

ORIGINAL ARTICLE

Weighing obesity stigma: the relative strength of different forms of bias

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Objective: To compare the strength of weight bias to other common biases, and to develop a psychometrically sound measure to assess and compare bias against different targets.

Subjects: A total of 368 university students (75.4% women, 47.6% white, mean age: 21.53 years, mean body mass index (BMI): 23.01 kg/m²).

Measurements: A measure was developed to assess bias against different targets. Three versions of the universal measure of bias (UMB) were developed and validated, each focusing on either 'fat,' 'gay' or 'Muslim' individuals. These were administered to participants, along with two established scales of bias against each target and a measure of socially desirable response style.

Results: The UMB demonstrated good internal consistency, appropriate item-total and inter-item correlations, and a clear factor structure suggesting components of Negative Judgment, Distance, Attraction and Equal Rights. Construct validity was indicated by strong correlations between established measures of bias and each corresponding version of the new scale. In contrast to previously established measures of weight bias, the new measure was independent of socially desirable response style. Although homosexual orientation was associated with lower gay bias ($P < 0.05$), greater BMI was not associated with any decrease in weight bias. When comparing the relative strength of bias against different targets, weight bias was significantly greater than bias against both gays and Muslims ($P < 0.001$).

Conclusion: Weight bias is significantly stronger than other major targets of bias. This is the first study to develop a universal measure to assess bias against different targets. The excellent psychometric properties of this measure will permit further investigation into the relative severity of different types of prejudice over time and across samples. The present findings suggest that the pervasive discrimination against obese individuals may be more socially acceptable than discrimination against other groups.

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Introduction

In their comprehensive review of weight bias and discrimination, Puhl and Brownell¹ suggested that 'obese persons are the last acceptable targets of discrimination' (p 788). This assertion has been made by others as well, based on the widespread evidence of weight bias in employment, medical, educational and interpersonal settings.² Indeed, there is little legal recourse available to combat weight bias. Whereas many other targets of discrimination are discouraged by legal deterrents, few such rules or precedents are in place to

protect against weight-based discrimination. Weight-biased attitudes and weight-based discrimination are still common in many settings^{1,3} and may even be increasing over time.⁴

Although social norms regarding behavior, at least in westernized countries, suppress overt prejudice in various domains (that is, gender, race, sexual orientation and religion), similar protection from weight bias may not exist. (The terms 'bias' and 'prejudice' are used here as synonyms indicating preconceived adverse judgment and unfair treatment.) Indeed, a 'politically correct' response style of completely denying any degree of prejudice was more common in response to a scale about racism⁵ than in response to a scale about dislike of fat people.⁶ Similarly, subjects made more favorable ratings of a confederate when she expressed prejudice toward fat people than when she expressed prejudice toward black people.⁶ It therefore seems

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both timely and important to assess the degree of weight bias relative to other common biases in modern society, such as sexual orientation and religious minority groups. Knowledge about which prejudices are most prevalent in our society may help inform where change is most needed, such as improvements in attitudes and protective policies. Research has begun to examine effective ways to change people's biased attitudes against obese individuals.⁷⁻⁹ If weight bias turns out to be one of the strongest areas of current prejudice, more resources and efforts will be needed to combat it.

Several of the earliest studies of weight stigma used a comparative approach to evaluate the relative dislike of obese individuals compared to other stigmatized groups. This series of studies showed consistent results across participants of different ages and ethnic backgrounds: obese children were the most disliked among a group of children with disabilities and disfigurements.¹⁰⁻¹² The forced-choice ranking procedure used in these studies, recently updated using computerized technology,¹³ is especially convenient for administration to children due to its clarity and simplicity. However, bias is a multidimensional construct, and research has not yet directly compared the complex construct of bias against obese people to bias against other groups.

