Impact of Perceived Consensus on Stereotypes About Obese People: A New Approach for Reducing Bias.

Article *in* Health Psychology · October 2005

DOI: 10.1037/0278-6133.24.5.517 · Source: PubMed

3 authors:

Rebecca M Puhl
University of Connecticut

Marlene Schwartz
University of Connecticut

Kelly D Brownell
Yale University

Health Psychology
2005, Vol. 24, No. 5, 517–525

0278-6133/05/$12.00 DOI: 10.1037/0278-6133.24.5.517

Impact of Perceived Consensus on Stereotypes About Obese People: A New Approach for Reducing Bias

Rebecca M. Puhl, Marlene B. Schwartz, and Kelly D. Brownell
Yale University

In 3 experiments, the authors tested the effect of perceived social consensus on attitudes toward obese people. Participants completed self-report measures of attitudes toward obese people prior to and after manipulated consensus feedback depicting attitudes of others. In Study 1 (N = 60), participants decreased negative and increased positive stereotypes after learning that others held more favorable attitudes toward obese people. In Study 2 (N = 55), participants improved attitudes when they learned about favorable attitudes of obese people from an in-group versus an out-group source. In Study 3 (N = 200), a consensus approach was compared with other stigma reduction methods. Social consensus feedback influenced participants' attitudes and beliefs about causes of obesity. Providing information about the uncontrollable causes of obesity and supposed scientific prevalence of traits also improved attitudes.

Keywords: obesity, bias, stigma, attitude, stereotype

Obese people experience widespread discrimination and stigma (Puhl & Brownell, 2001). Weight bias has been exhibited by physicians, psychologists, nurses, and medical students (Davis-Coelho, Waltz, & Davis-Coelho, 2000; Maddox & Liederman, 1969; Maroney & Golub, 1992; Price, Desmond, Krol, Snyder, & O'Connell, 1987; Teachman & Brownell, 2001; Wiese, Wilson, Jones, & Neises, 1992). Even health care professionals specializing in obesity are not immune to weight bias (Schwartz, Chambliss, Brownell, Blair, & Billington, 2003).

Antifat attitudes may have important effects. Studies have documented reluctance among obese patients to seek preventive health care services owing to embarrassment about weight (Fontaine, Faith, Allison, & Cheskin, 1998), perhaps resulting from feeling criticized by their physicians (Olson, Schumaker, & Yawn, 1994). Data suggest obese patients receive less appointment time and more negative reactions from physicians (Hebl & Xu, 2001), and physicians report intervening less often with obese patients than they believe they should (Kristeller & Hoerr, 1997). Obesity is associated with increased likelihood of depression, social isolation, suicidal thoughts, and suicide attempts (Carpenter, Hasin, Allison, & Faith, 2000; Strauss & Pollack, 2003). Among adolescents, weight-based teasing is related to increased depressive symptoms and suicide attempts (Eisenberg, Neumark-Sztainer, & Story, 2003). Experiencing stigma may directly impact health, as suggested by a study that found that women who experienced racial stigma exhibited greater negative cardiovascular health indices (e.g., diastolic blood pressure) (Guyll, Matthews, & Bromberger, 2001).

The etiology of weight bias and ways to ameliorate this stigma are poorly understood (Crandall & Schiffhauer, 1998; Puhl & Brownell, 2003). Despite evidence that body weight is determined by a complex interaction of biological and environmental factors, obese people are blamed for being overweight (Crandall, 1994; Crandall & Cohen, 1994; Crandall & Martinez, 1996). Antifat attitudes are fueled by attributions of controllability of weight, North American values of self-determination and individualism, and the belief that people get what they deserve and are responsible for their life situation (Crandall, 1994; Crandall et al., 2001; Crandall & Martinez, 1996; Crandall & Schiffhauer, 1998; Weiner, Perry, & Magnusson, 1988).

Research on bias reduction has demonstrated mixed findings. Several studies have attempted to change attributions of controllability of body weight with education about biological, genetic, and noncontrollable etiological factors for obesity. In one study, this strategy effectively changed attitudes (Crandall, 1994), whereas in other studies it did not (Bell & Morgan, 2000; Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003).

Evoking empathy toward obese people has been generally unsuccessful in changing negative attitudes (Gapinski, Schwartz, & Brownell, 2003; Teachman et al., 2003). For example, negative attitudes of medical students toward obese people did not change following direct interpersonal contact with obese patients after an 8-week rotation (Blumberg & Mellis, 1980). In contrast, Wiese and colleagues (1992) reduced negative attitudes in medical students with a combination of videos of obese people, role-play exercises, and written materials discussing genetic and environmental causes of obesity (Wiese et al., 1992).

Rebecca M. Puhl, Marlene B. Schwartz, and Kelly D. Brownell, Department of Psychology, Yale University.

This research was supported in part by the Rudd Institute and the Social Sciences and Humanities Research Council of Canada. We thank Geoff Cohen, Robert Kerns, and Peter Salovey for their insightful comments and guidance on this research. We also thank Gretchen Sechrist, Sophie Woolston, and the lab group at the Yale Center for Eating and Weight Disorders for their assistance on various aspects of this work.

Correspondence concerning this article should be addressed to Rebecca M. Puhl, Department of Psychology, Yale University, Box 208205, 2 Hillhouse Avenue, New Haven, CT 06520-8205. E-mail: rebeccapuhl@comcast.net

Perceived Social Consensus and Stigma

The perceived social consensus model suggests that stigma and stereotypes are a function of perceptions of other people's stereotypical or stigmatizing beliefs (Stangor, Sechrist, & Jost, 2001a, 2001b). There is evidence that consensus information influences the endorsement of racial stereotypes and their subsequent resistance to change (Haslam et al., 1996; Stangor et al., 2001a; Wittenbrink & Henly, 1996). Sharing attitudes allows people to affiliate and to obtain membership, attention, emotional support, acceptance, approval, and security in social groups (Abrams & Hogg, 1990; Baumeister & Leary, 1995; Hill, 1987; Levine, Bogart, & Zdaniuk, 1996; Schaller & Conway, 1999; Stangor & Crandall, 2000; Stangor & Schaller, 2000). Individuals may also feel more confident in their attitudes if they perceive their beliefs to be shared by other group members (Sechrist, Stangor, & Jost, 1998).

