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Prejudice Toward Individuals With Obesity: Evidence for a Pro-Effort Bias

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Three studies examined the role of causal beliefs in weight stigma in order to better understand people's evaluations of individuals with obesity. Participants viewed weight-related information about a target individual and evaluated that target on various dimensions. Study 1 showed that offset effort information (i.e., information about effort to lose weight) had a greater impact on participants' evaluations of individuals with obesity than did other causal information, such as onset control and offset ability. Study 2 extended this finding by demonstrating that the duration of effort invested to lose weight is also important in determining participants' evaluations of individuals with obesity. Study 3 replicated the effect of effort (albeit in terms of effort to maintain a healthy lifestyle) on evaluations of individuals without obesity. Furthermore, in all 3 studies, disgust mediated the association between perceived effort and desire for social distance from the target. These findings highlight a key role for effort and disgust in weight stigma, and suggest that the negative evaluations of individuals with obesity might in part reflect a pro-effort bias. The present research has important implications for strategies to reduce weight stigma, and may even inform strategies to reduce social stigma beyond obesity, such as drug addiction.

Keywords: obesity, stigma, effort, control, disgust

The stigmatization of individuals with obesity is a pervasive sociocultural problem. In general terms, social stigma refers to an undesirable characteristic that indicates group membership and that leads to a distinction between "us" and "them" (Rüsch, Angermeyer, & Corrigan, 2005). These undesirable characteristics challenge the integrity of the person marked with the stigma, and can culminate in prejudice and discrimination (Corrigan, Kerr, & Knudsen, 2005). In the context of obesity, people who have the "undesirable characteristic" of excess weight experience bias and discrimination in a wide range of domains including education, employment, and health care (for a review, see Puhl & Heuer, 2009). Further, individuals with obesity are often stereotyped as lazy, sloppy, and low in core competencies such as self-discipline and motivation (Puhl & Brownell, 2001; Puhl & Heuer, 2009). The prevalence of weight stigma has increased in recent decades (Andreyeva, Puhl, & Brownell, 2008) and is now as common as experience with stigma based on race (Puhl, Andreyeva, & Brownell, 2008). Given the pervasiveness and negative impact of weight stigma in society, finding effective ways to reduce weight stigma should have widespread benefits for individuals with obesity in everyday life. In order to develop interventions that will be effective in reducing weight stigma, it is first important to understand the precise mechanisms underlying people's prejudice toward individuals with obesity.

Weight stigma has traditionally been explained by the widespread societal belief that body weight is under an individual's personal control (Crandall, 1994). This idea is consistent with Weiner's attribution theory of social stigma (Weiner, 1985, 2000; Weiner, Perry, & Magnusson, 1988), which proposes that the volitional control that one has over acquiring a stigmatizing condition (i.e., "onset control") influences people's responses toward that individual. In the domain of obesity, for example, Weiner's theory suggests that people's beliefs about the onset controllability of weight gain will influence their emotional reactions, which in turn, will influence their behavioral reactions toward individuals with obesity (i.e., the attribution-emotion-behavior link; Schwarzer & Weiner, 1991; Weiner, 1985, 1986). Weiner et al. (1988) tested this hypothesis by manipulating the perceived cause of obesity, portraying the condition as either onset-uncontrollable (i.e., originating from "glandular dysfunction") or onset-controllable (i.e., originating from "excessive eating without exercise"). Participants reported more anger, less pity, less liking, and less intention to help the targets when their obesity was described as resulting from a controllable cause compared to an uncontrollable cause. Other studies have also demonstrated that perceiving weight as controllable is associated with more negative stereotyping and stigma (Anesbury & Tiggemann, 2000; Crandall, 1994; DeJong, 1980; Jeong, 2007; Sikorski, Luppa, Brahler, Konig, & Riedel-Heller, 2012).

Building on this association between perceived controllability of weight and weight stigma, many past stigma-reduction efforts have focused on changing beliefs about the etiology and controllability of weight by describing the onset of obesity as uncontrollable (e.g., due to biological factors; Anesbury & Tiggemann, 2000; Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003). Across a wide range of studies, such interventions have effectively changed

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people's beliefs about the controllability of weight, but have typically failed to attenuate negative attitudes toward and stereotyping of target individuals (for a review, see Danielsdottir, O'Brien, & Ciao, 2010). One potential reason for the limited effectiveness of this type of manipulation is that perceived control over weight represents only one of the factors contributing to weight stigma, and that other beliefs are also (and potentially more) important. Identifying those additional factors could facilitate the development of more effective interventions aimed at reducing weight stigma.

