2023. To be eligible to participate, participants needed to be at least 18 years of age or older. Participants completed a consent form at the beginning of the online Qualtrics survey and were able to receive course or extra credit for their participation. Students were given the option of alternative assignments if they didn't want to participate in the research. For sample size for confirmatory factor analysis, the study aimed to obtain 10 participants per each of the 20 items. Thus, there were approximately 400 participants for each randomized group so data could be split into two randomized halves (approximately 200 participants in each condition) for the confirmatory factor analyses (CFAs). Participants were then randomly assigned to complete either the original version of the Attitudes Toward Obese Persons Scale (ATOP)<sup>28</sup> or a modified version of the ATOP. After randomization, all participants completed additional questionnaires related to weight bias and eating disorder symptomatology.

## 2.2 | Measures

**Demographics information.** Participants reported age, gender identity, race, ethnicity, and self-reported anthropometric information (height and weight). Calculation of BMI occurred from the self-reported height and weight. Total sample BMI ranged from 16.30 to 72.52 ( $M = 24.99$ ,  $SD = 5.67$ ), with 4.1% in the underweight BMI category, 57.5% in the healthy weight BMI category, 23.7% in the overweight BMI category and 14.7% in the obesity BMI category. There were no significant differences between the ATOP group BMIs ( $M = 24.92$ ,  $SD = 5.53$ ) and ATOP-HW group BMIs ( $M = 25.06$ ,  $SD = 5.79$ ;  $t(828) = -0.36$ ,  $p = 0.720$ ,  $CI [-0.91, 0.63]$ ). Total sample age ranged from 18 to 52 years ( $M = 21.01$ ,  $SD = 5.40$ ). There were no significant differences between the ATOP group ages ( $M = 21.17$ ,  $SD = 5.69$ ) and ATOP-HW group ages ( $M = 20.85$ ,  $SD = 5.09$ ;  $t(827) = 0.86$ ,  $p = 0.389$ ,  $CI [-0.41, 1.06]$ ). Additional participant demographics for the randomized groups can be found in Table 1.

**Attitudes Toward Obese Persons Scale (ATOP).**<sup>28</sup> Negative stereotypical attitudes about people with obesity were measured using the ATOP. The ATOP is a 20-item measure using a Likert rating scale ranging from "I strongly disagree" (-3) to "I strongly agree" (3). A total score is calculated by reverse scoring the 13 negative items, summing the items, and then adding 60. Scores range from 0 to 120, where higher scores indicate more positive attitudes toward people with obesity. There are also three subscales: Different Personality (negative attributes about one's personality and abilities), Social Difficulties (experiencing social and interpersonal problems), and Self-Esteem. The ATOP has shown adequate internal reliability in adult populations.<sup>28</sup> In the current study, the ATOP had a McDonald's Omega of 0.84 and Cronbach's alpha of 0.84, demonstrating good internal consistency.

**Attitudes Toward Persons with Higher Weight Scale (ATOP-HW).** In the modified version of the ATOP, the term "obese" was replaced with "higher weight" or "larger body" and "nonobese" was replaced with "thin." The ATOP-HW had a McDonald's Omega of

0.82 and Cronbach's alpha of 0.82, demonstrating good internal consistency. See Table 2 for a comparison of wording between the two versions of the ATOP.

## 2.3 | Analytic plan

Analyses occurred in IBM® SPSS® Statistics 29 and R. The team examined descriptive statistics of participant demographics and internal consistency of the measures, and randomly split the sample in half so that the factor structure determined in a principal component analysis (PCA) for the new ATOP-HW for the first half of the data could be confirmed in a CFA with the second half of the data. First, the analyses compared the two ATOP randomized groups on their total ATOP scores using an independent-sample *t*-test. Next, R<sup>32</sup> with package lavaan<sup>33</sup> performed two CFA. Model fit indices cutoffs were the comparable fit index (CFI; at least 0.95), the standardized root-mean square error of approximation (RMSEA; 0.06 or below), and the standardized root-mean square residual (SRMR; 0.08 or below).<sup>34,35</sup> Following the findings of the CFAs, the team conducted PCA for the ATOP-HW to determine a suitable factor structure, and for the original ATOP to compare factor structures. Finally, R performed another CFA, this time on the second half of the ATOP-HW data, to verify the factor structure indicated in the PCA. Reliability statistics are also presented for the modified measures. The university Institutional Review Board approved the study procedures (#185-21).

