

The Influence of One's Own Body Weight on Implicit and Explicit Anti-fat Bias

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Abstract

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Objective: This study examined the influence of one's own body weight on the strength of implicit and explicit anti-fat bias.

Research Methods and Procedure: Implicit and explicit anti-fat attitudes and obesity stereotypes were assessed among a large online sample ($N = 4283$) that included representation from across the weight spectrum (from underweight to extremely obese). Respondents also indicated their willingness to make a range of personal sacrifices in exchange for not being obese.

Results: All weight groups exhibited significant anti-fat bias, but there was an inverse relation between one's own weight and the level of observed bias. Thinner people were more likely to automatically associate negative attributes (bad, lazy) with fat people, to prefer thin people to fat people, and to explicitly rate fat people as lazier and less motivated than thin people. However, when the lazy stereotype was contrasted with another negative attribute (anxious), obese and non-obese people exhibited equally strong implicit stereotyping. Finally, a substantial proportion of respondents indicated a willingness to endure aversive life events to avoid being obese. For example, 46% of the total sample indicated that they would rather give up 1 year of life than be obese, and 30% reported that they would rather be divorced than be obese. In each case, thinner people were

more willing to sacrifice aspects of their health or life circumstances than were heavier people.

Discussion: Although the strength of weight bias decreased as respondents' body weight increased, a significant degree of anti-fat bias was still evident among even the most obese group of respondents, highlighting the pervasiveness of this bias.

Key words: stigma, weight bias, implicit attitudes, explicit attitudes, stereotypes

Introduction

There is evidence of stigmatization of obese people in multiple domains of living, including education, employment, and health care (1–4). Research documents widely held perceptions that obese people possess multiple negative characteristics, ranging from flaws in personal effort (such as lack of willpower or laziness) to flaws in central attributes of competence, attractiveness, and even morality (1). There is also evidence that the stigma of obesity is stronger today than it was 40 years ago (5).

Negative attitudes and stereotypes about obese people have been observed at both the explicit and implicit level (2–4,6–9). Explicit attitudes are those that people consciously acknowledge and are obtained using self-report measures. Because self-reports of attitudes are vulnerable to response bias, social desirability concerns, and other demand characteristics, researchers often assess implicit attitudes using performance-based measures, such as the Implicit Association Test (10). Implicit attitudes are thought to reflect evaluations that people are either unwilling or unable to report, either because of self-presentation concerns or because they are unaware of possessing the biases in the first place (11). At times, implicit attitudes even predict behavior (e.g., non-verbal, spontaneous behavior) better than do explicit attitudes (12). For example, one study found that implicit attitudes, but not explicit attitudes, predicted how far individuals chose to sit from an overweight person (13).

There is also some evidence suggesting that overweight and obese people hold anti-fat attitudes to the same extent as

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do normal-weight individuals (6–9). Therefore, anti-fat biases might be different from racial or ethnic biases in that there does not seem to be in-group favoritism, in which one's own group is perceived in a relatively positive light. One limitation of these studies, however, is that they generally have had a limited range of body weights represented, with either very few overweight/obese participants (7) or only overweight/obese participants (8,9).

The two aims of the present research were to examine the strength of implicit and explicit anti-fat attitudes across a wider weight range than has been examined in previous research and to test the limits of anti-fat attitudes. In the spirit of a recent paper titled, "I Would Rather Be a Size 10 Than Have Straight A's" (14), this second goal was accomplished by asking respondents to indicate what trade-offs they would be willing to make in a variety of personal and health domains rather than be obese.

Research Methods and Procedures

Respondents

Respondents were 4283 individuals who visited <http://www.weightbias.org>, a web site developed specifically for the purpose of this study, between March 2003 and February 2005. The web site was open to the general public and was advertised primarily through media coverage, academic lectures, web sites related to obesity, and word of mouth. There was an educational component of the web site that provided information about weight stigma, but this information was accessible only after respondents completed the study. Approximately 95% of respondents completed demographic information. Of those who completed demographic information, 83% were women, and 17% were men; 85% were white, 3% were Asian, 3% were black, 3% were Hispanic, 1% were Native American, and 5% were multiracial or other; mean age was 34.6 years (range, 13 to 79); 7% had a high school diploma or less, 62% had some college or a bachelor's degree, and 31% had an advanced degree; 79% were from the United States, 12% were from Britain, Canada, or Australia, and 9% were from other countries; mean BMI was 29 (range, 11 to 88); 3% were underweight (BMI < 18.5), 41% were normal weight (BMI, 18.5 to 24.9), 21% were overweight (BMI, 25.0 to 29.9), 21% were obese (BMI, 30.0 to 39.9), and 14% were extremely obese (BMI ≥ 40.0).