The major barrier to comparing the strength of different biases is the lack of uniformity across assessment measures. It is not possible to draw conclusions based on comparisons between existing measures of bias, as they often have very different content. For example, items on measures of weight bias make reference to eating behaviors (for example, 'Most fat people buy too much junk food,' 'It's disgusting to see fat people eating').¹⁴ Measures of homophobia make reference to issues of sexuality and gay marriage (for example, 'Female homosexuality is an inferior form of sexuality,' 'The idea of male homosexual marriages seems ridiculous to me').¹⁵ Measures of racism and religious intolerance also refer to social issues pertinent to specific groups (for example, 'Blacks have more influence upon school desegregation plans than they ought to have').⁵ A universal and uniform scale of bias would tap into the underlying domains associated with bias across different targets, rather than target-specific issues. Such a measure would allow relative biases to be assessed by inserting the name of the target group into the scale questions. A uniform measure of bias would also be useful for examining and comparing the correlates of different biases with other constructs that might be differentially associated with specific targets of bias, such as socially desirable response styles or educational level.

The purpose of the present study was to develop a universal measure of bias (UMB) and to assess its reliability and validity. Using this new scale, the present study also aimed to compare the magnitude of bias against obese people to the magnitude of bias against two other types of minority groups: minorities based on sexual orientation (homosexual) and religious faith (Muslim). These targets of

bias were selected because they are common targets of prejudice in Western society, which is currently debating issues related to gay rights/discrimination and is facing prejudice against Muslims in the aftermath of September 11, 2001 (in contrast, it is likely that expressing racial bias may be more 'politically incorrect'). It was hypothesized that a psychometrically sound UMB could be constructed and its concurrent validity established through a comparison to existing measures of bias. It was also hypothesized that this new universal measure would have no significant relationship with socially desirable response styles, which would suggest the measure's independence from participants' desire to appear unprejudiced. Finally, we also hypothesized that relative to other biases, weight bias would be the strongest.

Methods

Participants

Three cohorts of participants were recruited. The first cohort included 105 students from undergraduate Psychology classes at the University of Otago (New Zealand). These participants completed the obesity version of the Universal Measure of Bias—fat version (UMB-FAT), which refers to 'fat people' as the target group. They also completed the dislike and willpower subscales of the Antifat Attitudes (AFA) scale,⁶ along with demographic information about sex, age, height, weight and ethnicity. The second cohort included 117 students from undergraduate Psychology classes at the University of Hawaii (Honolulu, HI, USA). These participants completed three versions of the UMB, each version referring to either 'fat,' 'gay' or 'Muslim' individuals, along with two additional established measures of each of these types of bias (described below), for a total of three measures of bias per target category. Only demographic information about sex was collected for this cohort. The third cohort included 147 additional students from undergraduate Psychology classes at the University of Hawaii, who completed the same nine measures of bias, as well as the Marlowe-Crowne Social Desirability scale¹⁶ and demographic information about sex, age, height, weight, ethnicity, education, marital status and sexual orientation (using a seven-point Kinsey scale). All students who attended these courses chose to participate in the study. Thus, participants from New Zealand were included in analyses examining the UMB-FAT and the AFA scale, and participants from the United States were included in analyses involving these and all other measures of bias. The resulting 368 participants consisted the total sample.

Measures

Weight bias. The Attitudes Towards Obese Persons scale (ATOP)¹⁷ is a 20-item measure that broadly assesses negative judgments about obese individuals' personalities, social functioning and self-esteem. The scale has demonstrated reliability and validity, and items are rated on a six-point

Likert scale (I strongly agree to I strongly disagree). Scales were scored so that higher ratings indicated greater bias (sample item: 'Most fat people resent normal weight people.'). The AFA scale⁶ is a 13-item measure of weight bias. The scale has adequate internal consistency and has shown convergence with other measures of prejudice and blame. Items are rated on a 10-point Likert scale (Very strongly disagree to Very strongly agree), with higher scores indicating greater bias (sample item: 'I really don't like fat people much.'). The seven-item subscale assessing dislike of obese people was used here, as the original 13-item measure is not unidimensional (for example, its fear of fat subscale was uncorrelated with dislike).⁶