## 3 | RESULTS

Eight hundred and eighty-four students consented to participate in the study. Of these, removals occurred for three participants under 18, and 22 due to missing the survey data needed for the study. The survey included attention checks throughout the survey (e.g., "select always"). Of the remaining participants, removals occurred for 27 participants who failed at least two of the three attention checks. A total of 832 participants remained for analyses.

In assessing the missing data, for the original ATOP, three participants missed one to three items, and the case means replaced the missing items.<sup>36</sup> No data required transformation or removal after assessing normality.

To assess whether the use of non-stigmatizing language affected ATOP scores, the researchers calculated aggregate scores for participants who received the original ATOP ( $N = 202$ ,  $M = 69.25$ ,  $SD = 16.49$ ) and those who received the modified version ( $N = 214$ ,  $M = 72.85$ ,  $SD = 15.84$ ) using an independent-sample *t*-test. Contrary to the primary hypothesis, there was a statistically significant difference between the scores of participants who received the original version (ATOP) and those who received the modified version (ATOP-HW),  $t(414) = -2.27$ ,  $p = 0.024$  (two-tailed), 95%  $CI [-6.71, -0.48]$ . The effect size was small as calculated by Cohen's  $d = -0.22$ , and very small as calculated by eta squared = 0.006.

TABLE 1 Demographic characteristics.

Characteristic	Total sample N = 832		ATOP sample n = 419		ATOP-HW sample n = 413	
	n	%	n	%	n	%
<b>Gender identity</b>						
Cisgender woman	608	73.1	310	74.0	298	72.2
Cisgender man	191	23.0	90	21.5	101	24.5
Nonbinary	19	2.3	12	2.9	7	1.7
Genderfluid	7	0.8	5	1.2	2	0.5
Transgender man	4	0.5	3	0.7	1	0.2
Transgender woman	3	0.4	3	0.7	0	0.0
Demi-girl	2	0.2	1	0.2	1	0.2
Agender	1	0.1	1	0.2	0	0.0
Questioning	1	0.1	1	0.2	0	0.0
Prefer not to say	3	0.4	1	0.2	2	0.5
<b>Race/ethnicity</b>						
European American/White	739	88.8	375	89.5	364	88.1
Native American/American Indian/Alaska Native/Indigenous	65	7.8	30	7.2	35	8.5
Asian/Asian American	40	4.8	18	4.3	22	5.3
Hispanic/Latino/a/x	50	6.0	27	6.4	23	5.6
African American/Black	13	1.6	9	2.1	4	1.0
Pacific Islander	10	1.2	6	1.4	4	1.0
Middle Eastern/North African	5	0.6	2	0.5	3	0.7
Unknown	3	0.4	1	0.2	2	0.5
<b>Sexual Orientation</b>						
Straight/Heterosexual	617	74.2	310	74.0	307	74.3
Bisexual/Pansexual	157	18.9	82	19.6	75	18.2
Asexual	29	3.5	14	3.3	15	3.6
Lesbian/Gay	22	2.6	9	2.1	13	3.1
Queer	2	0.2	2	0.5	0	0.0
Non-Labeled	1	0.1	1	0.2	0	0.0
Questioning	3	0.4	2	0.5	1	0.2
Unknown	2	0.2	0	0.0	2	0.5
<b>Year in college</b>						
Freshman/first year	477	57.3	244	58.2	233	56.4
Sophomore	156	18.8	79	18.9	58	14.0
Junior	109	13.1	51	12.2	39	9.4
Senior	68	8.2	34	8.1	27	6.5
5 <sup>th</sup> year and beyond	22	2.6	11	2.6	9	2.2

Note: Total percentages for demographics are beyond 100% because participants could select more than one category.

Abbreviations: ATOP, attitudes toward obese persons scale; ATOP-HW, attitudes toward persons with higher weight scale.

TABLE 2 Wording for the original ATOP and modified version (ATOP-HW).