Materials and Procedure

Implicit Measures. Implicit attitudes and stereotypes were assessed using the Implicit Association Test (IAT)¹ (10). The IAT is a performance-based procedure that uses response latencies to assess the strength of association between a pair of concepts (e.g., flowers and insects) and a

pair of attributes (e.g., good and bad). There are two sets of critical trials: for one, respondents categorize items representing a concept (e.g., flowers) and an attribute (e.g., good) with a single response key, whereas items representing the other concept and attribute (insects and bad) are categorized with a different response key. In the second set of trials, the response key arrangement is reversed. Flowers and bad items are categorized with one response key, and insects and good items are categorized with the other response key. The difference in average response latencies for categorizing items between these two sets of trials provides an index of the strength of the association between the concepts and the attributes. In the example just described, most respondents would be faster to categorize items in the first condition than in the second condition, indicating stronger associations of flowers with good and insects with bad than the reverse.

In the present study, all respondents first completed an obesity attitude IAT, in which the concepts fat people (represented by the items fat, overweight, and large) and thin people (slim, thin, and skinny) were paired with the attributes good (wonderful, joyful, and excellent) and bad (terrible, nasty, and horrible). In line with previous research (2–4,8,9), we expected that respondents would associate fat people with bad and thin people with good more strongly than the reverse pairings. In the present study, the IAT is a comparison of fat people relative to thin people; therefore, the term anti-fat attitude indicates that fat people are more strongly associated with negative attributes than are thin people.

Respondents also completed one of two versions of an obesity stereotype IAT. The first version of the obesity stereotype IAT was similar to that used in previous research, pairing fat people and thin people with the attributes lazy (lazy, slow, and sluggish) and motivated (motivated, determined, and eager). In line with this previous research (2–4,9), we expected that respondents would more strongly associate fat people with lazy and thin people with motivated than the reverse pairings.

Although the lazy-motivated comparison correctly captures a critical stereotype about obese individuals, it also has a strong valence component. The term lazy is negatively valenced, whereas the term motivated is positively valenced. As a consequence, it is possible that people would implicitly associate the term lazy with fat people, not because of the term's semantic meaning, but because its negative valence matches their generally negative attitude toward fat people. Our interest was in determining whether there were stereotypic associations with fat people that were independent of the evaluative associations. Accordingly, we included an alternative version of the stereotype IAT that assessed the stereotypic attribute lazy compared with a similarly valenced but non-stereotypic attribute (anxious; anxious, tense, nervous). Together, these two IATs were

¹ Nonstandard abbreviation: IAT, Implicit Association Test.

Table 1. Implicit attitudes and stereotypes as a function of BMI category

	BMI category					Omnibus <i>F</i>	<i>df</i>	<i>p</i>
	Underweight	Normal weight	Overweight	Obese	Extremely obese			
Fat + bad/								
thin + good	<i>n</i> = 95	<i>n</i> = 1518	<i>n</i> = 775	<i>n</i> = 757	<i>n</i> = 493			
IAT <i>D</i> score (SD)	0.69 ^a (0.45)	0.60 ^a (0.42)	0.50 ^b (0.47)	0.36 ^c (0.48)	0.24 ^d (0.53)	77.24	4, 3633	<0.001
Cohen's <i>d</i>	1.53	1.43	1.06	0.75	0.45			
Fat + lazy/								
thin + motivated	<i>n</i> = 42	<i>n</i> = 497	<i>n</i> = 240	<i>n</i> = 248	<i>n</i> = 178			
IAT <i>D</i> score (SD)	0.34 ^a (0.42)	0.31 ^a (0.40)	0.17 ^b (0.39)	0.07 ^{b,c} (0.44)	0.04 ^c (0.43)	22.78	4, 1200	<0.001
Cohen's <i>d</i>	0.81	0.78	0.44	0.16	0.09			
Fat + lazy/								
thin + anxious	<i>n</i> = 31	<i>n</i> = 479	<i>n</i> = 259	<i>n</i> = 250	<i>n</i> = 150			
IAT <i>D</i> score (SD)	0.38 ^a (0.40)	0.25 ^a (0.39)	0.27 ^a (0.41)	0.21 ^a (0.38)	0.21 ^a (0.42)	2.08	4, 1164	0.08
Cohen's <i>d</i>	0.95	0.64	0.66	0.55	0.50			