Homosexuality bias. The Homophobia Scale (HS) is a 25-item measure of the cognitive, affective and behavioral components of homophobia.¹⁸ It has demonstrated internal consistency, test-retest reliability and concurrent validity. Items are rated on a five-point Likert scale (Strongly agree to Strongly disagree), and higher scores indicate greater bias (sample item: 'I fear homosexual persons will make sexual advances towards me.'). The Lesbian, Gay, and Bisexual Knowledge and Attitudes Scale for Heterosexuals (LGB-KASH)¹⁹ is a 28-item multidimensional measure of attitudes and knowledge about lesbian, gay and bisexual individuals. It has adequate internal consistency, stability, and convergent and discriminant validity. Items are rated on a seven-point Likert scale (Very uncharacteristic of me or my views to Very characteristic of me or my views), and higher scores indicate greater bias (sample item: 'It is important for me to avoid LGB individuals.'). Three subscales of the LGB-KASH, Hate, Civil Rights and Religious Conflict, were administered (18 items). Subscales assessing knowledge of history, symbols and community, and internalized affirmativeness were not included as they do not directly assess bias.

Muslim bias. The Attitudes Toward Muslims Scale (ATMS)²⁰ is a 25-item measure that assesses several components of bias against Muslims as a religious group. The scale has been demonstrated to have adequate internal consistency and construct validity. Responses are made on a six-point Likert scale (Strongly disagree to Strongly agree; sample item: 'Muslims should be feared.'). It was scored so that higher scores indicated greater bias. The Subtle and Blatant Prejudice (SBP) scale was originally designed to measure prejudice against individuals from the West Indies.²¹ The 19-item scale was adapted by Coryn *et al.*²² to assess prejudice against Arabic people in the aftermath of September 11, 2001. This adaptation of the scale demonstrated good internal consistency and predictive validity. The present version used the Coryn *et al.*²² version of the scale, but substituted the term Muslim for Arabic. Responses are made on a six-point Likert scale (differing depending on the item format). Higher scores indicate greater bias (sample item: 'I would NOT mind if a suitably qualified Muslim person was appointed as my boss.'). Four items asking respondents how

different Muslims are from themselves (in values, religion, sexual practices and language) were removed as they were not considered necessarily to reflect bias. The resulting 15-item measure was administered to participants, with higher scores reflecting greater bias.

Socially desirable response style. A brief form of the Marlowe-Crowne Social Desirability (MCSD) scale²³ was used. This 13-item version of the scale has been demonstrated to have acceptable reliability and concurrent validity, with strong correlations to the original version and to other measures of socially desirable responding.¹⁶ Items are scored as true or false, and higher scores indicate more a socially desirable response style (sample item: 'No matter who I'm talking to, I'm always a good listener.').

Construction of the universal measure of bias. On the basis of guidelines for scale construction and content validation,^{24,25} an overinclusive initial pool of items was generated based on broadly conceptualized domains and components of stigma and bias. These domains included negative judgments about character, behavior, morality, discomfort with proximity and intimacy, attraction and disgust, and equal rights. Items were also modeled on other assessment measures of bias against obesity and other targets (homosexuality, homelessness, racism and religious intolerance).^{5,14,19,20,26,27} Attention was paid to the clarity and simplicity of the phrasing of each item. Effort was made to choose items that would be appropriate for a number of different targets of bias. For example, it may be unrealistic to ask heterosexual subjects about their likelihood of dating a person who is gay; therefore, questions about attraction were phrased in a more inclusive manner (for example, finding a person sexy or romantic). In addition, an effort was made to include questions concerning equal and civil rights, as these issues are an important aspect of discrimination against minority groups. However, despite evidence of prejudice in employment and education practices affecting the equal rights and opportunities of obese individuals,²⁸⁻³² equal rights have been neglected in previous measures of weight bias.