Beyond Onset Controllability: A Role for Onset and Offset Beliefs

A number of modifications and extensions to attribution theory have been proposed that might provide a more in-depth account of how people evaluate individuals with obesity. For example, Brickman et al. (1982) suggested that it is important to distinguish between perceptions of onset control and offset control. *Onset control* refers to beliefs about the acquisition of a condition, whereas *offset control* assigns an independent role to the ability one has to overcome a condition after that condition has been acquired (Brickman et al., 1982).[1] In the domain of weight stigma, there is some indirect evidence that offset ability can play an important role in evaluations of individuals with obesity. For example, one study demonstrated that participants expressed greater dislike for a target with obesity that had recently lost weight compared to a target without obesity that had not lost weight (Blaine, DiBlasi, & Connor, 2002). The authors speculated that these greater dislike ratings emerged because the target's recent weight loss confirmed preexisting beliefs that individuals with obesity have the ability to lose weight. A similar study showed that exposure to information about weight loss (i.e., a before-and-after weight-loss advertisement) elicited more negative evaluations and greater perceptions of ease in the target's ability to control his or her own weight compared to information that did not convey any weight loss (i.e., "before" or "after" image only; Geier, Schwartz, & Brownell, 2003). Taken together, these studies suggest that perceptions of one's ability to overcome the problem of obesity by losing weight can play an important role in the negative attitudes toward and stereotyping of individuals with obesity.

Another causal belief that could play a key role in weight stigma is *offset effort*, which is conceptualized as the extent to which an individual is engaged in overcoming a particular problem by exerting personal effort (Karasawa, 1991). In a study examining responses to a student failing in school, Karasawa (1991) found that students who did not exert effort to improve their performance received more negative evaluations compared to students who did exert effort to improve. That study also found that the most negative evaluations occurred when the student exerted no effort to improve when he or she was able to improve his or her academic performance (i.e., the cause of poor performance was controllable). In the context of obesity, people typically assume that individuals with obesity invest less effort than individuals without obesity to lead a healthy lifestyle (e.g., are less likely to exercise, are more likely to eat junk food as a snack; Fardouly & Vartanian, 2012). Further, recent research indicates that perceived effort to lose weight can influence people's evaluations of individuals with obesity. For example, several studies on the stigma of weight-loss surgery have demonstrated that low-effort weight-loss methods (i.e., surgery) elicit more negative evaluations compared to high-effort weight-loss methods (i.e., diet and exercise; Fardouly & Vartanian, 2012; Mattingly, Stambush, & Hill, 2009; Vartanian & Fardouly, 2013, 2014).

Although the studies described above point to some useful extensions of attribution theory, they tend to examine each of these factors (onset control, offset ability, and offset effort) in isolation, leaving open the question of how these factors jointly influence evaluations of individuals with obesity. Black, Sokol, and Vartanian (2014) partially addressed this gap by examining how both offset ability and offset effort information impacted judgments of individuals with obesity. Participants viewed an image of a female target with obesity and were provided with key information about her offset ability and offset effort. Offset ability was manipulated by varying whether the medication that the individual was taking to treat a thyroid condition was effective (high ability) or not (low ability). Offset effort was manipulated by varying whether the individual was engaging in a healthy diet and regular exercise (high effort) or not (no effort). That study found that the no-effort targets were evaluated more negatively overall than were the high-effort targets, but also found that the target was evaluated most negatively if she had the ability to lose weight but did not put in any effort to do so. Black et al.'s (2014) study is informative, but is also limited because onset control information was held constant across all conditions (i.e., the onset cause of obesity was always perceived to be uncontrollable). This approach ignores the common societal belief that body weight is under personal control (Blaine & Williams, 2004; Crandall, 1994). Thus, including a manipulation of onset control could produce a more ecologically valid exploration of the causal beliefs that influence weight stigma.

A Role for Intergroup Emotions

The limited effectiveness of previous stigma reduction efforts has not only highlighted the importance of moving beyond a focus on onset control beliefs, but has also contributed to the emerging interest in intergroup emotions as an explanation for the negative attitudes toward individuals with obesity. Research on intergroup emotions has shown that emotions are integral to stereotyping, prejudice, and general interactions between different social groups (Iyer & Leach, 2009). In particular, disgust has been shown to play a major role in prejudice (Taylor, 2007). Disgust is a universal emotion that refers to a feeling of revulsion toward noxious objects or ideas (Oaten, Stevenson, & Case, 2009). Although intergroup emotion research on weight stigma is sparse, some initial work has suggested that disgust might be related to evaluations of individuals with obesity.