Individuals' attitudes are also influenced by the perceived attitudes of groups they value (Levine, Resnick, & Higgins, 1993). Attitude change is more likely when information comes from a valued in-group (a social group with whom one identifies and values; Abrams, Wetherell, Cochrane, & Hogg, 1990; Haslam et al., 1996; Haslam, Oakes, Reynolds, & Turner, 1999; Martin, 1988; Sechrist & Stangor, 2001; Stangor et al., 2001a; Turner & Oakes, 1989; Wittenbrink & Henly, 1996). Data suggest individuals alter their endorsement of stereotypes toward racial minorities to be more similar to positive or negative attitudes expressed by an in-group (Haslam et al., 1996, 1999; Sechrist & Stangor, 2001; Stangor et al., 2001a; Wittenbrink & Henly, 1996).

Currently, negative portrayals of obese persons in the popular media may be contributing to stigma through creating norm misperceptions (Greenberg, Eastin, Hofshire, Lachlan, & Brownell, 2003). A social consensus model might be used to reduce antifat attitudes by emphasizing favorable beliefs about obese individuals among members of valued social groups.

The aim of the present research was to examine the influence of perceived consensus on attitudes toward obese people. Three experimental studies were designed to extend the previous work of Stangor and colleagues (2001a). As previous research has found that college students and younger people tend to exhibit a strong antifat bias (Schwartz et al., 2003; Teachman et al., 2003), we targeted university students for the samples in each of the three experiments. In Study 1 we tested the hypothesis that endorsement of weight stereotypes could be modified by manipulating perceived consensus of these beliefs. Given previous research on the important influence of a reference group in shaping attitudes, in Study 2 we tested the hypothesis that attitudes toward obese people are more likely to change if consensus feedback about stereotypes comes from an in-group versus an out-group source. This study also assessed whether attitude change is maintained over a short period of time. Finally, it is important to determine whether certain strategies of attitude modification are more effective than others so that stigma reduction interventions can be accurately informed and tested. Because so little experimental work has compared stigma reduction methods on attitudes toward obese people, in Study 3 we compared the impact of consensus feedback to other attitude change methods.

Several individual-difference variables were measured to determine their impact on antifat attitudes. These included (a) participants' own body weight, (b) perceptions about the causes and controllability of obesity, (c) strength of "just world beliefs," and (d) social desirability.

Experiment 1

The purpose of Experiment 1 was to test whether endorsement of stereotypes toward obese individuals can be changed by providing information about the perceptions of others' stereotypical beliefs. It was hypothesized that (a) participants who received feedback that other students have more favorable attitudes toward obese people than participants' original reported attitudes would change their own personal endorsement of stereotypes to be consistent with the consensus feedback and (b) participants who received feedback that others held more negative attitudes would express more negative and less positive stereotypes about obese individuals.

Method

Participants

Sixty undergraduate students (32 women, 28 men) who were enrolled in introductory psychology courses at Yale University participated in the experiment for course credit. Average age was 19.5 years, and mean body mass index (BMI) was 23.13 kg/m^2. Eighty percent of the sample was Caucasian, followed by 10% Asian and 7% Hispanic. Participation took place in two individual sessions, 1 week apart.

Measures

Obese Persons Trait Survey (OPTS). The OPTS was constructed with identical format to the racial trait survey by Stangor et al. (2001a). Participants are asked to estimate the percentage of obese persons who possess 20 stereotypical traits. These traits include 10 negative traits (lazy, undisciplined, gluttonous, self-indulgent, unclean, lack of willpower, unattractive, unhealthy, insecure, sluggish) and 10 positive traits (honest, generous, sociable, productive, organized, friendly, outgoing, intelligent, warm, humorous).

Traits were chosen to reflect the most commonly reported weight stereotypes (see Puhl & Brownell, 2001), drawing in part from existing measures (Allison, Basile, & Yuker, 1991; Lewis, Cash, Jacobi, & Bubb-Lewis, 1997; Teachman & Brownell, 2001). A list of 42 traits (21 negative and 21 positive stereotypes) was compiled and pilot tested with a convenience sample of 25 undergraduate and graduate students, who were asked to select the 10 negative and 10 positive traits from the larger lists that they felt were most typically applied to obese people. The 10 negative and 10 positive traits selected most frequently were chosen for the final survey. This measure had good internal reliability for both the positive traits subscale (α = .83) and the negative traits subscale (α = .73).

Beliefs About Obese Persons Scale (BAOP; Allison et al., 1991). Beliefs about the causes of obesity (personal control beliefs) were measured using this eight-item Likert rating scale. For each item, individuals indicate the extent of agreement or disagreement (3 to −3) to a statement about the causes of obesity. Coefficient alphas from various samples ranged from .65 to .82 (Allison et al., 1991). Higher scores on this measure reflect beliefs that obesity is not under personal control.

Marlowe–Crowne Social Desirability Scale (Crowne & Marlowe, 1960). This scale measures socially desirable response tendencies as well as the impact of social desirability on self-report measures specific to the purpose of investigation. This measure contains 33 statements and uses a true–false response format. The internal consistency coefficient of the scale is .88 (Crowne & Marlowe, 1960).

Just World Scale (Rubin & Peplau, 1975). This 20-item scale measures beliefs that the world is fair and orderly. Participants indicate their level of agreement on a 6-point continuum (0–5) with statements that refer to beliefs in a just world. Higher scores reflect stronger beliefs that the world is basically fair and just. This measure has demonstrated adequate internal reliability (α = .80; Rubin & Peplau, 1975).

BMI. Self-reported height and weight were obtained from participants to calculate their BMI. Overweight is defined as having a BMI of 25 kg/m^2 or more, and obesity, a BMI of 30 kg/m^2 or more.

Procedure

Participants were told that the study examined perceptions of different groups and that they would be asked to make judgments about a particular social group. As part of the cover story, participants were told that their survey had been randomly chosen by a computer from a larger set of surveys that were being administered, that they may have to complete the same survey more than once because of the random selection procedures by the computer, and that if this should happen, they should review the questions again and complete the measures a second time. Participants were given the OPTS, then completed the BAOP, followed by the remaining three attitude measures, which were counterbalanced.

One week later, participants returned for a second session. The experimenter commented to the participant that he or she might be interested in the beliefs about obese persons expressed by other students who had completed the same survey. Participants were then given information supposedly documenting the average percentage ratings of other students who believed that obese people possessed each of the different positive and negative traits. In reality, each participant received unique feedback that was constructed according to the participant's own ratings completed the week previously. Participants were randomly assigned to one of two feedback conditions for this manipulation. In the favorable feedback condition, participants learned that other students had estimated that more obese people possessed positive traits and a lower percentage of obese people possessed negative traits, as compared with their own responses the week before. An average of 20 points (randomly varying between 18 and 22 points) were added to each participant's percentage ratings of positive traits, and 20 points were subtracted from percentage estimates of negative traits. In the unfavorable feedback condition, participants learned that other students had estimated that fewer obese people possessed positive traits and a higher percentage of obese people possessed negative traits, as compared with their own responses. Here, 18–22 points were added to participants' previous percentage ratings of negative traits and subtracted from positive traits,[1] replicating the procedures of Stangor et al. (2001a).