After the development of scale items, an initial 48-item measure was administered to participants. Items were rated on a seven-point Likert scale (Strongly agree to Strongly disagree), with higher scores indicating greater bias. Half (24) of the items were reverse-coded. Three versions were constructed by inserting the target category labels of 'fat' (UMB-FAT), 'gay' (UMB-GAY) and 'Muslim' (UMB-MUS), in keeping with previous measures and with popular terminology used in describing each of these groups. Questionnaires were administered in counterbalanced order across participants. These procedures were approved by the University of Hawaii's and University of Otago's institutional review boards. Students received course credit for participating.

Results

Sample characteristics

The majority (75.4%) of the sample were women. Participants' mean age (s.d.) was 21.53 (4.62) years, and their mean body mass index (BMI) was 23.01 kg/m² (4.15). The sample was 83.4% single, and 15.9% were married or cohabitating. The majority were exclusively or predominantly heterosexual (96.6%), and 3.5% were bisexual or predominantly homosexual. Whites comprised 47.6% of the sample, and 39.9% were Asian or Asian American, 3.2% Pacific Islander, 2.4% Hispanic, 2.0% Hawaiian, 1.6% New Zealand Maori, 1.2% African American, 0.4% Alaskan Native and 1.6% self-identified as an unspecified mixed ethnicity. (Among other participants indicating mixed ethnic backgrounds, the primary identification listed was used in the above categorization.) The majority (70.7%) of participants were normal weight (BMI 18.5–24.9), 13.8% were overweight (BMI 25–29.9), 8.1% were obese (BMI ≥ 30) and 7.3% were underweight (BMI < 18.5).

Differences between the US and New Zealand samples, and between ethnic groups and men and women within the sample as a whole, were examined using independent samples *t*-tests. There were no significant differences between the US and New Zealand samples in BMI. However, the US sample was older (22.39 vs 20.34 years; $t(247) = 3.53$, $P < 0.001$). The US sample also had greater ethnic diversity (percent white: 24 vs 80%). A comparison of the two largest ethnic groups in the overall sample, Asians and whites, revealed different patterns of bias. Although Asians had lower weight bias than whites, as shown on the AFA and ATOP ($t(215) = 2.30$, $P < 0.05$; $t(119) = 2.71$, $P < 0.01$, respectively), whites had lower gay and Muslim bias than Asians, as shown on the HS, LGB-KASH and SBP ($t(119) = -3.22$, $P < 0.005$; $t(119) = -2.52$, $P < 0.05$; $t(119) = -3.48$, $P < 0.001$, respectively). Finally, men showed greater bias than women on the UMB-FAT, UMB-GAY and HS ($t(248) = 3.71$, $P < 0.001$; $t(144) = 4.18$, $P < 0.001$; $t(144) = 3.49$, $P < 0.005$, respectively).

Scale refinement

Initial screening procedures were used to eliminate items from the original scale. Several tests of internal consistency were conducted to evaluate how well the set of items measured a single unidimensional latent construct, and how well the items that reflect the same construct yielded similar results. First, items that yielded an item-total correlation of less than 0.4 in any of the three scale versions tested (UMB-FAT, UMB-GAY or UMB-MUS) were deleted from all three of the scales, resulting in the deletion of six items. The resulting 42-item scales had adequate Cronbach's α (UMB-FAT: 0.93, UMB-GAY: 0.96, UMB-MUS: 0.96), providing initial evidence of internal consistency. Cronbach's α values for this initial 42-item UMB-FAT, administered across two sites, were examined separately from University of Otago (0.92) and University of

Hawaii participants (0.94). The similar internal consistency, lack of mean differences across sites ($t(365) = 1.38$, not significant) and similar correlations with AFA ($r = 0.69$ and 0.63 , respectively) led to the combination of samples for scale refinement and construct validity procedures, with subsequent independent replication analyses reported below.