Neurological research initially implicated disgust in weight stigma by showing increased activation in brain regions associated with disgust, such as the insula and amygdala, when participants viewed images of targets with obesity (Krendl, Macrae, Kelley, Fugelsang, & Heatherton, 2006). Self-report data also indicated that obesity is associated with each of the three functional domains

[1] To enable clear differentiation between onset control and offset control, the latter will be referred to as "offset ability." The term "offset ability" more accurately describes the construct, which is the extent to which one is able to overcome a particular problem.

of disgust (i.e., pathogen, moral, and sexual; Lieberman, Tybur, & Latner, 2012, Study 1). Of these types of disgust, sexual disgust was rated highest of all, although this finding might be a function of the way that the questions were worded (Lieberman et al., 2012). Other research has examined the connection between disgust and prejudice toward individuals with obesity. For example, Vartanian (2010) found that disgust was a strong predictor of antifat attitudes and that disgust fully mediated the relationship between perceived weight controllability and antifat attitudes. Further, Vartanian, Thomas, and Vanman (2013) found that disgust was a stronger predictor of stereotyping of targets with obesity than were other negative intergroup emotions (i.e., anger and contempt). Because people reliably differentiated disgust from other negative emotions, these results suggest that disgust is experienced as a discrete emotion and therefore does not reflect a state of "general negativity" (Vartanian et al., 2013). Given the findings linking disgust to weight stigma, it would be important to determine whether causal beliefs about obesity also influence disgust reactions.

The Present Research

Previous research has demonstrated that perceptions of control over acquiring excess body weight are important predictors of negative attitudes toward individuals with obesity, but that changing perceptions of control is insufficient to reduce weight stigma. The present research aims to extend this research in two important ways: First, by investigating the role of other causal beliefs in evaluations of individuals with obesity (specifically, offset ability and offset effort); second, by examining how these causal beliefs influence people's disgust response toward individuals with obesity. Study 1 examined the joint influence of onset control, offset ability, and offset effort information on evaluations of targets with obesity. To further clarify the structure and role of offset effort, Study 2 investigated whether the duration of effort invested in weight-loss attempts also influences evaluations of targets with obesity, and Study 3 examined whether similar processes are at play in evaluations of a target without obesity.

Study 1

The primary aim of Study 1 was to examine how information about onset controllability, offset ability, and offset effort jointly affect evaluations of a target with obesity. Participants were given information about the causes of the target's initial weight gain (uncontrollable vs. controllable), about any barriers the target might be facing to lose weight (low vs. high ability), and about the amount of effort that the target is investing in losing weight (no vs. high effort). Participants then evaluated the target in terms of stereotypes, emotions, and behavioral intentions. Based on the work of Weiner and colleagues (e.g., Weiner, 1985; Weiner et al., 1988), we hypothesized that the onset-uncontrollable targets would be rated more positively than would the onset-controllable targets. We also hypothesized that the low-ability targets would be evaluated more positively compared to the high-ability targets (Blaine et al., 2002; Geier et al., 2003), and that the high-effort targets would be evaluated more positively compared to the no-effort targets (e.g., Mattingly et al., 2009; Fardouly & Vartanian, 2012). Drawing on the research by Karasawa (1991) and Black et al. (2014), we hypothesized that the effects of onset control, offset ability, and offset effort would be additive. Specifically, we predicted that the low-ability, high-effort target in the onset-uncontrollable condition would be evaluated most positively overall, and that the high-ability, no-effort target in the onset-controllable condition would be evaluated most negatively overall. Finally, following from the attribution-emotion-behavior link proposed by attribution theory, we hypothesized that emotional responses toward the target individual would mediate the relationship between causal beliefs and behavioral intentions.

Method

Participants. Four hundred and 53 participants based in the United States were recruited using the Amazon Mechanical Turk (MTurk) website. MTurk is an online data collection method that has been shown to produce data that is comparable in quality and reliability to traditional recruitment practices (e.g., Buhrmester, Kwang, & Gosling, 2011; Vartanian et al., 2013). Twenty-one participants' data were excluded from this study because they failed to respond correctly to at least three of the four comprehension check questions or to all four of the validity check questions. The final sample consisted of 432 participants (232 males, 200 females) with a mean age of 35.12 years (range = 18–79) and a mean body mass index (BMI; kg/m^2) of 26.86 (range = 16.14–58.24). The majority of the sample was Caucasian (81.9%), 6.7% were African American, 6.0% were Asian, 3.2% were Hispanic, 0.7% were American Indian, and 1.4% identified as "other." The demographic characteristics recorded did not vary by condition ($ps > .06$). This study was approved by the university's ethics committee.