After examining this feedback, confirmation that participants had attended to the consensus feedback was assessed by having them indicate how surprised they were by the ratings of other students for each of the 20 traits on a Likert rating scale (1 = *not at all surprised,* 9 = *extremely surprised*). Then, participants completed the OPTS again, followed by the BAOP.

Results

Thirty participants were randomly assigned to each feedback condition (17 women and 13 men in the favorable feedback condition and 15 women and 15 men in the unfavorable feedback condition). A univariate analysis of variance (ANOVA) showed that there were no significant gender differences on the measures. BMI and the social desirability scale were not significantly correlated with the primary variables or trait ratings. Further correlational and median-split analyses confirmed that social desirability was not significantly related to initial or final trait ratings, or to change scores in trait ratings across time. Confidence ratings on the OPTS were significantly positively correlated with both positive and negative stereotype ratings (for a table of covariate analyses across all three experiments, please contact Rebecca M. Puhl).

Table 1
Experiment 1: Mean Percentage Ratings of Obese Persons Believed to Possess Positive and Negative Traits as a Function of Consensus Feedback and Time of Measurement

Consensus feedback condition	Time of measurement			
	Pre		Post	
	M	*SD*	*M*	*SD*
Favorable				
Negative traits	61.27_a	10.09	53.54_b	13.91
Positive traits	51.38_a	10.98	58.71_b	11.19
Unfavorable				
Negative traits	59.14	16.67	60.55	13.06
Positive traits	55.56	7.91	56.42	9.37

Note. Different subscripts within a row indicate that the two means are significantly different at $p < .05$ by planned comparisons.

A 2 (type of feedback: favorable, unfavorable) × 2 (trait valence: positive, negative) × 2 (time of measurement) ANOVA with repeated measures on the last two factors was computed. There was a significant main effect for trait valence, for which students estimated a higher percentage of obese persons to have negative traits (M = 58.63) than positive traits (M = 55.40), $F(1, 58) = 4.37$, $p < .05$. There was also a significant three-way interaction between feedback, trait valence, and time of measurement, $F(1, 58) = 6.02$, $p < .05$. As predicted, students' endorsement of negative traits decreased in the favorable consensus feedback condition and endorsement of positive traits increased. However, trait ratings did not change in the unfavorable feedback condition. Table 1 shows mean percentage ratings of obese people believed to possess positive and negative traits in each feedback condition at Time 1 and Time 2. There were no other interactions or main effects.

A second 2 (feedback: favorable, unfavorable) × 2 (time of measurement) ANOVA with repeated measures on the BAOP was computed to determine the impact of consensus feedback on beliefs about the causality of obesity. There was a significant main effect of feedback, $F(1, 58) = 4.47$, $p < .05$, and a significant interaction between the measures and feedback, $F(1, 58) = 5.45$, $p < .05$; participants who received favorable feedback increased their scores on the BAOP from Time 1 (M = 15.60, SD = 5.93) to Time 2 (M = 17.10, SD = 6.30). Thus, favorable consensus feedback increased beliefs that the causes of obesity are not under personal control.

Discussion

As predicted, participants who received favorable consensus feedback reported more positive and fewer negative traits about

[1] For approximately 10% of the positive and negative traits in Experiments 1 and 3, participants provided a percentage rating where adding the assigned amount resulted in a number larger than 100% or subtracting the assigned amount resulted in a number less than 0%. In these instances, the trait was designated as either 98% or 2%, respectively.

obese people 1 week later. Thus, this study shows that expressed attitudes can be modified by providing consensus information about the beliefs of others. In contrast to predictions, beliefs toward obese people did not change following unfavorable consensus feedback. Experiment 1 also illustrated that consensus information influenced beliefs about the causes of obesity, consistent with our hypothesis that positive attitudes are related to beliefs that obesity is caused by factors outside of personal control.

Experiment 2

Experiment 2 examined whether consensus information is more influential in modifying traits if it comes from an in-group versus an out-group. We predicted that consensus information would have greater influence when coming from an in-group (people with whom the participant identifies). This hypothesis was tested by providing participants (Yale students) with favorable consensus feedback ostensibly from either "Ivy League students" or "community college students." Because Experiment 1 showed that attitudes toward obese people were more likely to change in a positive direction, and because we did not want to increase negative attitudes, experimental manipulations in Experiment 2 attempted to induce only positive changes in stereotypical beliefs.

A second objective was to assess whether changes in expressions of traits could be maintained over time and demonstrated in a later testing session that participants believed was unrelated to the first experimental session. As discussed by Stangor et al. (2001a), meeting this objective would demonstrate whether consensus information has the potential to produce lasting changes in beliefs over time and would rule out certain demand characteristics commonly found in repeated measures designs.

Method

Participants

Participants were 55 undergraduate students (33 women, 22 men) from introductory psychology courses at Yale University who participated in the experiment for course credit. Average age was 21.25 years, and mean BMI was 22.66 kg/m^2. Forty-nine percent of the sample was Caucasian, 26% Asian, 16% African American, and 4% Hispanic. Participation took place in two individual sessions, 1 week apart. Participants were randomly assigned to one of two favorable feedback conditions. There were 28 students (17 women and 11 men) in the in-group feedback condition and 27 students (16 women and 11 men) in the out-group condition.

Procedure

The first experimental session was identical to Study 1, except that when provided with consensus information, participants were told that the feedback reflected attitudes from either in-group or out-group members. With random assignment, half of the participants received information about the beliefs of Ivy League students (in-group) toward obese people, and half received information about attitudes of community college students (out-group). The direction of feedback information in both conditions was the same, indicating to participants that others held more favorable beliefs about obese individuals as compared with their own reported attitudes. The favorable consensus feedback was derived using the same procedure outlined in Experiment 1. Following completion of the OPTS, the experimenter retrieved this survey and constructed the consensus feedback information while participants completed the remaining questionnaires.