For each IAT, positive *D* scores reflect a stronger association of bad or lazy with fat people compared to thin people. Means in a row with different superscripts are significantly different at *p* < 0.05. IAT, Implicit Association Test; SD, standard deviation.

designed to reveal whether lazy stereotypes about obese people are purely evaluative (i.e., whether obese people are generally associated with negative attributes) or whether they are specifically associated with the quality of laziness.

Explicit Measures. There were three items assessing respondents' explicit attitudes and stereotypes about fat people and thin people, each of which was rated on a five-point scale. These items were the same ones used in previous research on weight bias (2–4). For the attitude measure, the scale ranged from “I strongly prefer thin people to fat people” (+2) to “I strongly prefer fat people to thin people” (–2). The scales for the two stereotype measures were anchored as follows: “I strongly believe that thin people are more motivated than fat people” (+2) to “I strongly believe that fat people are more motivated than thin people” (–2) and “I strongly believe that thin people are lazier than fat people” (+2) to “I strongly believe that fat people are lazier than thin people” (–2; reverse coded).

Trade-off Measures. Individuals responded to six items related to personal trade-offs that they would make to avoid being obese (e.g., “I would rather be an alcoholic than be obese”; see Table 3 for a complete list). Respondents also completed four items related to trade-offs concerning their children (e.g., “I would rather have an anorexic child than an obese child”; see Table 4 for a complete list). These items were developed for the present study. Each of these items was rated on a four-point scale (1, strongly disagree;

4, strongly agree). Respondents also indicated how many years of life they would be willing to give up rather than be obese. To minimize the burden to respondents, each individual responded to only 5 of these 11 items, selected at random.

Potential Moderators. Participants also responded to four additional measures, which were examined as potential moderators. These included: “How many of your relatives are overweight?” (response options: none, one, some, many, all); “How many of your friends are overweight?” (none, one, some, many, all); “How do you feel about your own weight?” (very satisfied, satisfied, dissatisfied, very dissatisfied); and “How well do you feel you understand what it is like to be obese?” (not at all, a little bit, quite well, extremely well).

Results

Implicit Attitudes and Stereotypes

The IAT was scored according to the revised scoring algorithm described by Greenwald et al. (15), which produces a *D* score. In the present study, positive *D* scores indicate stronger associations of negative attributes with fat people compared with thin people, whereas a *D* score of 0 indicates no difference in associations with fat people compared with thin people. As predicted, on the obesity attitude IAT, individuals more strongly associated fat people with

