Explicit Weight Stereotypes Are Curvilinear: Biased Judgments on Thin and Overweight Targets

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Abstract
Bias against overweight people is documented; however, little attention has been directed to bias against thin people. Theoretically, light and heavy bodies can invoke an affective mechanism leading to bias and avoidance of those different physically from the average. Participants (N = 62) rated six same or opposite sex targets varying randomly in weight. Ratings of traits and liking were curvilinear as a function of weight and showed bias against light and heavy targets. For heavy targets, negative affect predicted discriminatory behavioural intentions; stereotypes did not. Copyright © 2011 John Wiley & Sons, Ltd and Eating Disorders Association.

Keywords
weight bias; social perception

Method
Participants
Undergraduate volunteers from a public university in New England (32 women and 30 men) participated, and there were no exclusion criteria. Ages ranged from 18 to 49 (mean 27.2 years). Participants were told that the study focused on how personality is evaluated based on limited information and was conducted in the Intergroup Relations Laboratory at Rhode Island College. The research was approved by the Institutional Review Board.

Stimulus targets
Lifelike, virtual people (i.e. targets) were generated using the My Virtual Model Inc. website (http://www.mvm.com/cs/). Weight was a random variable rather than a fixed variable. When levels of the IV are selected randomly from a population of levels, inferences may legitimately be made to all levels in the population and not simply to those included in the experiment. First, the target height was specified at the average for American men and women reported by the National Center for Health Statistics in 2003 (5’9 1/2” and 5’4”, respectively). Then, six weights were selected randomly from the range of 100 [body mass index (BMI) of 14.6 for men and 17.2 for women] to 300 lbs (BMI of 43.7 for men and 51.6 for women).
weights selected randomly were 123, 145, 196, 203, 245 and 282 lbs. The BMIs for male targets were 17.9, 21.1, 28.5, 29.5, 35.7 and 41.0 and for female targets were 21.1, 24.9, 33.6, 34.8, 42.0 and 48.4, respectively at the six weight levels. Variances and means on BMI scores for male and female targets were equal ($F_{5,5} = 0.13, p = .72$ and $t_{10} = 0.95, p = .37$, respectively). Male and female targets had identical facial features. All male targets were dressed in black plants and a white tee shirt but had different hair styles so that they would not appear identical. All female targets were dressed in a black skirt with a white tank top, and their hairstyles varied as well. To control hairstyles, a Latin square was constructed so that targets at all weights were presented with each of six hairstyles for different blocks of perceivers.

### Procedures, measures and research design

While seated at the computer, a participant would see a target on the screen and was then asked to make personality and attitudinal ratings. The order in which the weights were presented was random for every participant. Personality ratings were based on the Big Five Factors (John, 1990). Each of the five factors was indicated by two 10-point (1–10) bipolar rating scales with that were bounded at each extreme by adjectives. For Factor 1 (extraversion), the adjectives were introverted–extroverted and unsociable–sociable; for Factor 2 (agreeableness), the adjectives were argumentative–good natured and uncooperative–cooperative; for Factor 3 (conscientiousness), the adjectives were unmotivated–motivated and unambitious–ambitious; for Factor 4 (emotional stability), the adjectives were insecure–secure and nervous–at ease; and for Factor 5 (intelligence), the adjectives were uncultured–cultured and unintelligent–intelligent.

The participants also responded to additional attitude measures focused only on people who are overweight (Crandall, 1994; Morrison & O’Connor, 1999) by using a 10-point scale (1, strongly disagree, to 10, strongly agree). The measures were the following: I am disgusted by an overweight person in a bathing suit at the beach, I really do not like overweight people, I feel uncomfortable around overweight people, the overweight have only themselves to blame, the overweight are not as bright as thin people, it is hard to take the overweight seriously, I might avoid hiring overweight people, I would never date an overweight person, and I do not have many overweight friends. Targets liking was rated on two 4-point scales (‘like’ and ‘like to know’).

The participants were assigned randomly to judge six male or female targets (one at each of the six weight levels). The design was 2 (gender of judge) × 2 (gender of target) × 6 (weight levels); the gender factors were between the subjects, and the random weight factor was within the subjects. Trait factors (1–5) and their two indicators were repeated factors within targets. Repeated measure ANOVA was used to analyze the rating data.

### Results

A significant effect of target weight on personality judgments was observed with $F_{5,54} = 10.55, p < .05$; the mean judgments were 5.95, 6.53, 6.26, 6.52, 5.71 and 5.62 and were best fit by a curvilinear function ($F_{1,58} = 19.29, p < .001$). Targets with the lightest and heaviest weights were judged more negatively on traits than targets in the middle of the distribution. Perceiver weight was unrelated to ratings of the targets ($F_{1,57} = 0.06, p = .80$). Mean like ($F_{1,58} = 10.89, p = .002$) and like-to-know ratings were best fit by curvilinear functions (2.07, 2.38, 2.21, 2.24, 2.05 and 1.88 with $F_{5,54} = 3.11, p = .02$, and 2.07, 2.34, 2.10, 2.29, 1.86 and 1.74 with $F_{5,54} = 5.14, p = .001$, respectively).