Original version	Modified version
1. <b>Obese people are as happy as <i>nonobese</i> people.</b>	1. <i>Higher-weight</i> people are as happy as <i>thin</i> people.
2. Most <i>obese</i> people feel that they are not as good as other people.	2. Most <i>higher-weight</i> people feel that they are not as good as other people.
3. Most <i>obese</i> people are more self-conscious than other people.	3. Most <i>higher-weight</i> people are more self-conscious than other people.
4. <b>Obese workers cannot be as successful as other workers.</b>	4. <i>Higher-weight</i> workers cannot be as successful as other workers.
5. Most <i>nonobese</i> people would not want to marry anyone who is <i>obese</i> .	5. Most <i>thin</i> people would not want to marry anyone who has a <i>larger body</i> .
6. <b>Severely <i>obese</i> people are usually untidy.</b>	6. People with <i>very high weight</i> are usually untidy.
7. <i>Obese</i> people are usually sociable.	7. <i>Higher-weight</i> people are usually sociable.
8. Most <i>obese</i> people are not dissatisfied with themselves.	8. Most people with <i>higher-weight</i> are not dissatisfied with themselves.
9. <b>Obese people are just as self-confident as other people.</b>	9. People with <i>higher-weight</i> are just as self-confident as other people.
10. Most people feel uncomfortable when they associate with <i>obese</i> people.	10. Most people feel uncomfortable when they associate with people with <i>higher-weight</i> .
11. <i>Obese</i> people are often less aggressive than <i>nonobese</i> people.	11. <i>Higher-weight</i> people are often less aggressive than <i>thin</i> .
12. Most <i>obese</i> people have different personalities than <i>nonobese</i> people.	12. Most <i>larger bodied</i> people have different personalities than <i>thin</i> people.
13. Very few <i>obese</i> people are ashamed of their weight.	13. Very few <i>higher-weight</i> people are ashamed of their weight.
14. Most <i>obese</i> people resent normal weight people.	14. Most <i>higher-weight</i> people resent <i>thinner</i> people.
15. <b>Obese people are more emotional than <i>nonobese</i> people.</b>	15. People with <i>higher-weight</i> are more emotional than <i>thin</i> people.
16. <b>Obese people should not expect to lead normal lives.</b>	16. People with <i>higher-weight</i> should not expect to lead normal lives.
17. <i>Obese</i> people are just as healthy as <i>nonobese</i> people.	17. People with <i>higher-weight</i> are just as healthy as <i>thin</i> people.
18. <b>Obese people are just as sexually attractive as <i>nonobese</i> people.</b>	18. People in <i>larger bodies</i> are just as sexually attractive as <i>thin</i> people.
19. <i>Obese</i> people tend to have family problems.	19. People in <i>larger bodies</i> tend to have family problems.
20. <b>One of the worst things that could happen to a person would be for him to become <i>obese</i>.</b>	20. <b>One of the worst things that could happen to a person would be for them to become <i>higher weight</i>.</b>

Note: Modified language is shown in italics for ease of the reader. Items in bold were retained in the brief, final versions of the Attitudes Toward People with Higher Weight Persons Scale (ATOP-HW) and ATOP.

Abbreviation: ATOP, attitudes toward obese persons scale.

Next, half of the cases were randomly selected to be included in two confirmatory factor analyses (CFAs) to determine if the factor structures of the ATOP-HW and ATOP samples were consistent with the original ATOP factor structure.<sup>28</sup> The original study<sup>28</sup> identified a three-factor structure (Different Personality, Social Difficulties, and Self-Esteem). In both CFAs conducted, items were specified to load only on the items' first-order latent factor. The model fit was poor for the original ATOP, CFI = 0.767, TLI = 0.735, SRMR = 0.082, RMSEA = 0.080, 90% CI [0.070, 0.091],  $\chi^2(167, N = 202) = 385.13$ ,  $p < 0.001$ . The model fit was also poor for the ATOP-HW, CFI = 0.746, TLI = 0.711, SRMR = 0.078, RMSEA = 0.078, 90% CI [0.068, 0.089],  $\chi^2(167, N = 214) = 386.87$ ,  $p < 0.001$ .