Exploratory factor analysis was performed on the UMB-FAT to extract principal components, using Varimax rotation, in an attempt to identify underlying variables that may explain the pattern of correlations within the set of items and identify whether a small number of factors may explain much of the variance observed. Four factors emerged with eigenvalues over 2, accounting for 46.06% of the variance. These factors appeared to encompass the constructs of Negative Judgment (14.98% of variance), discomfort with proximity or Distance (12.88% of variance), Attraction (9.45% of variance) and Equal Rights (8.75% of variance). The same factor analysis was conducted for the two other versions of the scale, and the results were similar (as discussed further below).

To consolidate the scale into a briefer and more usable version, five items with the highest factor loading from each factor were selected from the UMB-FAT, resulting in a 20-item version. Although selected from the loadings of the UMB-FAT, these items also loaded highly on one factor of each of the other two versions as well. The resulting 20-item versions of the scale had adequate internal consistency (Cronbach's α : UMB-FAT: 0.87, UMB-GAY: 0.91, UMB-MUS: 0.91) and a mean inter-item correlation in the desirable moderate range (UMB-FAT: 0.25, UMB-GAY: 0.33, UMB-MUS: 0.34). Corrected item-total correlations were above 0.4 on all three scale versions. Factor analysis to extract principal components, using Varimax rotation, was performed again on the weight bias version of the scale. The same four factors emerged, accounting for 59.19% of the variance (16.15% Equal Rights, 16.15% Attraction, 15.65% Negative Judgment and 11.24% Distance), and all factor loadings were at least 0.4, as shown in Table 1.

Factor structure of the UMB-GAY was similar to that of the UMB-FAT, with the four factors accounting for 62.62% of the variance (18.45% Attraction, 16.31% Negative Judgment, 13.99% Distance and 13.87% Equal Rights). All factor loadings were greater than 0.4. For the UMB-MUS, three factors emerged, due to the combination of items from Negative Judgment and Distance; these three factors accounted for 58.97% of the variance (27.38% Negative Judgment/Distance, 15.84% Attraction, 15.75% Equal Rights). All factor loadings were greater than 0.4 except for one item (0.34), as shown in Table 1. This 20-item version of the scale was used in all subsequent analyses.

Construct validity

To examine whether the UMB scales measured the variables that they purport to measure, their associations with

Table 1 Scale items and factor loadings of the 20-item versions of the UMB

Factor	Item	Loading (UMB-FAT)	Loading (UMB-GAY)	Loading (UMB-MUS)
1	___people tend toward bad behavior ^a	0.77	0.76	0.77
	___ people are sloppy ^a	0.65	0.76	0.76
	Sometimes I think that ___ people are dishonest ^a	0.73	0.72	0.77
	___ people have bad hygiene ^a	0.72	0.55	0.69
	In general, ___ people don't think about the needs of other people ^a	0.65	0.75	0.80
2	I would not want to have a ___ person as a roommate ^a	0.53	0.52	0.68
	I like ___ people.	0.59	0.55	0.45
	I don't enjoy having a conversation with a ___ person ^a	0.54	0.54	0.64
	I would be comfortable having a ___ person in my group of friends.	0.68	0.75	0.64
	I would like having a ___ person at my place of worship or community center.	0.74	0.55	0.53
3	I find ___ people attractive.	0.81	0.80	0.79
	___ people make good romantic partners.	0.62	0.71	0.75
	I find ___ people to be sexy.	0.82	0.84	0.74
	___ people are a turn-off ^a	0.65	0.72	0.65 ^b
	I find ___ people pleasant to look at.	0.76	0.72	0.67
4	Special effort should be taken to make sure that ___ people have the same rights and privileges as other people.	0.76	0.49	0.71
	Special effort should be taken to make sure that ___ people have the same salaries as other people.	0.85	0.81	0.86
	Special effort should be taken to make sure that ___ people have the same educational opportunities as other people.	0.90	0.89	0.86
	Special effort should be taken to make sure that ___ people have the same housing opportunities as other people.	0.88	0.87	0.90
	I try to understand the perspective of ___ people.	0.40	0.65 ^b	0.34 ^c