One week later, participants completed the second session. To address the second objective of Experiment 2, we arranged for participants to report to a different room and be met by a different experimenter, who introduced the study as an experiment about social decision making. Participants were asked to make a variety of judgments about social groups and were given a survey that asked them to report their feelings toward five different groups (gay men and lesbians, senior citizens, African Americans, obese individuals, and Mexican Americans). This measure was modified from research by Abelson, Kinder, Peters, and Fiske (1982). The internal reliability for the subscale about obese people was .76, and the reliability of the remaining four subscales ranged from .55 for homosexuals to .82 for Mexican Americans. Participants were asked to provide responses to 10 yes–no forced-choice statements concerning their opinions about these groups and were asked with a single question to rate their feelings toward each group on a 9-point scale ranging from 1 (*not at all favorable*) to 9 (*very favorable*; Stangor et al., 2001a). The feeling rating for obese individuals was used as the dependent measure.

Results

A one-way ANOVA was used to assess gender differences. Women gave higher mean ratings of positive traits about obese people on the OPTS (M = 53.19, SD = 8.77) than men (M = 47.24, SD = 9.50), $F(1, 53) = 5.62$, $p < .05$. No other gender differences occurred, and there was insufficient power to detect effects of ethnicity on the measures. As in Experiment 1, BMI and the social desirability scale were not significantly correlated with any of the primary variables, trait ratings, or trait change scores. Confidence ratings on the OPTS were significantly positively correlated with both positive and negative stereotype ratings.

There was a significant main effect of stereotype traits, in which negative traits about obese people were assigned higher mean percentage ratings (M = 60.02) by participants than positive traits (M = 50.81), $F(1, 53) = 24.39$, $p < .001$. A 2 (trait: positive, negative) $\times$ 2 (feedback source: in-group, out-group) ANOVA was computed. There was a significant main effect of feedback source, $F(1, 53) = 4.29$, $p < .05$, indicating that the dependent variable of "feeling ratings" toward obese people (reported in the second experimental session) were more positive among participants who received feedback from the in-group (M = 6.39, SD = 1.45) as compared with the out-group source (M = 5.63, SD = 1.27).

Discussion

These results show that favorable consensus feedback has more influence on reported attitudes when it comes from an in-group versus an out-group source. These results parallel findings of Stangor et al. (2001a) and provide additional support for self-categorization theory, which proposes that individuals will perceive in-group members to possess more credible knowledge than out-group members. In-group consensus information can lead to attitude modification on a different outcome measure of reported feelings toward the target group. The finding that consensus feedback changed attitudes of participants both 1 week later and in a different situational context suggests that there is potential for this method to be a useful tool in promoting longer term change in attitudes about obese people.

Experiment 3

The objective of Experiment 3 was to compare consensus information with four other attitude change methods in modifying

stereotypes about obese people. Participants were assigned to one of five conditions: Condition 1 was an in-group favorable consensus feedback scenario. In Condition 2, participants received information purportedly documenting the "true prevalence of traits among obese people according to scientific research" (in reality, participants received unique feedback created using procedures identical to those used in Experiments 1 and 2 to construct favorable consensus information). The only difference between Conditions 1 and 2 was that participants in Condition 1 were told that the percentage ratings of traits reflected the beliefs of Ivy League students, and participants in Condition 2 were told that the percentages reflected the "actual" prevalence as determined by research. Although Stangor et al. (2001a) used a similar method to change racial stereotypes after receiving consensus feedback, we implemented this method as a direct comparison to consensus feedback to examine normative and informational influences on expression of traits.

In Condition 3, participants read a brief vignette emphasizing uncontrollable causes for obesity, which specifically focused on genetic and biological components of weight (the vignette was written to resemble an article from the science section of *The New York Times,* to facilitate believability). In Condition 4, a vignette of identical format and matched for length to Condition 3 was used, except that the content instead described causes of obesity that are within personal control, specifically, overeating and lack of exercise (Conditions 3 and 4 were designed to help clarify the role of perceived controllability of obesity on attitudes toward obese people). In Condition 5, a control group, participants received no information following completion of measures at Time 1 or prior to completion of the same measures at Time 2. Among these conditions, participants who received favorable consensus feedback were hypothesized to demonstrate at least equivalent, if not more, positive change in reported attitudes as compared with those who were provided with information about the prevalence of traits among obese people or those who read vignettes about the causes of obesity.

Method

Participants

Participants were 200 undergraduate students (139 women, 61 men) enrolled in introductory psychology courses at Yale University who participated for course credit or for $10. Average age was 19.65 years, and mean BMI was 21.84 kg/m^2. Fifty-six percent of the sample was Caucasian, followed by 22% Asian, 11% African American, and 6% Hispanic. As in the first two experiments, participation took place in two individual sessions, 1 week apart. Forty students were randomly assigned to each of the five experimental conditions.

Procedure

The first session was identical to Experiments 1 and 2, in which participants were given the OPTS, the BAOP, and the attitude measures in counterbalanced order. One week later, students returned to complete the second session. In Condition 1, participants received favorable in-group consensus feedback and were asked to indicate how surprised they were by this information on a Likert rating scale (1 = *not at all surprised,* 9 = *extremely surprised*).

Condition 2 provided participants with information about the prevalence of traits in obese people listed in the trait survey. Participants were told that these data reflected the "actual" prevalence of these characteristics among obese individuals, as determined by scientific research. To ensure that participants attended to this information, they were asked to report their degree of surprise for percentages allocated to each trait on a Likert scale (1 = *not at all surprised,* 9 = *extremely surprised*).

In Conditions 3 and 4, participants were asked to read the vignette, presented as an excerpt from *The New York Times*. To ensure that participants attended to the information, they were asked to respond to several written questions following the vignette about how surprised they were by the findings of the article, how much control they believed individuals have over weight, and their agreement with several statements concerning the causes of obesity.

After completing their assigned task, participants in all five conditions were asked again to complete the OPTS, followed by the BAOP. Participants in the control condition received no other information and simply completed these measures for a second time. Of note, 16 students across the three experiments either did not show for their scheduled first experimental session or did not return to complete the second session. All of these participants were removed from data entry and excluded from the study, and additional students were recruited in their place to ensure that there were an appropriate number of students in each condition of the three experiments.

Results

One-way ANOVAs were computed to determine any significant gender differences on measures. Women gave higher mean ratings of positive traits about obese people on the OPTS at Time 2 (M = 57.81, SD = 12.48) as compared with men (M = 53.14, SD = 11.94), $F(1, 198) = 6.10$, $p < .05$. No other gender differences occurred, and there was insufficient power to detect effects of ethnicity on the measures.