Manipulation of causal beliefs. Causal beliefs were manipulated following the procedure used by Black et al. (2014). Participants viewed summary notes about a patient along with an image of that individual, and then read a transcript outlining an interaction between the patient and her doctor. All materials were pilot tested to ensure that the manipulations were conveyed effectively.[2]

Patient summary notes. The patient summary notes consisted of an image of a female patient named Emma, along with her demographic details (e.g., age), general health information (e.g., height, weight), a descriptive label for her body size (e.g., "BMI: 31.6 [Obese]"), and the doctor's overall evaluation of her weight (including onset and offset details). A female target was used in this study because our aim was to partially replicate Black et al.'s (2014) results, and also because other research on weight bias has found no differences in evaluations of male and female targets with obesity (e.g., Vartanian & Fardouly, 2013). To increase the generalizability of the findings, images of two different women sourced from weight-loss websites were used to convey the patient's body size. The specific image presented was counterbalanced across participants. Because image type did not have an effect on any of the dependent variables ($ps > .50$), all analyses reported below collapse across image type.

[2] Although the three independent variables were not completely independent (e.g., the offset effort manipulation had some impact on perceptions of control), each manipulation had a much greater impact on the specific belief of interest than on either of the other beliefs.

Doctor–patient transcripts. Written transcripts of approximately 1,000 words in length describing a routine check-up between a patient and her doctor were used to manipulate the independent variables of onset control, offset ability, and offset effort. In all conditions, the transcript outlined information about the patient's medical and family medical history, medications, dietary habits, and exercise routine. Based on the work of Weiner and colleagues (e.g., Weiner et al., 1988), the initial cause of obesity was described as being due to an underactive thyroid in the onset-uncontrollable conditions, and as being due to a lack of healthy diet and exercise in the onset-controllable conditions. In extension of Black et al.'s (2014) manipulation, offset ability was conceptualized in terms of the presence or absence of situational barriers that influence the ease with which a target individual is able to lose weight (i.e., access to resources and support from social networks). Low-ability targets were described as having insufficient financial resources to purchase healthy foods and a social network that did not support a healthy lifestyle; high-ability targets were described as having ample resources and a social network that did support a healthy lifestyle. Finally, as in previous studies (e.g., Black et al., 2014), offset effort was defined as the amount of effort invested in maintaining a healthy body weight through lifestyle choices. High effort was described as eating healthy meals, minimizing snack consumption, and engaging in regular exercise; no effort was described as eating unhealthy meals, frequently snacking, and leading a sedentary lifestyle.

Measures. After participants read the patient summary notes and doctor-patient transcript, they completed a range of self-report measures.

Comprehension and validity check questions. Four multiple-choice comprehension questions and four validity check questions were included to establish whether participants understood the transcript information and were engaged with the task. Participants were excluded from the subsequent data analyses if they did not answer at least three comprehension questions correctly and/or all of the validity check questions correctly.

Manipulation check questions. Perceived onset control was assessed by asking participants to indicate the extent to which they thought that the patient had personal control over, was responsible for, and was to blame for her initial weight gain (3 items; $\alpha = .97$). Perceived offset ability was assessed by asking participants to indicate the extent to which they thought that the patient was currently experiencing financial and social barriers that make it difficult for her to engage in healthy lifestyle behaviors (2 items; $\alpha = .94$). Finally, perceived offset effort was assessed by asking participants to indicate the extent to which the patient was currently putting in effort to lose weight through healthy lifestyle behaviors (2 items; $\alpha = .98$). All items were rated on a 7-point Likert scale (1 = *Strongly Disagree,* 7 = *Strongly Agree*).

Stereotypes. Participants rated the target individual on a series of common obesity stereotypes, including lazy, sloppy, self-disciplined (reverse-scored), motivated (reverse-scored), overindulgent, and having poor personal hygiene. Responses to these six items were averaged to compute a Negative Obesity Stereotypes (NOS) composite score ($\alpha = .91$). Participants also provided judgments of the target individual on a more general stereotype dimension relating to competence (i.e., competent, efficient, successful, and intelligent; $\alpha = .88$). For each item, participants used a visual analogue scale (anchored by 0 = *Not at all*, 100 = *Extremely*) to rate the extent to which they believed the characteristics applied to the target.

Emotions. Participants indicated the extent to which they felt disgust, anger, pity, and sympathy toward the target individual. Disgust was assessed because past weight stigma research has suggested that it is particularly relevant to obesity (e.g., Vartanian et al., 2013). Anger, pity, and sympathy were also assessed because they have typically been examined in past research on attributions (for a review, see Schmidt & Weiner, 1988). Each emotion was measured as a discrete item using a visual analogue scale (anchored by 0 = *Not at all*, 100 = *Extremely*).