Abbreviations: UMB-FAT, UMB-GAY, UMB-MUS, universal measure of bias: fat, gay and Muslim versions, respectively. Items are rated on a 7-point scale from Strongly agree to Strongly disagree. Factor 1 reflects Negative Judgment, factor 2 Distance, factor 3 Attraction and factor 4 Equal Rights. For the UMB-MUS, a three-factor solution emerged with factors 1 and 2 loaded onto a single factor. ^aReverse coded. ^bLoaded onto factor 2. ^cLoaded onto factor 3.

Table 2 Correlations between measures of bias

Variable	1	2	3	4	5	6	7	8	9	10
1. UMB-FAT	—	0.58**	0.50**	0.60**	0.46**	0.37**	0.63**	0.48**	0.42**	−0.15
2. AFA		—	0.52**	0.42**	0.41**	0.35**	0.44**	0.43**	0.45**	−0.21*
3. ATOP			—	0.36**	0.33**	0.30**	0.42**	0.45**	0.42**	−0.25**
4. UMB-GAY				—	0.81**	0.68**	0.65**	0.54**	0.54**	0.03
5. HS					—	0.82**	0.54**	0.56**	0.59**	0.00
6. LGB-KASH						—	0.47**	0.52**	0.56**	0.07
7. UMB-MUS							—	0.77**	0.70**	−0.05
8. ATMS								—	0.73**	−0.10
9. SBP									—	−0.02
10. MCSD										—

Abbreviations: AFA, Antifat Attitudes scale; ATMS, Attitudes Towards Muslims Scale; ATOP, Attitudes Towards Obese Persons scale; HS, Homophobia Scale; LGB-KASH, Lesbian, Gay, and Bisexual Knowledge and Attitudes Scale for Heterosexuals; MCSD, Marlowe-Crowne Social Desirability scale; SBP, Subtle and Blatant Prejudice scale; UMB-FAT, Universal Measure of Bias—fat version; UMB-GAY, Universal Measure of Bias—gay version; UMB-MUS, Universal Measure of Bias—Muslim version. * $P < 0.05$, ** $P < 0.01$. Adjacent correlations in bold type indicate scales within the same category of bias.

established scales known to assess bias were analyzed. The convergent validity of the three versions of the UMB was supported by their significant Pearson's product-moment correlations with each of the two other established measures of the same type of bias. These six correlations ranged from 0.50 to 0.81, as shown in Table 2. None of the three versions of the new scale were significantly correlated with socially desirable response styles (as measured by the MCSD). However, there were significant correlations between MCSD scores and responses on the ATOP and AFA scales, indicating a reduced expression of prejudice on these scales among participants who were more concerned about socially desirable self-presentation.

Different forms of prejudice were also significantly correlated with each other across targets, as shown in Table 2. Neither BMI nor educational level was significantly correlated with any measure of bias. However, sexual orientation was significantly correlated with gay bias (as measured by only the UMB-GAY scale). Kinsey scale responses indicating more predominant homosexuality were associated with lower bias ($r(145) = 0.17$, $P < 0.05$). Sexual orientation was not associated with any other form of bias. Similarly, participants self-identifying as gay or bisexual had lower scores than those self-identifying as heterosexual on the UMB-GAY, a difference that approached statistical significance ($t(143) = 1.81$, $P = 0.07$); no differences between sexual

orientation groups emerged on other UMB scales. However, neither overweight plus obese participants ($\text{BMI} \geq 25$) nor obese participants only ($\text{BMI} \geq 30$) differed from non-overweight participants on the UMB-FAT ($P = 0.69$ and 0.93 , respectively) or on any other UMB scale.