Given the poor model fit for the three-factor solution, the commonly used unidimensional approach with the original ATOP,<sup>37</sup> and recent studies finding two-factor model fits,<sup>30,31</sup> the researchers conducted PCAs to determine an acceptable factor structure for the ATOP-HW. Data was deemed suitable for PCA, with numerous coefficients in the correlation matrix above 0.3, Kaiser-Meyer-Olkin of 0.818,<sup>38</sup> and a significant Bartlett's Test of Sphericity ( $p < 0.001$ ).<sup>39</sup>

The PCA identified five components with eigenvalues  $>1$ , which explained 24.3%, 9.7%, 7.8%, 6.4%, and 5.7% of the variance in the data. However, there was a clear break in the screeplot after the first factor, most items cross-loaded with component one, and one included less than three items on the component. As such, there was an exploration of a unidimensional solution for the ATOP-HW, which is also in line with how most research currently uses the original ATOP. The unidimensional solution explained 24.3% of the variance in the data. Only eight of the 20 items had communalities of at least 0.30, indicating at least fair fit.<sup>40</sup> The brief 8-item ATOP-HW maintained acceptable internal consistency (McDonald's Omega of 0.79; Cronbach's alpha of 0.79) and the items maintained and removed made theoretical sense (see Table 3 for factor loadings). When confirming the 8-item ATOP-HW in another PCA, the unidimensional solution explained 40.6% of the variance in the data, with all communalities above 0.30 and factor loadings above 0.45.

A PCA was also conducted on the original ATOP to determine if the ATOP-HW and ATOP factor structures mirror each other. Data was deemed suitable for PCA, with numerous coefficients in the

Item	ATOP-HW		ATOP	
	Factor loading	Communalities	Factor loading	Communalities
6.	0.66	0.43	0.62	0.39
5.	0.63	0.40	0.67	0.45
18.	0.62	0.38	0.68	0.46
4.	0.59	0.35	0.69	0.48
19.	0.58	0.34	0.49	0.24
15.	0.57	0.33	0.61	0.38
16.	0.56	0.32	0.61	0.38
20.	0.56	0.31	0.68	0.46
1.	0.54	0.29	0.57	0.32
10.	0.53	0.28	0.32	0.10
12.	0.52	0.27	0.43	0.18
9.	0.51	0.26	0.58	0.33
17.	0.48	0.23	0.53	0.28
3.	0.45	0.20	0.35	0.12
2.	0.43	0.18	0.47	0.22
14.	0.42	0.18	0.46	0.21
8.	0.22	0.05	0.18	0.03
11.	0.21	0.04	0.14	0.02
7.	0.12	0.02	0.19	0.04
13.	0.01	0.00	0.08	0.01

TABLE 3 ATOP-HW and ATOP principal components analyses.

Abbreviations: ATOP, attitudes toward obese persons scale; ATOP-HW, attitudes toward persons with higher weight.

correlation matrix above 0.3, Kaiser-Meyer-Olkin of 0.814,<sup>38</sup> and a significant Bartlett's Test of Sphericity ( $p < 0.001$ ).<sup>39</sup> Again, the PCA identified five components with eigenvalues  $>1$ , which explained 25.5%, 10.0%, 8.4%, 6.0%, and 5.3% of the variance in the data. Like with the ATOP-HW, there was a clear break in the screeplot after the first factor and most items cross-loaded with component one. As such, there was an exploration of a unidimensional solution for the ATOP, which aligns with how most research currently uses the original ATOP. The unidimensional solution explained 25.5% of the variance in the data. Nine of the 20 items had communalities of at least 0.30, indicating at least fair fit.<sup>41</sup> The ATOP retained one extra item than the ATOP-HW overall, and there were two unique items in the ATOP and 1 in the ATOP-HW. Using the same 8-items retained in the ATOP-HW PCA, the brief 8-item ATOP maintained good internal consistency (McDonald's Omega of 0.82; Cronbach's alpha of 0.82).

Finally, with the second half of the randomly split dataset, a CFA was conducted on the new 8-item ATOP-HW to verify the brief, 8-item factor structure in this second dataset. Items were specified to load only on the items' first-order latent factor. The 8-item ATOP-HW met the requirements for each of the fit indices, indicating that the model fit the data well, CFI = 0.978, SRMR = 0.042,

RMSEA = 0.045, 90% CI [0.000, 0.081],  $\chi^2$  (20,  $N = 199$ ) = 28.14,  $p = 0.106$ .