Behavioral intentions. Participants completed the modified Social Distance Scale (SDS; Link, Cullen, Frank, & Wozniak, 1987; Penn et al., 1994), which was used as an index of willingness to approach or avoid the target. Participants were asked to indicate their willingness to engage in seven situations involving the target (e.g., "working on the same project as Emma") on a 4-point scale (1 = *Definitely willing*, 4 = *Definitely unwilling*). A social distance index was created by averaging responses to these items ($\alpha = .91$), with higher scores indicating a greater desire for social distance. Participants also responded to five questions about their willingness to provide social support for the target (e.g., "personally assisting or helping Emma with a small problem"). These responses were made on a visual analogue scale (anchored by 0 = *Not at all willing*, 100 = *Extremely willing*), and a social support index was computed by averaging responses to these five items ($\alpha = .95$).

Potential moderators and covariates. A number of individual difference measures were assessed as potential moderators and covariates because they have been shown in some past studies to influence evaluations of individuals with obesity. These included the Dislike ($\alpha_{dislike} = .90$) and Willpower ($\alpha_{willpower} = .79$) subscales of the Anti-Fat Attitudes Scale (AFA; Crandall, 1994), and participants' age, BMI, and own experience of weight-related teasing. Personal teasing history was assessed by asking participants to indicate whether or not they had ever been teased or bullied because of their weight (1 = *Yes*, 2 = *No*).

Procedure. Participants signed up for an online study that ostensibly examined doctor-patient interactions. Once informed consent was provided, participants were randomly assigned to one of eight experimental conditions. Participants viewed some summary notes about the patient written by the doctor, and read a transcript outlining an interaction between the doctor and the patient. After reading the transcript, participants completed the comprehension and manipulation checks. Participants then answered a range of self-report questions about the patient, completed the AFA scale and, finally, provided demographic details including their age, gender, ethnicity, and height and weight (used to calculate BMI).

Statistical analyses. Data were screened for statistical outliers (scores on key variables ± 3 *SD* from the mean), resulting in 20 participants being excluded from the analyses below (including those outliers did not change the pattern of results). One-way analyses of variance (ANOVAs) were used to assess the effectiveness of the onset and offset manipulations. Next, a series of 2 (controllability: onset-uncontrollable vs. onset-controllable) × 2 (ability: low-ability vs. high-ability) × 2 (effort: no-effort vs. high-effort) ANOVAs were performed to examine the joint effects of the onset and offset information on each dependent variable.

Due to the large number of analyses undertaken, a Bonferroni correction method was used to control the familywise error rate (FWER) at $\alpha = .006$ (.05/8 dependent variables). Mediation analyses were then conducted following the bootstrapping procedure outlined by Preacher and Hayes (2008) in order to clarify the link between causal beliefs, emotions, and behaviors proposed by Weiner's attribution theory. None of the proposed moderators interacted with the manipulated variables and thus they were not included in the analyses described below. Similarly, controlling for these variables did not impact on the results and thus they were not included as covariates in the analyses described below.

Results

Manipulation checks. The onset control, offset ability, and offset effort manipulations were all effective. Participants perceived the onset-uncontrollable targets ($M = 2.57$, $SD = 1.41$) as having less personal control over their weight compared to the onset-controllable targets ($M = 6.06$, $SD = 0.78$), $F(1, 410) = 954.22$, $p < .001$, $\eta_p^2 = .70$. Participants also perceived the high-ability targets ($M = 1.10$, $SD = 0.77$) as experiencing fewer environmental barriers to weight loss compared to the low-ability targets ($M = 5.44$, $SD = 1.00$), $F(1, 410) = 2465.62$, $p < .001$, $\eta_p^2 = .86$. Finally, participants perceived the no-effort targets ($M = 1.65$, $SD = 0.94$) as investing less effort to lose weight compared to the high-effort targets ($M = 6.29$, $SD = 0.77$), $F(1, 410) = 3019.52$, $p < .001$, $\eta_p^2 = .88$.