Participant responses to the written vignettes in Conditions 3 and 4 were analyzed using one-way ANOVAs. As expected, individuals in the controllable causes condition endorsed beliefs that people have significantly more personal control in preventing obesity ($M = 4.95$, $SD = 0.83$) as compared with individuals in the uncontrollable causes condition (M = 3.58, SD = 1.11), $F(1, 78) = 38.95$, $p < .0001$. In addition, individuals who read about the uncontrollable causes of obesity endorsed greater agreement that obesity is caused by factors outside of personal control (M = 3.15, SD = 0.59) than those who read about controllable causes (M = 2.51, SD = 0.64), $F(1, 78) = 21.40$, $p < .0001$. Finally, participants who read about the controllable causes of obesity endorsed greater agreement that obesity is caused by personal control (M = 3.15, SD = 0.43) as compared with those in the uncontrollable causes condition (M = 2.68, SD = 0.62), $F(1, 78) = 15.96$, $p < .0001$.

Stereotype Ratings

Paired sample t tests revealed that at Time 1, negative traits were assigned significantly higher mean ratings than positive traits in the consensus feedback condition, $t(39) = 2.81$, $p < .01$; control group, $t(39) = 3.08$, $p < .01$; and uncontrollable causes condition, $t(39) = 2.18$, $p < .05$. There were no significant differences in mean ratings of positive and negative traits in the trait prevalence and controllable causes conditions, likely owing to slightly higher initial mean ratings of positive traits in these groups. At Time 2, positive traits were assigned significantly higher percentage ratings than negative traits in the consensus information, $t(39)$ =

2.16, $p < .05$, and trait prevalence, $t(39) = 6.33$, $p < .001$, conditions. However, negative traits remained significantly higher than positive traits in the control group, $t(39) = 2.32$, $p < .05$, and controllable causes, $t(39) = 2.18$, $p < .05$, conditions. There was no significant difference between positive and negative ratings at Time 2 in the uncontrollable causes condition. Mean ratings of positive and negative traits across each condition at both testing times are presented in Table 2.

As predicted, individuals in the consensus information condition significantly increased their percentage estimates of positive traits and lowered their percentage ratings of negative traits toward obese people. These findings were also true in the trait prevalence condition. No changes occurred in trait ratings in the control group, and there was no change in positive traits in either of the causality information conditions. Percentage estimates of negative traits decreased in the uncontrollable causes condition and actually increased in the controllable causes condition.

A 5 (experimental condition: consensus information, control group, trait prevalence, uncontrollable causes, controllable causes) × 2 (time of measurement) × 2 (trait valence: positive, negative) ANOVA with repeated measures on the last two factors was computed. There was a significant interaction between experimental condition and positive trait ratings, $F(4, 195) = 5.97$, $p < .0001$, and a significant interaction between experimental condition and negative trait ratings, $F(4, 195) = 7.90$, $p < .0001$ (see Figure 1).

To determine whether differences from the interactions supported our initial predictions, we performed planned comparisons of trait ratings in the consensus feedback condition with each of the four conditions, using four separate repeated measures ANOVAs. A Bonferroni correction was applied so that a p value of .0125 was necessary to achieve statistical significance. There were no significant differences between consensus feedback and the uncontrollable causes, controllable causes, or control group conditions in degree of increased positive trait ratings from Time 1 to Time 2. However, the trait prevalence condition increased ratings of positive traits higher than consensus feedback did, $F(1, 78) = 6.70$, $p = .01$.

Table 2
Experiment 3: Mean Ratings of Positive and Negative Traits on the OPTS Across Five Conditions

	Time of measurement			
	Pre		Post	
Experimental condition	*M*	*SD*	*M*	*SD*
Consensus feedback				
Negative traits	59.15	12.84[a]	50.38	15.02[b]
Positive traits	52.71	8.71[a]	56.77	9.73[b]
Control group				
Negative traits	57.81	9.67	58.03	10.66
Positive traits	51.54	8.94	52.81	10.63
Prevalence feedback				
Negative traits	57.49	13.19[a]	43.40	18.05[b]
Positive traits	54.83	9.51[a]	66.76	10.84[b]
Uncontrollable causes				
Negative traits	57.17	12.47[a]	51.32	13.96[b]
Positive traits	52.26	11.86	51.46	13.46
Controllable causes				
Negative traits	56.66	14.46[a]	63.04	19.29[b]
Positive traits	54.25	11.18	54.11	11.59

Note. Different subscripts within a row indicate that the two means are significantly different at $p < .01$ by planned comparisons. OPTS = Obese Persons Trait Survey.

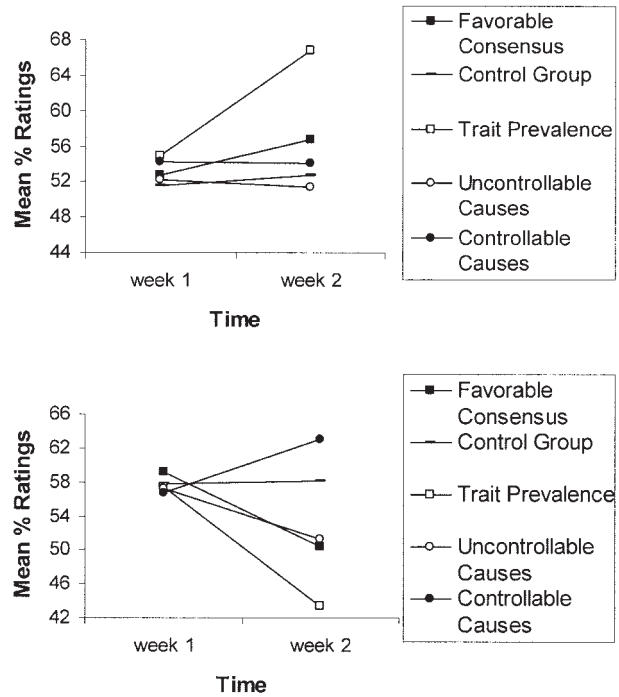

Figure 1. Experiment 3: Mean trait ratings across conditions at Times 1 and 2. Upper graph reflects positive traits; lower graph reflects negative traits.

For negative trait ratings, planned comparisons revealed that favorable consensus feedback reduced negative trait ratings significantly more than the control group, $F(1, 78) = 7.46$, $p = .008$, and controllable causes condition, $F(1, 78) = 14.66$, $p < .0001$, but did not differ from the trait prevalence and uncontrollable causes conditions. Of note, all 20 positive and negative trait ratings significantly changed in the trait prevalence condition.