Replication across samples

To further confirm the psychometric properties of the UMB scale, the psychometric properties of the final UMB-FAT were examined separately and compared across the two independent New Zealand and US data collection sites.³³ First, Cronbach's α values for the 20-item scale were similar in both the New Zealand and US samples (0.85 and 0.88 , respectively), as were mean inter-item correlations (0.22 and 0.26 , respectively). When analyzed separately across the two samples, all item-total correlations in both samples were significant ($P < 0.01$) and were above 0.3 , except for one item in the New Zealand sample with an item-total correlation of 0.27 ('In general, fat people don't think about the needs of other people'). Confirmatory factor analysis yielding a four-factor solution showed that for each of the two separate samples items loaded onto the same factors as they did for the combined sample (Table 1). All factor loadings in both samples were at least 0.4 , except for one item in the New Zealand sample with a factor loading of 0.37 ('I find fat people to be sexy'). Finally, construct validity was similar for the two samples, with correlations between the UMB-FAT and the AFA of $r = 0.59$ and 0.62 for the New Zealand and US samples, respectively.

Comparing targets of bias

In the US sample in which all three targets of bias were examined, one-way repeated-measures analysis of variance compared the relative strength of bias against obese, gay and Muslim targets by comparing means of the UMB-FAT, UMB-GAY and UMB-MUS. A significant omnibus difference emerged ($F(259) = 9.23$, $P < 0.001$). Post-hoc examination of simple contrasts revealed that weight bias ($M = 3.07$) was significantly greater than bias against both other targets examined, gay ($M = 2.85$; $F(1,260) = 18.40$, $P < 0.001$) and Muslim ($M = 2.95$; $F(1,260) = 6.23$, $P < 0.01$). Muslim bias was also greater than gay bias ($F(1,260) = 4.22$, $P < 0.05$).

Discussion

The present study investigated the psychometric properties of a new UMB across different targets of prejudice. The internal consistency and construct validity of the UMB was established for three targets of bias: obesity, homosexuality and Muslim faith, each of which strongly converged with previous scales of these specific biases. None of the versions of the UMB was associated with socially desirable response styles. However, the prejudice expressed on the two existing

measures of antifat attitudes^{6,17} was significantly and inversely associated with socially desirable responding. This finding suggests that unlike existing measures of antifat attitudes, the UMB-FAT is less susceptible to response bias and thus is likely to be a more accurate measure of true attitudes. Consistent with past research in different populations using different measures of weight bias,³⁴ the present findings also demonstrated lower weight bias among Asian than among white participants, and greater bias among men than women. The good psychometric properties of the UMB scale suggest its utility in future research, where additional stigmatized groups may also be examined, and biases compared across other target groups.

It seems that although other civil rights movements have made significant progress at combating other biases such as racism, sexism and sexual discrimination,^{35,36} weight bias persists. Weight bias was significantly greater than two other targets of bias that are common in modern society, homosexuality and Muslim faith. These categories were chosen because they are widely known minority groups among the populations tested. Both are documented targets of discrimination.^{22,37} In the aftermath of September 11, 2001, the prejudice against Muslims has been shown to be particularly high.²² The strength of the bias against obese individuals is powerfully demonstrated by the fact that it significantly exceeded even the bias against Muslims. Obesity stigma may be the most robust bias because society tends to discriminate against individuals who are seen as responsible for their traits more than individuals who are seen as not responsible for their traits.⁶ Different measures of bias were also correlated across targets, suggesting the frequent co-occurrence and overlap of prejudice. Previous research has also shown a similarity between weight bias and racism.⁶ However, the generally lower effect sizes of the across-target correlations (relative to same-target correlations; Table 2) may also provide a form of discriminant validity in the construction of the new UMB scales.