Negative obesity stereotypes. Consistent with the hypotheses, there was a significant main effect of onset control, $F(1, 404) = 63.39$, $p < .001$, $\eta_p^2 = .14$, such that the onset-uncontrollable targets ($M = 36.37$, $SD = 26.46$) were stereotyped less negatively than were the onset-controllable targets ($M = 48.86$, $SD = 21.42$). There was also a significant main effect of effort, $F(1, 404) = 728.28$, $p < .001$, $\eta_p^2 = .64$, such that the high-effort targets ($M = 23.63$, $SD = 16.92$) were stereotyped less negatively than were the no-effort targets ($M = 62.23$, $SD = 14.26$). The main effect of effort was qualified by a significant Effort × Controllability interaction, $F(1, 404) = 17.15$, $p < .001$, $\eta_p^2 = .04$. Follow-up simple effect analyses revealed that, in the high-effort condition, the onset-uncontrollable targets ($M = 15.39$, $SD = 14.61$) were stereotyped less negatively than were the onset-controllable targets ($M = 32.51$, $SD = 14.62$; $p < .001$, $\eta_p^2 = .16$); similarly, in the no-effort condition, the onset-uncontrollable targets ($M = 59.47$, $SD = 14.65$) were stereotyped less negatively than were the onset-controllable targets ($M = 64.89$, $SD = 13.41$; $p = .01$, $\eta_p^2 = .02$), but this difference was smaller than it was in the high-effort condition. No other effects were significant for NOS ($ps > .33$).

Competence. For competence, there was a significant main effect of ability, $F(1, 404) = 9.89$, $p = .002$, $\eta_p^2 = .02$, such that participants perceived the high-ability targets ($M = 60.17$, $SD = 17.53$) to be more competent than the low-ability targets ($M = 55.35$, $SD = 19.75$). There was also a significant main effect of effort, $F(1, 404) = 174.96$, $p < .001$, $\eta_p^2 = .30$, such that participants perceived the high-effort targets ($M = 67.75$, $SD = 14.81$) to be more competent than the no-effort targets ($M = 47.40$, $SD = 16.81$). No other main or interaction effects were significant for competence ($ps > .008$).

Emotional responses. Consistent with the hypotheses, there was a significant main effect of effort for disgust, $F(1, 404) = 16.68$, $p < .001$, $\eta_p^2 = .04$, such that targets in the high-effort condition ($M = 11.48$, $SD = 16.45$) elicited less disgust compared to targets in the no-effort condition ($M = 19.82$, $SD = 23.83$). There was also a significant main effect of effort for anger, $F(1, 404) = 10.29$, $p = .001$, $\eta_p^2 = .03$, such that the high-effort targets ($M = 7.14$, $SD = 12.11$) elicited less anger compared to the no-effort targets ($M = 11.79$, $SD = 16.97$). For ratings of pity, the main effect of ability was significant, $F(1, 404) = 12.23$, $p = .001$, $\eta_p^2 = .03$, such that targets in the low-ability condition ($M = 40.12$, $SD = 27.96$) elicited more pity compared to targets in the high-ability condition ($M = 30.76$, $SD = 25.66$). Finally, for ratings of sympathy, there was a significant main effect of effort, $F(1, 404) = 22.02$, $p < .001$, $\eta_p^2 = .05$, such that the high-effort targets ($M = 58.96$, $SD = 26.48$) elicited more sympathy compared to the no-effort targets ($M = 46.23$, $SD = 28.59$). The main effect of effort was qualified by a significant Effort × Controllability interaction, $F(1, 404) = 8.08$, $p = .005$, $\eta_p^2 = .02$. Follow-up simple effect analyses indicated that, in the high-effort condition, onset-uncontrollable targets ($M = 65.54$, $SD = 24.08$) elicited more sympathy compared to the onset-controllable targets ($M = 51.86$, $SD = 27.22$; $p < .001$, $\eta_p^2 = .03$); in the no-effort condition, in contrast, there was no difference in sympathy ratings between the onset-uncontrollable ($M = 45.46$, $SD = 27.62$) and onset-controllable targets ($M = 46.97$, $SD = 29.60$; $p = .71$, $\eta_p^2 < .001$). No other main effects or interaction effects were significant for the emotion measures ($ps > .01$).

Behavioral intentions. In line with the hypotheses, there was a significant main effect of effort for social distance, $F(1, 404) = 16.38$, $p < .001$, $\eta_p^2 = .04$, such that participants expressed less of a desire for social distance from targets in the high-effort condition ($M = 1.68$, $SD = 0.52$) compared to targets in the no-effort condition ($M = 1.91$, $SD = 0.64$). For social support, there a main effect of control, $F(1, 404) = 7.83$, $p = .005$, $\eta_p^2 = .02$, such that participants expressed a greater desire to help targets in the uncontrollable condition ($M = 75.95$, $SD = 19.43$) compared to targets in the controllable condition ($M = 70.12$, $SD = 22.25$). No other main effects or interaction effects were significant for social distance or for social support ($ps > .01$).