Three additional planned comparisons were performed to determine whether differences in trait ratings occurred between the trait prevalence condition and each of the causality information conditions. A Bonferroni correction was applied so that a p value of .016 was necessary to achieve statistical significance. The trait prevalence condition increased positive ratings significantly more than the uncontrollable causes condition, $F(1, 78) = 10.38$, $p = .002$, and the controllable causes condition, $F(1, 78) = 12.51$, $p = .001$, and reduced negative trait ratings significantly more than the controllable causes condition, $F(1, 78) = 8.34$, $p = .005$. Participants in the uncontrollable causes condition reported significantly lower negative ratings than participants in the controllable causes condition, $F(1, 78) = 20.84$, $p < .0001$.

Beliefs About Obesity

Secondary analyses were carried out on personal control beliefs (as measured by the BAOP) to determine whether any of the

experimental conditions influenced beliefs about the causality of obesity and controllability of weight. Univariate ANOVAs showed no significant differences on these measure across conditions at Time 1. Refer to Figure 2 for mean scores on the BAOP for each of the five conditions at both testing sessions.

A 5 (experimental condition: consensus information, control group, trait prevalence, uncontrollable causes, controllable causes) × 2 (time of measurement) × 1 (BAOP) ANOVA with repeated measures on the last factor was computed. There was a significant main effect of experimental condition, $F(4, 170) = 2.99$, $p = .02$, indicating that beliefs that obesity is not within personal control increased from Time 1 to Time 2 in the consensus information, prevalence feedback, and uncontrollable causes conditions and decreased in the controllable causes condition.

To determine whether differences from the interactions supported our initial predictions, we performed planned comparisons on mean scores of personal control beliefs (BAOP) and weight locus of control in the consensus feedback condition with each of the other four conditions, using four separate repeated measures ANOVAs. A Bonferroni correction was applied so that a p value of .0125 was necessary to achieve statistical significance. Planned comparisons revealed that there were no significant differences in beliefs about the causes of obesity from Time 1 to Time 2 between the consensus information condition and the other four conditions. Personal control beliefs decreased among participants in the controllable causes condition as compared with the uncontrollable causes condition, $F(1, 68) = 10.42$, $p = .002$.

General Discussion

These three experiments support the hypothesis that attitudes toward obese people are influenced by people's perceptions of the consistency of their attitudes with others. Consensus theory predicts trait change in both directions, but Experiment 1 showed that there were significant trait changes in a positive, but not negative, direction. Stangor et al. (2001a) also found that attitudes were easier to manipulate in a positive direction and hypothesized that social desirability may have been responsible; however, in all three experiments, measures of social desirability and endorsement of traits were not related, and participants expressed more negative traits than positive traits. Consensus information may have had less influence on negative trait ratings in Experiment 1 because they were initially so high, creating a ceiling effect.

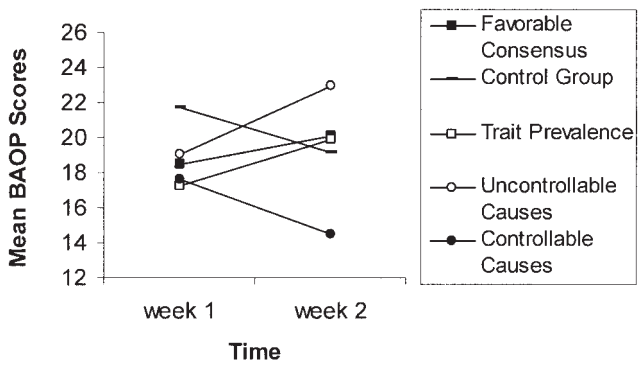

Figure 2. Experiment 3: Mean scores on the BAOP across five conditions at Times 1 and 2. Higher scores reflect beliefs that obesity is not under personal control. BAOP = Beliefs About Obese Persons Scale.

Consistent with our hypothesis, Experiment 2 showed that consensus information was more influential in modifying traits about obese people when coming from an in-group versus an out-group source. In addition, favorable consensus information increased positive feelings about obese people on a different outcome measure 1 week later in a different situational context, which suggests that a genuine change had occurred. These findings support the proposal that people acquire information from those who they value and identify with, and that consensus information can generate a sustained shift in reported attitudes. However, given that the time period assessed in this experiment was 1 week, additional research with longer testing periods needs to be conducted to determine the degree to which attitude changes are sustained.

Experiment 3 showed that favorable consensus information significantly increased positive traits and decreased negative traits, as predicted. However, the trait prevalence feedback improved positive traits to a higher degree than consensus information. This finding raises questions about the impact of normative social influence, which reflects conformity with the positive expectations of others, and informational social influence, which involves accepting information from others as evidence of reality (Deutsch & Gerard, 1955). The trait prevalence feedback condition taps into informational social influence, and given that both of these conditions improved attitudes, combining these approaches may be useful in stigma reduction.

Reading about the uncontrollable causes of obesity in Experiment 3 did not improve positive traits but did reduce negative traits and decreased beliefs that obesity is caused by personally controllable factors. In contrast, reading about controllable causes not only increased beliefs that obesity is caused by controllable factors but increased negative traits as well. With numerous societal messages that suggest body weight is within personal control (e.g., in diet books and magazines), messages involving attributions of personal control may make negative stereotypes worse (Geier, Schwartz, & Brownell, 2003). Taken together, findings from Experiment 3 show that providing information about the uncontrollable causes of obesity is not necessary to improve attitudes toward obese people, and providing people with favorable consensus or trait prevalence information improves attitudes and leads to perceptions that obesity is caused by factors outside of personal control.

A particularly novel and striking finding in this research is that social consensus feedback not only changed attitude responses but also changed attributions about the perceived causes and controllability of obesity. This suggests that conformity to a reference group may involve more than imitation of responses, as there was no mention of the causes of obesity in the social consensus feedback, and participants made these inferences on their own.

There are several limitations in the current research. First, generalizability needs to be tested, because all participants were college students. It is important to examine attitude change in ethnically diverse populations, given that cross-cultural differences have been found in antifat attitudes (Hebl & Heatherton, 1998). It is possible that college students place high value in science, which may help explain the impact of trait prevalence feedback in Experiment 3.

Second, the self-report nature of the experiments makes it difficult to ascertain the degree to which changes in endorsement of traits indicate genuine changes in attitudes and whether they can translate into concrete behavioral changes. There may be distinctions between overt expressions of stereotypes and genuine attitudes and related behaviors. Third, although all participants were debriefed in each experiment, which included a manipulation check to ensure that students believed the cover story of the study, these data were not systematically assessed.