Bias against all targets was uncorrelated with participant BMI, and overweight and obese participants did not have lower scores on the UMB-FAT. This lack of a reduction in weight bias in overweight and obese individuals has also been found elsewhere^{6,34,38} and suggests the absence of a preference, or in-group bias, among overweight individuals. In contrast, in-group bias was demonstrated for sexual orientation, as scores on the Kinsey scale indicating greater bisexuality or homosexuality were significantly associated with lower UMB-GAY scores. Individuals with higher BMIs often have as much weight bias as those with lower BMIs,^{6,34,38} unlike members of other minority groups who affiliate with and feel positively toward their group. Even though permanent weight loss is extremely rare,^{39,40} overweight individuals may often perceive themselves as being able to escape from the stigmatized group. The perceived option to leave the stigmatized group may prevent most overweight individuals from developing a bond with the group. Instead, they may continue to have biased beliefs

about other overweight people and to internalize weight bias by applying their negative beliefs specifically to themselves. Internalized weight bias is associated with psychopathology, including problems with mood, binge eating, body image and self-esteem.⁴¹

The present findings also suggest the degree to which weight bias is accepted in our society. Because it is not widely recognized as a form of prejudice, there is no taboo on weight-biased beliefs. Members of the out-group (in this case, non-overweight individuals) do not question their biased beliefs, and members of the in-group agree that these beliefs are fair, justified and internalize them as truths. If weight bias were recognized as a legitimate and important form of prejudice, then the out-group might be less likely to maintain the stereotype, as people do not wish to be identified as being prejudiced. Furthermore, as is historically the case when social injustices are recognized, the in-group might initiate a mainstream movement toward equality and begin to develop self-pride.

In contrast, group identity may greatly differ for sexual orientation, where gay and lesbian individuals often view their minority orientation status as permanent and come to affiliate with and accept it. In addition, the relatively lower societal bias against gay individuals than against obese people, indicated in the present study, may facilitate this process of acceptance. This affiliation and acceptance in part facilitates gay and lesbian persons 'coming out' and making their sexual orientation known to those around them. A likely result of this openness is that heterosexual persons who know or have close contact with openly homosexual persons show the lowest levels of sexual orientation-based biases.³⁶ And though most adults in the United States believe homosexuality to be wrong or unnatural, surveys and polls show that this majority has declined over the past several decades.³⁶

A limitation of the present study was its reliance on college student samples. Replication with broader samples is needed to allow for the generalization of findings. College samples may be relatively more aware of the unacceptability of bias, particularly against sexual orientation minority groups that have a presence in campus organizations. Another limitation was that information on participants' religious affiliation was not collected, and future studies could investigate how in-group bias among religious minorities compares with in-group bias in obese individuals. Finally, the present study did not assess test-retest reliability. This psychometric property should be assessed in future research, as it will be important to determine the stability in bias scores over time.

The measure developed in the present study fills an important gap by permitting the assessment of bias across targets. Future research is needed to compare other targets of discrimination with weight bias, such as racial and ethnic groups, and other health-related targets of stigma (for example, HIV/AIDS patients, underweight individuals). Studies that examine and compare biases against health issues that are generally considered a matter of personal

responsibility, such as smoking and obesity, to biases that are considered beyond the individual's control, may help to identify the role of control attributions in different forms of stigma. Such research may also discover commonalities between the nature of weight bias and other categories of stigmatized individuals. In addition, the measure developed in the present study can be used to compare the correlations between different biases and other constructs, such as disgust, moral values or religiosity, to help us better understand what factors maintain different forms of bias. The measure should also be compared with actual discriminatory behavior, as studies on the predictive validity of antifat attitude scales of biased attitudes are lacking, and investigations have even suggested no significant relationship between the AFA⁶ and behavioral discrimination.^{42,43} Investigations should also examine changes in different forms of bias using prospective and cross-sectional methods, to assess whether individuals may be less likely to express certain forms of prejudice over time or the course of development. The present findings strongly suggest that advocacy and research are needed to decrease the disproportionate expression and endorsement of weight bias in today's society. In the light of efforts and progress to protect other minority groups, it is unacceptable that obesity stigma is still so pervasive, strong and underrecognized.

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