Mediation analysis. Offset effort had a significant impact on three emotions (disgust, anger, and sympathy) and also on social distance intentions. Furthermore, each of those three emotions was significantly correlated with social distance ($\|rs\| > .25$, $ps < .001$). Therefore, a multiple mediation analysis was conducted to determine whether there were indirect effects of offset effort on participants' desire for social distance from the target via disgust, anger, and sympathy. The indirect effects for all three emotions were significant (disgust: point estimate = −0.06, $SE = 0.02$, 95% confidence interval (CI) [−0.11, −0.02]; anger: point estimate = −0.04, $SE = 0.02$, 95% CI [−0.08, −0.01]; sympathy: point estimate = −0.05, $SE = 0.02$, 95% CI [−0.09, −0.02]). There were no significant contrasts among the mediators, indicating that the strength of the indirect effect was similar for each emotion. Finally, the direct effect of effort on social distance was no longer significant ($p = .08$).

Discussion

Study 1 found that, although onset control and offset ability did influence some outcomes (e.g., NOS, pity, and social support intention), offset effort had the most consistent effect on participants' evaluations of individuals with obesity and the effect sizes for effort were also generally larger than were those for either onset control and offset ability. Specifically, the high-effort targets were stereotyped less negatively, were perceived as more competent, and elicited less disgust, less anger, and more sympathy than did the no-effort targets. Participants also expressed less desire for social distance from the high-effort targets than from the no-effort targets. These findings extend previous research (Black et al., 2014; Fardouly & Vartanian, 2012; Mattingly et al., 2009) by highlighting the importance of offset effort in the stereotyping of, emotional reactions to, and behavioral intentions toward individuals with obesity. Although there was very little evidence for the types of additive effects proposed by Karasawa (1991) and Black et al. (2014), the results of Study 1 suggest that when information about a lack of effort was available, that information increased negative evaluations of the target irrespective of the other causal information available (i.e., onset control and offset ability). When information about high effort was available, however, onset control and offset ability information became more influential in determining evaluations of that target. This pattern is consistent with recent research indicating that, unless other relevant information is provided, obesity can act as a "diffuse status cue" that guides stereotyping (Vartanian & Silverstein, 2013). Finally, as predicted, we found evidence that emotional responses (i.e., disgust, anger, and sympathy) mediated the effect of offset effort on social distance intentions.

Offset effort appears to be an important component of evaluations of individuals with obesity. What is less clear, however, is whether the duration of effort over time also contributes to the formation of attitudes, stereotyping, and behavioral intentions toward individuals with obesity. Study 1 did not specify a time period over which the targets had been expending effort; participants were only informed about whether or not the targets were *currently* investing effort to lose weight. According to Weiner et al. (1988), the stability of a cause over time can also affect emotional and behavioral reactions toward a negative outcome. In the context of offset effort for obesity, stability might refer to the temporal distinction between short-term and long-term effort to lose weight (Weiner, 1985). Short-term effort should elicit less positive emotions and intentions (e.g., greater disgust and neglect) compared to long-term effort (Weiner, 1985). These predictions were examined in Study 2.

Study 2

The aim of Study 2 was to gain further insight into the structure and role of offset effort in evaluations of individuals with obesity by examining whether the temporal stability of effort (i.e., the "duration" of effort) to lose weight influences those evaluations. Participants read information about a target individual who did not put in any effort to lose weight, who only recently started putting in effort to lose weight, or who had been putting in effort to lose weight over an extended period. Following from the results of Study 1, we hypothesized that the targets described as exerting effort to lose weight would be evaluated more positively compared to the targets described as not exerting any effort to lose weight. Drawing from the predictions of attribution theory concerning the stability dimension (Weiner, 2000), we also hypothesized that the targets described as investing consistent effort over the last few years (i.e., long-term effort) would be evaluated more positively compared to the targets described as only recently investing effort to lose weight (i.e., short-term effort). Finally, we hypothesized that emotional reactions would mediate the relationship between offset effort stability and behavioral intentions.

Method

Participants. Two hundred and two participants based in the United States were recruited online using MTurk. Thirty-one participants' data were excluded from the subsequent analyses because they failed to respond correctly to at least three of the four comprehension check questions or to all four of the validity check questions, or had already participated in Study 1. The final sample consisted of 171 participants (97 males, 74 females), with a mean age of 33.67 years (range = 18–73) and a mean BMI of 26.30 (range = 17.75–61.65). The majority of the sample was Caucasian (77.8%), 9.4% were African American, 6.4% were Hispanic, 2.9% were Asian, 0.6% were American Indian, and 2.9% identified as "other." Demographic variables did not vary as a function of condition ($ps > .11$). This study was approved by the university's ethics committee.