Although there is agreement about the need to address the complex medical implications of obesity, efforts must increase to change the hostile societal environment that many obese people face, a change that will require psychological and social targets of intervention. Given that stigma is pervasive in health care settings, it is important for existing and future generations of students in medicine, psychology, nursing, nutrition, and other health-related fields to participate in stigma reduction interventions as part of their training. Health care professionals can play an important role in these efforts. First, our findings suggest that people are influenced by perceptions of others' beliefs about obese persons. Thus, to the degree that students overestimate negative and underestimate positive traits about obese individuals, a possible target for stigma reduction may be providing students with accurate information about the attitudes toward obese persons endorsed by others in valued reference groups. To motivate students to identify with desirable in-groups who condemn antifat attitudes, valued in-group members (such as physicians, faculty members, or admired peers) are needed to communicate these attitudes. One way of accomplishing this may be to identify and train peer leaders among students and/or admired in-group members in health care and educational settings (such as physicians or professors) to advocate weight tolerance and communicate positive attributes of obese people.

Second, it appears that education about uncontrollable causes of obesity may be helpful to reduce negative attitudes, although according to our findings this method may be unable to increase positive stereotypes, and previous work has reported mixed results using similar methods (Bell & Morgan, 2000; Crandall, 1994; Teachman et al., 2003). Still, including this as an intervention component in health care training settings may be useful to help dispel widespread perceptions that the body is infinitely malleable (Brownell, 1991). Information about the complex etiology of obesity could be disseminated in a variety of ways to students, including communication by valued in-group members and peer leaders as mentioned above, or as part of course curricula through written materials describing genetic and biological components of weight.

Third, our findings showed that providing research-based prevalence rates of traits about obese people was a powerful method of attitude change. Given the absence of research on actual prevalence rates of traits among obese people and the difficulty of measuring them, a challenge for researchers in the obesity field is to identify prevalence rates of measurable traits (e.g., intelligence) and to determine when shared opinions about obese people are consistent with scientific data and when they are incorrect. For example, one study showed that people overestimated the likelihood that obese patients are noncompliant with their physician's advice, despite there being no data to suggest this relationship exists (Madey & Ondrus, 1999). It will be useful to obtain scientific data to illustrate these types of illusory associations and to disseminate this information to students who are training in health-related fields.

Given the acceptability of antifat attitudes, intervention approaches that combine multiple attitude-change strategies may be needed to tackle the complexities of obesity stigma. As our findings demonstrated several methods of attitude change to be effective, the next step is to determine how to implement these methods to construct and test a comprehensive stigma reduction intervention. The implications for advancing the field in this area are potentially far reaching. Professionals in health care settings can be valuable in these efforts by communicating positive attributes of obese people and educating students about the complex etiology of obesity to help eradicate negative attitudes, so that obese individuals do not bear this burden alone or face additional health consequences created by stigma.

References

Abelson, R. P., Kinder, D. R., Peters, M. D., & Fiske, S. T. (1982). Affective and semantic components of political person perception. *Journal of Personality and Social Psychology, 42,* 619–630.

Abrams, D., & Hogg, M. A. (1990). Social identification, self-categorization and social influence. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 1, pp. 195–228). Chichester, England: Wiley.

Abrams, D., Wetherell, M., Cochrane, S., & Hogg, M. (1990). Knowing what to think by knowing who you are: Self-categorization and the nature of norm formation, conformity, and group polarization. *British Journal of Social Psychology, 29,* 97–119.

Allison, D. B., Basile, V. C., & Yuker, H. E. (1991). The measurement of attitudes toward and beliefs about obese persons. *International Journal of Eating Disorders, 10,* 599–607.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117,* 497–529.

Bell, S. K., & Morgan, S. B. (2000). Children's attitudes and behavioral intentions toward a peer presented as obese: Does a medical explanation for the obesity make a difference? *Journal of Pediatric Psychology, 25,* 137–145.

Blumberg, P., & Mellis, L. P. (1980). Medical students' attitudes toward the obese and morbidly obese. *International Journal of Eating Disorders, 4,* 169–175.

Brownell, K. D. (1991). Personal responsibility and control over our bodies: When expectation exceeds reality. *Health Psychology, 10,* 303–310.

Carpenter, K. M., Hasin, D. S., Allison, D. B., & Faith, M. S. (2000). Relationships between obesity and *DSM–IV* major depressive disorder, suicide ideation, and suicide attempts: Results from a general population study. *American Journal of Public Health, 90,* 251–257.

Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66,* 882–894.

Crandall, C. S., & Cohen, C. (1994). The personality of the stigmatizer: Cultural world view, conventionalism, and self-esteem. *Journal of Research in Personality, 28,* 461–480.

Crandall, C. S., D'Anello, S., Sakalli, N., Lazarus, E., Wieczorkowska, G., & Feather, N. T. (2001). An attribution-value model of prejudice: Anti-fat attitudes in six nations. *Personality and Social Psychology Bulletin, 27,* 30–37.

Crandall, C. S., & Martinez, R. (1996). Culture, ideology, and antifat attitudes. *Personality and Social Psychology Bulletin, 22,* 1165–1176.

Crandall, C. S., & Schiffhauer, K. L. (1998). Anti-fat prejudice: Beliefs, values, and American culture. *Obesity Research, 6,* 458–460.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 4,* 349–354.

Davis-Coelho, K., Waltz, J., & Davis-Coelho, B. (2000). Awareness and prevention of bias against fat clients in psychotherapy. *Professional Psychology: Research and Practice, 31,* 682–684.

Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal Psychology, 51,* 629–636.

Eisenberg, M. E., Neumark-Sztainer, D., & Story, M. (2003). Associations of weight-based teasing and emotional well-being among adolescents. *Archives of Pediatrics & Adolescent Medicine, 157,* 733–738.

Fontaine, K. R., Faith, M. S., Allison, D. B., & Cheskin, L. J. (1998). Body weight and health care among women in the general population. *Archives of Family Medicine, 7,* 381–384.

Gapinski, K. D., Schwartz, M. B., & Brownell, K. D. (2003). *A media approach to changing antifat attitudes and behavior.* Manuscript submitted for publication.

Geier, A. B., Schwartz, M. B., & Brownell, K. D. (2003). "Before and after" diet advertisements escalate weight stigma. *Eating and Weight Disorders: Studies on Anorexia, Bulimia, and Obesity, 8,* 282–288.

Greenberg, B. S., Eastin, M., Hofshire, L., Lachlan, K., & Brownell, K. D. (2003). The portrayal of overweight and obese individuals on commercial television. *American Journal of Public Health, 93,* 1342–1348.

Guyll, M., Matthews, K. A., & Bromberger, J. T. (2001). Discrimination and unfair treatment: Relationship to cardiovascular reactivity among African American and European American women. *Health Psychology, 20,* 315–325.