Table 2. Explicit attitudes and stereotypes as a function of BMI category

	BMI category					Omnibus <i>F</i>	<i>df</i>	<i>p</i>
	Underweight	Normal weight	Overweight	Obese	Extremely obese			
Prefer thin people	<i>n</i> = 119	<i>n</i> = 1660	<i>n</i> = 877	<i>n</i> = 867	<i>n</i> = 567			
Mean (SD)	0.94 ^a (0.82)	0.73 ^b (0.67)	0.54 ^c (0.72)	0.25 ^d (0.78)	0.07 ^e (0.80)	127.65	4, 4085	<0.001
Cohen's <i>d</i>	1.15	1.09	0.75	0.32	0.09			
Preferring thin people (%)	70.6	65.4	52.9	36.7	28.2			
Thin people more motivated	<i>n</i> = 110	<i>n</i> = 1535	<i>n</i> = 802	<i>n</i> = 798	<i>n</i> = 535			
Mean (SD)	0.59 ^a (0.67)	0.36 ^b (0.69)	0.30 ^b (0.66)	0.17 ^c (0.71)	0.10 ^c (0.77)	25.17	4, 3775	<0.001
Cohen's <i>d</i>	0.90	0.54	0.45	0.24	0.13			
% who agree	52.7	37.7	34.3	26.9	24.5			
Fat people lazier	<i>n</i> = 110	<i>n</i> = 1518	<i>n</i> = 804	<i>n</i> = 795	<i>n</i> = 534			
Mean (SD)	0.43 ^a (0.78)	0.31 ^a (0.68)	0.23 ^b (0.70)	0.17 ^{b,c} (0.69)	0.10 ^c (0.69)	13.40	4, 3756	<0.001
Cohen's <i>d</i>	0.54	0.45	0.33	0.25	0.14			
% who agree	42.7	35.3	29.8	26.5	22.6			

Means in a row with different superscripts are significantly different at $p < 0.05$. SD, standard deviation.

bad and thin people with good. The mean IAT *D* score was 0.48 (SD = 0.48), Cohen's $d = 1.00$. There was an effect of BMI category on implicit attitudes, such that the magnitude of the anti-fat attitude was smaller among individuals with higher BMIs (see Table 1). Consistent with previous research (8,9), however, implicit anti-fat attitudes were moderately strong even among extremely obese respondents (Cohen's $d = 0.45$).

On the standard stereotype IAT, respondents moderately associated fat people with lazy and thin people with motivated. The mean IAT *D* score was 0.19 (SD = 0.42), Cohen's $d = 0.44$. There was also a main effect of BMI category, indicating that the magnitude of the stereotypic association was smaller among individuals with higher BMIs (see Table 1). In contrast with previous research (9), the implicit obesity stereotype was weak among obese respondents (Cohen's $d = 0.16$) and extremely obese respondents (Cohen's $d = 0.09$), although it was not reversed.

The magnitude and direction of the IAT *D* score for the alternate stereotype IAT were similar to those for the standard stereotype IAT (mean IAT *D* score = 0.24, SD = 0.39, Cohen's $d = 0.60$), indicating that respondents associated lazy with fat people more than with thin people, even when lazy was contrasted with another negative attribute (anxious). Interestingly, there was no effect of BMI category; that is, when isolating the stereotypic content from valence,

obese and non-obese respondents demonstrated similar levels of stereotyping (see Table 1). The correlation between the attitude IAT and the stereotype IAT was much stronger for the standard (valenced) stereotype IAT ($r = 0.47$) than for the alternate stereotype IAT ($r = 0.11$), $z = 9.61$, $p < 0.001$.

For each of the IATs, the pattern of results remained unchanged when controlling for gender, age, nationality, ethnicity, level of education, number of overweight friends, number of overweight relatives, perceived understanding of what it is like to be obese, and personal weight satisfaction.

Explicit Attitude and Stereotypes

Table 2 shows the means for the explicit attitude and stereotype measures, separated by BMI category. The reported effect sizes (Cohen's d) reflect comparisons with a neutral score of 0. Overall, people moderately preferred thin people to fat people (mean = 0.50, SD = 0.78, Cohen's $d = 0.64$), believed that fat people are lazier than thin people (mean = 0.24, SD = 0.70, Cohen's $d = 0.34$), and believed that thin people are more motivated than fat people (mean = 0.27, SD = 0.70, Cohen's $d = 0.38$). In each case, there was a significant effect of BMI category, indicating that the magnitude of the bias was lower among heavier individuals than among leaner individuals. Overall, obese and extremely obese respondents showed low levels of explicit

anti-fat attitudes and stereotypes, which contrasts with the moderate level of implicit anti-fat bias noted above. The overall pattern of results did not change when controlling for gender, age, nationality, ethnicity, level of education, number of overweight friends, number of overweight relatives, perceived understanding of what it is like to be obese, and personal weight satisfaction.