## 4 | DISCUSSION

The present study examined the implications of changing the language used to describe individuals in the ATOP measure from "obesity/obese" to "higher weight." The study sought to revise potentially stigmatizing language within a commonly used measure of weight stigma while retaining reliability and validity. The results showed a statistically significant difference in the endorsement of weight-based stigma between the two versions of the ATOP (original and modified). Specifically, participants who were given the version of the ATOP with less stigmatizing language (i.e., higher weight) endorsed slightly less stigmatizing beliefs than individuals who completed the original version (i.e., obese/obesity). It is possible that using less stigmatizing language results in slightly lower weight stigma, or the original ATOP slightly magnifies negative attitudes. However, the practical significance of the differences was very small or small depending on effect size indices, and the ATOP-HW mean was similar to the ATOP mean found in previous studies with student



participants for example.<sup>42</sup> The internal consistency was good for the ATOP-HW. These findings support a revised version of ATOP used to measure negative attitudes toward those with higher weight, without greatly sacrificing psychometric properties, but potentially capturing slightly lower endorsement of weight stigma than the traditional ATOP.

Researchers should further examine how participants conceptualize the individuals described in weight stigma measures. Future research should focus on whether any size- or weight-related terms (e.g., obese, higher-weight, fat) are interpreted differently for some respondents. Instead of capturing feelings about individuals living in larger bodies, participants may instead be endorsing their feelings toward individuals with metabolic conditions who are living in higher weights. Assumptions about the health of the individuals described may impact their endorsement of stigmatizing beliefs rather than solely body size or appearance. The conflation of health and weight within many conceptualizations of obesity may similarly impact respondents' endorsements of stigmatizing beliefs.

The original and modified versions of the ATOP also performed similarly in an examination of their factor structure. This investigation did not replicate the three-factor structure (Different Personality, Social Difficulties, and Self-Esteem) identified in the original ATOP validation study in either sample (original or modified ATOP). Instead, the investigation identified a briefer, unidimensional structure that retained eight of the 20 items on the modified ATOP-HW. These findings are consistent with the existing literature as very few studies have successfully replicated the original ATOP three-factor structure.<sup>28</sup> Of note, most studies already use the ATOP as a unidimensional measure of weight-stigmatizing attitudes,<sup>36</sup> despite the original three-factor structure, which our finding support.

In looking at the items removed from the unidimensional modified ATOP, these removed items mostly required respondents to assume the internal feelings or perspectives of those with higher weight (e.g., "Very few higher-weight people are ashamed of their weight," "Most higher-weight people feel that they are not as good as other people"). It may be that these internal self-esteem items do not consistently fit the other weight stigma items that focus more on negative perceptions of personality and attributes (e.g., "People with very high weight are usually untidy," "People in larger bodies are just as sexually attractive as thin people"). Indeed, the items retained make theoretical sense, and the brief, 8-item ATOP-HW appears a face-valid measure for contemporary negative attitudes toward those with higher weight without making assumptions about the internal feelings of others and reducing burden for participants completing the ATOP-HW. Importantly, the follow-up CFA verified the brief, 8-item factor structure in the second dataset, finding the model fit the data well. Future research should continue refining the field's measurement of weight stigmatizing attitudes, especially as these attitudes may transform with cultural changes throughout time.

Given the stigma of the term "obesity" identified by people with lived experience<sup>16,17</sup> and the inconsistent meaning and uses of "obese" and "obesity",<sup>22,43</sup> it may be useful for researchers to refine

existing measurements of anti-fat weight bias to a more descriptive and neutral term to describe people's body size. Of note, our examination of revised language includes only some terminology options, and there may be variability among people with lived experience of higher weight in terms of preferred terms (e.g., fat, higher-weight, etc.). As language and perceptions about weight evolve through time, researchers should continue to explore psychometrically sound yet inclusively worded research measures. Though scores on the ATOP and ATOP-HW were statistically different, with the small effect size, it is unknown whether the different endorsements of weight stigma are practically meaningful in the real world. Peer-reviewed journals and health organizations are encouraging researchers and health care providers to differentiate between higher-weight and higher-weight with adverse health outcomes (e.g., Ref. 21,23), yet the field knows little about how changing these terms may change the level of negative attitudes toward people with higher weight. If all it took to significantly reduce the endorsement of stigma was to swap out the language used to describe patients, then this speaks to the potential utility of interventions in the healthcare domain that push for not only person-first language, but also the replacement of the word obesity with a neutral descriptor of size instead. More longitudinal research and more intervention studies are needed to understand whether the change of language can have significant and enduring impacts on the endorsement of stigma and stigmatizing beliefs. Future research should consider using qualitative or mixed-methods research to better understand how the general population conceptualizes each of these constructs and how these relate to stigmatizing beliefs about those with higher weight.