A three-way interaction involving gender of the judge, gender of the target and target weights was observed with $F_{5,54} = 2.97, p = .02$. Judgments by male and female perceivers of same and opposite sex targets of varying weights were then analyzed separately. Men’s judgments on the female targets failed to show a

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**Figure 1** (a) Men at 123 and 282 lbs and (b) Women at 123 and 282 lbs

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weight effect with $F_{5,70} = 1.17, p = .33$. Mean judgments were 5.84, 6.39, 5.77, 6.35, 5.88 and 5.84, respectively. Men’s judgments on the male targets’ traits did vary significantly with $F_{5,70} = 3.31, p = .01$. Mean judgments were 6.00, 6.27, 6.43, 6.87, 5.53 and 5.68 and were best fit by a curvilinear function ($F_{1,14} = 5.35, p = .04$). Men’s trait judgments were more negative for the lightest and heaviest male targets. Women’s judgments on the female targets showed a significant weight effect with $F_{5,75} = 2.85, p = .02$; the mean judgments were 6.14, 7.12, 6.47, 6.34, 6.11 and 5.98, respectively, and were best fit by a curvilinear function ($F_{1,15} = 6.70, p = .02$). Women’s judgments on the male targets showed a significant effect of target weight with $F_{5,75} = 6.73, p < .001$, and mean judgments were 5.83, 6.33, 6.38, 6.49, 5.32 and 4.98, respectively. A curvilinear function fit these mean judgments with $F_{1,15} = 16.83, p = .001$. The women ascribed negative personality traits to the lightest and heaviest male and female targets. These results supported Hypothesis 2.

We measured affect toward people who are overweight (I am disgusted by an overweight person in a bathing suit, I do not like people who are overweight, and I feel uncomfortable around overweight people with $\alpha = .66$), cognitions about people who are overweight (the overweight have only themselves to blame, the overweight are not as bright as thin people, and it is hard to take the overweight seriously with $\alpha = .63$) and behavioural intentions (I might avoid hiring overweight people, I would never date an overweight person, and I do not have many overweight friends with $\alpha = .66$). Affect, cognition and behavioural intention constructs were formed by averaging these variables, and the parameters of Figure 2 were estimated using AMOS-17. Perceivers’ affective and cognitive responses to people who are overweight were correlated significantly ($r = .68, p < .05$). However, only affect toward people who are overweight predicted behavioural intentions to avoid members of this group; the standardized regression coefficient $\beta$ was .66 ($p < .05$). Cognition toward people who are overweight was independent of behavioural intentions; the standardized regression coefficient $\beta$ was .15 ($p > .05$). These results offered partial support for Hypothesis 3.

### Discussion

Bias against people who are overweight is well documented (Puhl & Heuer, 2009), yet very little attention has been paid to bias against thin people. This experiment demonstrated that weight bias was not limited to the heaviest targets; rather, weight bias was curvilinear. Because target weight was a random variable, the curvilinear function generalizes to all weights in the underweight to obese range.

Why does light and heavy weight elicit bias? Animals, including humans, have evolved brain mechanisms to avoid disease-causing pathogens, and anomalies of the body, such as being overweight (Park et al., 2007), may activate a mechanism that results in stigmatization and avoidance (Kurzban & Leary, 2001). A thin body frame, though not necessarily skeletally thin, may also activate this mechanism. Because there does not appear to be a social norm legitimizing stereotyping of thin people, socialization theory cannot explain curvilinear weight bias.

Women displayed curvilinear weight bias when responding to male and female targets. Men showed curvilinear weight bias when judging thin and heavy male targets but were unbiased when judging women. This was unexpected, and we offer three possible explanations. First, men may not be biased against light or heavy women. Second, this may be a type II error. The literature reviewed and the statistical power of this experiment argue against these explanations. Third, men may have suppressed explicit bias, and this is the most plausible explanation. Additional research is warranted to test the hypothesis that in an explicit judgment task, men suppress bias against women.

The path analysis showed that the negative affective and cognitive responses were correlated but only affect predicted discriminatory behavioural intentions. Cognitions did not. This finding is consistent with meta-analytic results (Talaska, Fiske, & Chaiken, 2008) showing that affect was a much better predictor of discrimination against a group than cognition.

Stigmatization challenges those overcoming an eating disorder. Clinically underweight and overweight individuals should understand the social and biological origins of weight stigma that affect others’ responses to them. Information campaigns aimed at the general public documenting weight bias and the adverse impact on those striving to recover from an eating disorder is also warranted.

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### Conflict of Interest

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Thin and Overweight Stereotypes


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