Personal Trade-offs

Although the mean ratings of agreement for the personal trade-off items were quite low overall, there were a number of striking findings that emerged when we examined the proportion of respondents who agreed with each statement (i.e., those who selected a 3 or a 4). Forty-six percent of respondents reported that they would be willing to give up at least 1 year of life rather than be obese, and 15% reported that they would be willing to give up 10 years or more of their life. In addition, 30% of respondents reported that they would rather be divorced than obese, 25% reported that they would rather be unable to have children than be obese, 15% reported that they would rather be severely depressed, and 14% reported that they would rather be alcoholic. For each trade-off, there was a significant effect of BMI category, such that leaner respondents were much more likely to endorse these statements than were heavier respondents (see Table 3). There are some sacrifices that people generally seem to be unwilling to make: overall, only 5% of respondents reported that they would rather lose a limb than be obese, and only 4% of respondents reported that they would rather be blind than be obese.

Child-Related Trade-offs

The overall ratings for child-related trade-off items were considerably lower than those for personal-trade-off items, as were the percentages of respondents who agreed with each statement. Still, 10% of respondents overall reported that they would rather have an anorexic child than an obese child, and 8% reported that they would rather have a learning-disabled child than an obese child. Again, there was a significant effect of BMI category, such that lean respondents were much more likely to agree with these trade-off statements than were heavier respondents (see Table 4).

Discussion

The present study examined the strength and limits of anti-fat bias among a large community-based online sample that represented a wide range of body weights. We found evidence for the widespread nature of both implicit and explicit anti-fat attitudes and obesity stereotypes. In addition, although previous research has suggested that weight does not show the in-group favoritism bias seen in other groups (8,9), we did find that the magnitude of anti-fat biases was significantly weaker among people with high

BMIs compared with those with low BMIs. The present study may have detected this previously unobserved effect because of the large sample that included significant numbers of obese participants. It is important to note, however, that our results also revealed the persistence of implicit anti-fat biases and that there was no evidence of a pro-fat bias among obese respondents. Even the most obese group of respondents in this study showed an implicit preference for thin people relative to fat people and implicit stereotyping of fat people as lazy compared with thin people.

To our knowledge, the present study was also the first to assess whether the implicit obesity stereotypes reported in previous research using the IAT were an artifact of the opposite valence of the comparison words (i.e., lazy vs. motivated). Our findings indicate that the word fat was associated with lazy, whether the comparison adjective had a positive valence (i.e., motivated) or a negative valence (i.e., anxious). Notably, when comparing laziness with another negative attribute (anxious), obese people showed a level of implicit stereotyping that was similar to that of thin people. Taken with the results of the attitude IAT, this intriguing finding suggests that group membership might influence liking for the group, but not necessarily stereotypes or beliefs about the group.

We also examined the limits of anti-fat attitudes by asking individuals to indicate what they would be willing to trade off rather than be obese. Although the overall level of agreement was quite low for some of the trade-off items (e.g., rather lose a limb than be obese), there were other items for which agreement was surprisingly high (e.g., rather be divorced). Consistent with the findings for implicit and explicit attitudes and stereotypes, lean respondents were much more likely than were heavier respondents to agree with the various trade-off items. This raises an important question: Why do a large proportion of lean people indicate that they would rather be divorced, severely depressed, unable to have children, or live shorter lives than be obese, whereas overweight people do not? Given the intense stigma of obesity and the various health conditions that are associated with excess weight, one might expect that heavier individuals would be particularly willing to make other sacrifices to not have the burden of being obese. However, perhaps overweight and obese individuals, having already experienced the consequences of excess weight, are better able to consider the types of hypothetical trade-off scenarios that were posed in the present study. Future research is needed to better understand this difference.