Though this research has important implications, there are several limitations that acknowledge and address in future research. First, our sample is a generally age-restrictive, majority White college student population, which could impact generalizability. Though this sample contained a distribution of weights, the proportion of people with higher weight was lower than the United States average.<sup>44</sup> Future research should consider validating the ATOP-HW in other populations, including healthcare professionals, individuals in larger bodies, and diverse community samples, to assess measurement invariance across populations. Furthermore, this study was also strictly quantitative, which means it is unknown how participants conceptualized the individuals described in the measures. Future research should focus on whether any size- or weight-related terms (e.g., obese, higher-weight, fat) are interpreted differently for some respondents. Further examination of the terminology used in research contexts is needed to determine how to best assess weight stigma without reinforcing stigmatizing attitudes.

## 5 | CONCLUSION

In conclusion, this study provides initial support for modernizing the ATOP by shifting its use to a brief, 8-item ATOP-HW that uses neutral language to describe body size. As researchers aiming to

understand and document the harms associated with weight-related bias and discrimination, it is crucial that researchers do not perpetuate the stigma through what measures are being used in the research. The findings of the present study suggest that the use of neutral terms in measures of anti-fat bias is a promising solution that warrants further investigation. It is vital that scholars remain critical of research methods and measures, reaffirming their relevance and validity as cultural norms about language and weight continue to change. The present study represents an important first step in this process.

#### AUTHOR CONTRIBUTIONS

**Caitlin A. Martin-Wagar:** Conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing original draft, writing review and editing. **Katelyn A. Melcher:** Data curation, formal analysis, visualization, writing original draft. **Sarah E. Attaway:** Data curation, formal analysis, writing original draft. **Brooke L. Bennett:** Conceptualization, methodology, visualization, writing original draft, writing review and editing. **Connor J. Thompson:** Investigation, writing original draft. **Oscar Kroenberger:** Investigation, writing original draft. **Taylor E. Penwell:** Visualization, writing original draft. All authors have read and approved the final manuscript.

#### ACKNOWLEDGMENTS

This research was supported by the National Institute of General Medical Sciences of the National Institutes of Health, Award Number P20GM130418.

#### CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

#### DATA AVAILABILITY STATEMENT

The datasets generated and/or analyzed during the current study are available in the Open Science Framework repository, <https://osf.io/cn7fv>.