Haslam, S. A., Oakes, P. J., McGarty, C., Turner, J. C., Reynolds, K. J., & Eggins, R. A. (1996). Stereotyping and social influence: The mediation of stereotype applicability and sharedness by the views of in-group and out-group members. *British Journal of Social Psychology, 35,* 369–397.

Haslam, S. A., Oakes, P. J., Reynolds, K. J., & Turner, J. C. (1999). Social identity salience and the emergence of stereotype consensus. *Personality and Social Psychology Bulletin, 25,* 809–818.

Hebl, M. R., & Heatherton, T. F. (1998). The stigma of obesity in women: The difference is black and white. *Personality and Social Psychology Bulletin, 24,* 417–426.

Hebl, M. R., & Xu, J. (2001). Weighing the care: Physicians' reactions to the size of a patient. *International Journal of Obesity, 25,* 1246–1252.

Hill, C. A. (1987). Affiliation motivation: People who need people . . . but in different ways. *Journal of Personality and Social Psychology, 52,* 1008–1018.

Kristeller, J. L., & Hoerr, R. A. (1997). Physician attitudes toward managing obesity: Differences among six specialty groups. *Preventive Medicine, 26,* 542–549.

Levine, J. M., Bogart, L. M., & Zdaniuk, B. (1996). Impact of anticipated group membership on cognition. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Vol. 3. The interpersonal context* (pp. 531–567). New York: Guilford Press.

Levine, J. M., Resnick, L. B., & Higgins, E. T. (1993). Social foundations of cognition. *Annual Review of Psychology, 44,* 585–612.

Lewis, R. J., Cash, T. F., Jacobi, L., & Bubb-Lewis, C. (1997). Prejudice toward fat people: The development and validation of the Antifat Attitudes Test. *Obesity Research, 5,* 297–307.

Maddox, G. L., & Liederman, V. (1969). Overweight as a social disability with medical implications. *Journal of Medical Education, 44,* 214–220.

Madey, S. F., & Ondrus, S. A. (1999). Illusory correlations in perceptions of obese and hypertensive patients' noncooperative behaviors. *Journal of Applied Social Psychology, 29,* 1200–1217.

Maroney, D., & Golub, S. (1992). Nurses' attitudes toward obese persons and certain ethnic groups. *Perceptual and Motor Skills, 75,* 387–391.

Martin, R. (1988). In-group and out-group minorities: Differential impact upon public and private responses. *European Journal of Social Psychology, 18,* 39–52.

Olson, C. L., Schumaker, H. D., & Yawn, B. P. (1994). Overweight women delay medical care. *Archives of Family Medicine, 3,* 888–892.

Price, J. H., Desmond, S. M., Krol, R. A., Snyder, F. F., & O'Connell, J. K. (1987). Family practice physicians' beliefs, attitudes, and practices regarding obesity. *American Journal of Preventive Medicine, 3,* 339–345.

Puhl, R., & Brownell, K. D. (2001). Obesity, bias, and discrimination. *Obesity Research, 9,* 788–805.

Puhl, R., & Brownell, K. D. (2003). *The stigma of obesity: Psychosocial origins of pervasive bias.* Manuscript submitted for publication.

Rubin, Z., & Peplau, L. A. (1975). Who believes in a just world? *Journal of Social Issues, 31,* 65–89.

Schaller, M., & Conway, L. G. (1999). Influence of impression-management goals on the emerging contents of group stereotypes: Support for a social-evolutionary process. *Personality and Social Psychology Bulletin, 25,* 819–833.

Schwartz, M. B., Chambliss, H. O., Brownell, K. D., Blair, S. N., & Billington, C. (2003). Weight bias among health professionals specializing in obesity. *Obesity Research, 11,* 1033–1039.

Sechrist, G. B., & Stangor, C. (2001). Perceived consensus influences intergroup behavior and stereotype accessibility. *Journal of Personality and Social Psychology, 80,* 645–654.

Sechrist, G. B., Stangor, C., & Jost, J. T. (1998). *Confidence and identification as mediators of perceived consensus.* Unpublished data, University of Maryland.

Stangor, C., & Crandall, C. S. (2000). Threat and social construction of stigma. In T. F. Heatherton, R. E. Kleck, M. R. Hebl, & J. G Hull (Eds.), *The social psychology of stigma* (pp. 62–87). New York: Guilford Press.

Stangor, C., & Schaller, M. (2000). Stereotypes as individual and collective representations. In C. Stangor (Ed.), *Stereotypes and prejudice: Essential readings (Key readings in social psychology)* (pp. 64–82). Philadelphia: Psychology Press and Taylor & Francis.

Stangor, C., Sechrist, G. B., & Jost, J. T. (2001a). Changing beliefs by providing consensus information. *Personality and Social Psychology Bulletin, 27,* 486–496.

Stangor, C., Sechrist, G. B., & Jost, J. T. (2001b). Social influence and intergroup beliefs: The role of perceived social consensus. In J. P. Forgas & K. D. Williams (Eds.), *Social influence: Direct and indirect processes* (pp. 235–252). Philadelphia: Psychology Press.

Strauss, R. S., & Pollack, H. A. (2003). Social marginalization of overweight children. *Archives of Pediatrics & Adolescent Medicine, 157,* 746–752.

Teachman, B. A., & Brownell, K. D. (2001). Implicit anti-fat bias among health professionals: Is anyone immune? *International Journal of Obesity, 25,* 1525–1531.

Teachman, B. A., Gapinski, K. D., Brownell, K. D., Rawlins, M., & Jeyaram, S. (2003). Demonstrations of implicit anti-fat bias: The impact of providing causal information and evoking empathy. *Health Psychology, 22,* 68–78.

Turner, J. C., & Oakes, P. J. (1989). Self-categorization theory and social influence. In P. B. Paulus (Ed.), *The psychology of group influence* (2nd ed., pp. 233–275). Hillsdale, NJ: Erlbaum.

Weiner, B., Perry, R. P., & Magnusson, J. (1988). An attributional analysis of reactions to stigma. *Journal of Personality and Social Psychology, 55,* 738–748.

Wiese, H. J., Wilson, J. F., Jones, R. A., & Neises, M. (1992). Obesity stigma reduction in medical students. *International Journal of Obesity, 16,* 859–868.

Wittenbrink, B., & Henly, J. R. (1996). Creating social reality: Informational social influence and the content of stereotypic beliefs. *Personality and Social Psychology Bulletin, 22,* 598–610.