There are some caveats about the present study that are worth noting. First, because of the method of data collection, the sample was not randomly selected, is diverse on a number of critical dimensions, and is not representative of any definable population. Second, our sample might be biased toward obese people who are more self-accepting or who actively oppose the existent anti-fat biases in our

Table 3. Personal trade-off items as a function of BMI category

	BMI category					Omnibus <i>F</i>	<i>df</i>	<i>p</i>
	Underweight	Normal weight	Overweight	Obese	Extremely obese			
Give up <i>x</i> years	<i>n</i> = 57	<i>n</i> = 695	<i>n</i> = 377	<i>n</i> = 354	<i>n</i> = 248			
Mean (SD)	8.93 ^a (13.14)	4.81 ^b (8.93)	2.75 ^c (5.02)	2.23 ^c (5.37)	2.45 ^c (5.16)			
1 year+ (%)	71.9	57.4	41.6	30.5	34.3	18.37	4, 1726	<0.001
10 years+ (%)	33.4	18.2	13.3	10.0	10.9			
Be divorced	<i>n</i> = 52	<i>n</i> = 684	<i>n</i> = 361	<i>n</i> = 388	<i>n</i> = 238			
Mean (SD)	2.63 ^a (1.03)	2.16 ^b (0.98)	1.94 ^c (0.98)	1.81 ^c (0.93)	1.82 ^c (0.99)	16.31	4, 1718	<0.001
% who agree	65.4	35.7	27.4	20.1	23.9			
Be unable to have children	<i>n</i> = 51	<i>n</i> = 692	<i>n</i> = 365	<i>n</i> = 373	<i>n</i> = 246			
Mean (SD)	2.39 ^a (1.10)	1.93 ^b (1.00)	1.81 ^b (0.97)	1.83 ^b (0.97)	1.80 ^b (1.04)	4.93	4, 1722	=0.001
% who agree	47.1	27.0	23.6	22.8	22.8			
Be severely depressed	<i>n</i> = 44	<i>n</i> = 678	<i>n</i> = 383	<i>n</i> = 365	<i>n</i> = 271			
Mean (SD)	2.55 ^a (1.02)	1.85 ^b (0.89)	1.60 ^c (0.73)	1.52 ^c (0.75)	1.51 ^c (0.80)	27.48	4, 1736	<0.001
% who agree	52.3	20.8	8.1	9.3	10.7			
Be alcoholic	<i>n</i> = 56	<i>n</i> = 690	<i>n</i> = 345	<i>n</i> = 358	<i>n</i> = 244			
Mean (SD)	2.30 ^a (0.99)	1.81 ^b (0.86)	1.56 ^c (0.78)	1.37 ^d (0.60)	1.36 ^d (0.64)	37.63	4, 1688	<0.001
% who agree	42.9	19.8	12.5	5.6	6.1			
Lose a limb	<i>n</i> = 58	<i>n</i> = 695	<i>n</i> = 382	<i>n</i> = 355	<i>n</i> = 233			
Mean (SD)	1.81 ^a (0.91)	1.47 ^b (0.66)	1.36 ^c (0.58)	1.27 ^c (0.53)	1.31 ^c (0.56)	14.63	4, 1718	<0.001
% who agree	22.4	7.0	3.9	2.2	3.0			
Be blind	<i>n</i> = 49	<i>n</i> = 719	<i>n</i> = 374	<i>n</i> = 376	<i>n</i> = 249			
Mean (SD)	1.63 ^a (0.86)	1.38 ^b (0.62)	1.28 ^{b,c} (0.53)	1.22 ^c (0.46)	1.23 ^c (0.53)	10.42	4, 1762	<0.001
% who agree	16.3	5.0	3.2	2.1	3.6			

Means in a row with different superscripts are significantly different at *p* < 0.05. SD, standard deviation.

society. Indeed, many of the respondents in the present study would have found the link to the study web site by visiting the web site for the Rudd Institute (an organization whose mission is to address stigmatization and discrimination of obese individuals), attending a presentation on weight stigma given by one of the authors, or reading a news article on stigma that made reference to the web site. Given these sampling influences, the anti-fat biases observed in the present sample are all the more remarkable and probably underestimate the extent to which biases may be observed in the rest of the general population. Furthermore,

Allison et al. (6) found anti-fat attitudes even among a group of members of the National Association to Advance Fat Acceptance, whom the authors described as “mostly obese persons who are actively concerned with problems faced by obese persons.”