#### ORCID

Caitlin A. Martin-Wagar  <https://orcid.org/0000-0003-4284-9777>

#### REFERENCES

- Lee KM, Hunger JM, Tomiyama AJ. Weight stigma and health behaviors: evidence from the Eating in America Study. *Int J Obes*. 2021;45(7):1499-1509. <https://doi.org/10.1038/s41366-021-00814-5>
- Puhl RM, Himmelstein MS, Pearl RL. Weight stigma as a psychosocial contributor to obesity. *Am Psychol*. 2020;75(2):274-289. <https://doi.org/10.1037/amp0000538>
- Vartarian LR, Smyth JM. Primum non nocere: obesity stigma and public health. *J bioeth Inq*. 2013;10(1):49-57. <https://doi.org/10.1007/s11673-012-9412-9>
- Hunger JM, Dodd DR, Smith AR. Weight discrimination, anticipated weight stigma, and disordered eating. *Eat Behav*. 2020;37:101383. <https://doi.org/10.1016/j.eatbeh.2020.101383>
- Alimoradi Z, Golboni F, Griffiths MD, Broström A, Lin CY, Pakpour AH. Weight-related stigma and psychological distress: a systematic review and meta-analysis. *Clin Nutr*. 2020;39(7):2001-2013. <https://doi.org/10.1016/j.clnu.2019.10.016>
- Papadopoulos S, Brennan L. Correlates of weight stigma in adults with overweight and obesity: a systematic literature review. *Obesity*. 2015;23(9):1743-1760. <https://doi.org/10.1002/oby.21187>
- Himmelstein MS, Puhl RM, Quinn DM. Weight stigma and health: the mediating role of coping responses. *Health Psychol*. 2018;37(2):139-147. <https://doi.org/10.1037/hea0000575>
- Simone M, Hooper L, Eisenberg ME, Neumark-Sztainer D. Unhealthy weight control behaviors and substance use among adolescent girls: the harms of weight stigma. *Soc Sci Med*. 2019;233:64-70. <https://doi.org/10.1016/j.socscimed.2019.05.047>
- Puhl RM, Lessard LM. Weight stigma in youth: prevalence, consequences, and considerations for clinical practice. *Curr Obes Rep*. 2020;9(4):402-411. <https://doi.org/10.1007/s13679-020-00408-8>
- van Vuuren CL, Wachter GG, Veenstra R, et al. Associations between overweight and mental health problems among adolescents, and the mediating role of victimization. *BMC Publ Health*. 2019;19:1-10. <https://doi.org/10.1186/s12889-019-6832-z>
- Mensingher JL, Tylka TL, Calamari ME. Mechanisms underlying weight status and healthcare avoidance in women: a study of weight stigma, body-related shame and guilt, and healthcare stress. *Body Image*. 2018;25:139-147. <https://doi.org/10.1016/j.bodyim.2018.03.001>
- Himmelstein DU, Jun M, Busse R, et al. A comparison of hospital administrative costs in eight nations: US costs exceed all others by far. *Health Aff*. 2014;33(9):1586-1594. <https://doi.org/10.1377/hlthaff.2013.1327>
- Jackson SE, Steptoe A. Association between perceived weight discrimination and physical activity: a population-based study among English middle-aged and older adults. *BMJ Open*. 2017;7(3):e014592. <https://doi.org/10.1136/bmjopen-2016-014592>
- Tomiyama AJ. Weight stigma is stressful. A review of evidence for the Cyclic Obesity/Weight-Based Stigma model. *Appetite*. 2014;82:8-15. <https://doi.org/10.1016/j.appet.2014.06.108>
- Schvey NA, Puhl RM, Brownell KD. The stress of stigma: exploring the effect of weight stigma on cortisol reactivity. *Psychosom Med*. 2014;76(2):156-162. <https://doi.org/10.1097/psy.0000000000000031>
- Puhl RM, Peterson JL, Luedicke J. Motivating or stigmatizing? Public perceptions of weight-related language used by health providers. *Int J Obes*. 2013;37(4):612-619. <https://doi.org/10.1038/ijpo.2012.110>
- Puhl RM, Lessard LM, Pudney EV, Foster GD, Cardel MI. Motivations for engaging in or avoiding conversations about weight: adolescent and parent perspectives. *Pediatr Obes*. 2022;17(12):e12962. <https://doi.org/10.1111/ijpo.12962>
- American Psychological Association. Inclusive language guide. n.d. [WWW document]. <https://www.apa.org/about/apa/equity-diversity-inclusion/language-guidelines>
- Meadows A, Daniëlsdóttir S. What's in a word? On weight stigma and terminology. *Front Psychol*. 2016;7:217859. <https://doi.org/10.3389/fpsyg.2016.01527>
- Liebowitz C (2015). I am disabled: on identity-first versus people-first language. [WWW document]. <http://thebodyisnotanapology.com/magazine/i-am-%20disabled-on-identity-%20first-versus-people-%20first-language/>
- National Institute of Health. Obesity and people with higher weight. [WWW document]. <https://www.nih.gov/nih-style-guide/obesity>
- Nutter S, Eggerichs LA, Nagpal TS, et al. Changing the global obesity narrative to recognize and reduce weight stigma: a position statement from the World Obesity Federation. *Obes Rev*. 2024;25(1):e13642. <https://doi.org/10.1111/obr.13642>
- World Health Organization. Obesity. 2024. [WWW document]. [https://www.who.int/health-topics/obesity#tab=tab\\_1](https://www.who.int/health-topics/obesity#tab=tab_1)



24. Centers for Disease Control and Prevention. Defining adult overweight & obesity. 2022. [WWW document]. <https://www.cdc.gov/obesity/basics/adult-defining.html>
25. Okorodudu DO, Jumean MF, Montori VM, et al. Diagnostic performance of body mass index to identify obesity as defined by body adiposity: a systematic review and meta-analysis. *Int J Obes*. 2010;34(5):791-799. <https://doi.org/10.1038/ijo.2010.5>
26. Durso LE, Latner JD. Understanding self-directed stigma: development of the weight bias internalization scale. *Obesity*. 2008;16(S2):s80-s86. <https://doi.org/10.1038/oby.2008.448>
27. Pearl RL, Puhl RM. Measuring internalized weight attitudes across body weight categories: validation of the modified weight bias internalization scale. *Body Image*. 2014;11(1):89-92. <https://doi.org/10.1016/j.bodyim.2013.09.005>
28. Allison DB, Basile VC, Yunker HE. The measurement of attitudes toward and beliefs about obese persons. *Int J Eat Disord*. 1991;10(5):599-607. [https://doi.org/10.1002/1098-108x\(199109\)10:5<599::aid-eat2260100512>3.0.co;2-#](https://doi.org/10.1002/1098-108x(199109)10:5<599::aid-eat2260100512>3.0.co;2-#)
29. Obesity Action Coalition. People-first language. [WWW document]. <https://www.obesityaction.org/action-through-advocacy/weight-bias/people-first-language/>
30. Ambwani S, Thomas KM, Hopwood CJ, Moss SA, Grilo CM. Obesity stigmatization as the status quo: structural considerations and prevalence among young adults in the US. *Eat Behav*. 2014;15(3):366-370. <https://doi.org/10.1016/j.eatbeh.2014.04.005>
31. Marek RJ, Ivezaj V, Schuh L, Creel D, Grilo CM. Factor structure and measurement invariance of the Attitudes toward Persons with Obesity (ATOP) Scale in a preoperative and postoperative bariatric surgery sample. *Obes Surg*. 2021;31(12):5207-5212. <https://doi.org/10.1007/s11695-021-05645-x>
32. R Core Team. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing; 2019.
33. Rosseel Y. lavaan: an R package for structural equation modeling. *J Stat Software*. 2012;48:1-36.
34. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Model*. 1999;6:1-55.
35. Thompson B. *Exploratory and Confirmatory Factor Analysis: Understanding Concepts and Applications*. American Psychological Association; 2004.
36. Parent MC. Handling item-level missing data: simpler is just as good. *Counsel Psychol*. 2013;41:568-600.
37. Tsai MC, Strong C, Latner JD, et al. Attitudes toward and beliefs about obese persons across Hong Kong and Taiwan: wording effects and measurement invariance. *Health Qual Life Outcome*. 2019;17:1-11.
38. Kaiser HF. An index of factorial simplicity. *Psychometrika*. 1974;39:31-36.
39. Bartlett MS. A note on the multiplying factors for various  $\chi^2$  approximations. *J R Stat Soc Series B Stat Methodol*. 1954:296-298.
40. Tabachnick BG, Fidell LS. *Using Multivariate Statistics*. 7th ed. Pearson; 2019.
41. Comrey AL, Lee HB, eds. *A first course in factor analysis*. 2nd ed. Lawrence Erlbaum Associates; 1992.
42. Oliver TL, Bing-Bong Q, Shenkman R, Diewald L, Smeltzer SC. Weight sensitivity training among undergraduate nursing students. *J Nurs Educ*. 2020;59:453-456.
43. Purnell JQ. Definitions, classification, and epidemiology of obesity. In: *Endotext*. MDText.com, Inc.; 2015. South Dartmouth.
44. Stierman B, Afful J, Carroll MD, et al. *National Health and Nutrition Examination Survey 2017–March 2020 Prepandemic Data Files—Development of Files and Prevalence Estimates for Selected Health Outcomes*. Vol 158. National Center for Health Statistics; 2021:1-20.

**How to cite this article:** Martin-Wagar CA, Melcher KA, Attaway SE, et al. Does terminology matter when measuring stigmatizing attitudes about weight? Validation of a brief, modified attitudes toward obese persons scale. *Obes Sci Pract*. 2024;e70005. <https://doi.org/10.1002/osp4.70005>