A potential limitation of using web site data is that individuals were not prevented from participating more than once. Multiple responses from single individuals can threaten sample independence. This issue was not of significant concern for the current study because the sample was large enough (*N* = 4283) that even the most ambitious

Table 4. Child-related trade-off items as a function of BMI category

	BMI category					Omnibus <i>F</i>	<i>df</i>	<i>p</i>
	Underweight	Normal weight	Overweight	Obese	Extremely obese			
An anorexic child	<i>n</i> = 45	<i>n</i> = 685	<i>n</i> = 350	<i>n</i> = 367	<i>n</i> = 249			
Mean (SD)	2.20 ^a (0.97)	1.73 ^b (0.72)	1.57 ^c (0.67)	1.46 ^{c,d} (0.64)	1.39 ^d (0.56)	24.88	4, 1691	<0.001
% who agree	35.5	13.7	6.8	6.5	3.6			
A learning-disabled child	<i>n</i> = 41	<i>n</i> = 751	<i>n</i> = 367	<i>n</i> = 377	<i>n</i> = 232			
Mean (SD)	1.73 ^a (0.74)	1.58 ^a (0.72)	1.45 ^b (0.64)	1.40 ^b (0.62)	1.36 ^b (0.60)	8.75	4, 1763	<0.001
% who agree	12.2	10.9	6.5	6.4	3.9			
A drug-addicted child	<i>n</i> = 44	<i>n</i> = 699	<i>n</i> = 399	<i>n</i> = 379	<i>n</i> = 246			
Mean (SD)	1.80 ^a (0.85)	1.42 ^b (0.63)	1.29 ^c (0.54)	1.26 ^c (0.52)	1.20 ^c (0.51)	16.17	4, 1762	<0.001
% who agree	18.1	5.2	2.6	3.2	2.4			
A blind child	<i>n</i> = 52	<i>n</i> = 698	<i>n</i> = 356	<i>n</i> = 382	<i>n</i> = 217			
Mean (SD)	1.63 ^a (0.74)	1.40 ^b (0.60)	1.28 ^c (0.50)	1.26 ^c (0.51)	1.22 ^c (0.49)	11.63	4, 1700	<0.001
% who agree	11.5	4.9	2.5	2.1	2.3			

Means in a row with different superscripts are significantly different at *p* < 0.05. SD, standard deviation.

multiple respondent could not provide an appreciable amount of data to affect the observed outcomes. Furthermore, direct tests of multiple responses on similar data sets have revealed little influence on results (16).

There are several areas of future research that could build on the present study. We found evidence of a decrease in anti-fat attitudes among heavier individuals. One question that follows is whether those who hold less extreme anti-fat attitudes might have some protection against the negative psychological consequences of the stigma of obesity. A recent study by Friedman et al. (17) reported that anti-fat attitudes moderated the relation between stigma experiences and negative body image. In addition, Vartanian et al. (18) found that the internalization of social standards regarding thinness and fatness is related to explicit anti-fat attitudes. Future research should further examine the role of anti-fat attitudes and the internalization of social standards in the psychological effects of obesity.

Another related question is whether experiencing weight bias affects obese individuals' motivation to engage in weight-control efforts. It has been theorized that the relationship between body dissatisfaction and weight-control efforts is curvilinear in nature, suggesting that some degree of body dissatisfaction might actually motivate individuals to improve their eating and exercise behaviors (19). If experiencing weight bias increases body dissatisfaction, then the implication is that some degree of stigmatizing

experiences might serve as motivators for making behavior changes that lead to weight loss. To date, however, research with adolescents suggests that the experience of being teased is linked to a greater likelihood of engaging in eating-disordered behaviors (i.e., diet pills, skipping meals, laxatives, and binge eating) (20) and is also linked to a lower likelihood of engaging in physical activity at school (21). These findings indicate that experiencing weight bias might instead lead to feelings of desperation, shame, and withdrawal, which, in turn, would decrease individuals' ability to make healthy changes in eating and exercise. Clearly, further research on the impact of weight bias on people's motivation to make weight-loss attempts is needed.

Taking our findings with those of previous studies, weight bias (measured implicitly or explicitly) is powerful, affects perceptions of both the behavior and character of obese people, and can influence people's behavior toward obese individuals. Importantly, weight bias occurs in all segments of the population, even among obese persons themselves. Given that bias undermines key social values of fairness and equity, more active steps must be taken to reduce bias based on weight.

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