Experimental manipulations. As in Study 1, participants read summary notes about a patient, as well as a summary of a conversation between the patient and the doctor during a general check-up. Unlike Study 1, however, the summary notes did not provide a visual image to convey the target's body size, nor did they provide the descriptive label "Obese" or the patient's current weight. The patient's current weight status was purposely left ambiguous so that we could assess how effort information influences perceptions about weight. Note that each target's height was provided in the patient summary notes so that perceived BMI could be calculated (described in more detail below). To increase the generalizability of our findings, both male and female targets were included. Based on the results of similar studies (e.g., Vartanian & Fardouly, 2013), however, the effects of effort stability were not predicted to differ as a function of gender. Across all conditions, the conversation between the patient and the doctor conveyed that the patient had been experiencing ongoing weight issues throughout his or her life, and included specific details about his or her diet and exercise patterns over time.

The primary manipulation involved information about offset effort stability. The no-effort targets were described as following an unhealthy diet and sedentary lifestyle over the past few years, and also as failing to engage in more recent attempts to improve their lifestyle habits. The short-term effort targets were described as putting in no effort to lose weight over the past few years, but as undergoing more recent diet and exercise changes to achieve a healthier lifestyle. The long-term effort targets were described as successfully adhering to a healthy diet and exercise regime over the past few years, and also as continuing those healthy lifestyle behaviors in the present. The experimental manipulations were pilot tested with an online sample to ensure that the effort stability information was conveyed effectively.

Measures and procedure. Participants were randomly assigned to either the no-effort condition, the short-term effort condition, or the long-term effort condition. As a manipulation check, participants indicated their level of agreement with the following statement: "The patient has been putting in long-term effort over the last few years to lose weight by engaging in healthier diet and exercise habits." This item was rated on a 7-point Likert scale (1 = *Strongly Disagree,* 7 = *Strongly Agree*). Because no weight-related information was provided across all conditions, two additional manipulation check questions asked participants to estimate the target's current weight (i.e., "how much do you think the patient currently weighs in pounds?") and categorical weight status (i.e., "which of the following categories do you think would most accurately describe the patient's current weight status"; 1 = "underweight", "2 = normal-weight", 3 = "overweight", 4 = "obese"). Perceived target BMI was calculated from the target's height (which was provided in the initial summary information) and participants' estimate of the target's weight in pounds. Participants also completed the same measures as in Study 1: NOS (α = .93), competence (α = .90), single item measures of emotion (disgust, anger, pity, and sympathy), the SDS (α = .89), and an index of social support (α = .92).

Statistical analyses. Data were screened for statistical outliers, resulting in 8 participants being excluded from the analyses. As in Study 1, including the outliers did not change the pattern of results. A one-way ANOVA was used to test the effectiveness of the offset effort stability manipulations. Next, a series of 3 (offset effort stability: no-effort vs. short-term vs. long-term) × 2 (target gender: male vs. female) ANOVAs were conducted to determine whether the effect of effort information on each dependent variable differed as a function of target gender. The statistical significance of all results were evaluated using a significance level that controlled the FWER at α = .006 (.05/8 dependent variables). Because there were no interactions involving target gender, data are only presented for the effort stability manipulation (see Table 1 for the means and standard deviations). Mediation analyses were then conducted to determine whether the effects of effort stability on behavioral intentions were mediated by emotional responses. As in Study 1, the Dislike (α = .88) and Willpower (α = .81) subscales of the AFA questionnaire, and participants' age, BMI, and previous exposure to teasing due to one's weight status did not interact with the manipulated variables, and controlling for these variables did not impact the results. These variables were therefore not included as moderators or covariates in the analyses described below.

Table 1
Means (SDs) for Ratings of the Target Individual by Effort Stability Condition in Study 2

Dependent variable	No effort	Short-term effort	Long-term effort
NOS	63.33_{a} (16.77)	36.38_{b} (18.41)	14.38_{c} (15.38)
Competence	45.76_{a} (15.56)	55.39_{b} (18.76)	72.52_{c} (17.11)
Disgust	22.40_{a} (24.32)	$16.41_{a,b}$ (20.86)	8.59_{b} (17.06)
Anger	12.40_{a} (18.01)	10.52_{a} (15.08)	6.41_{a} (14.06)
Pity	42.51_{a} (26.92)	33.15_{a} (27.52)	27.48_{a} (29.96)
Sympathy	48.96_{a} (26.02)	48.22_{a} (32.19)	54.64_{a} (30.26)
Social distance[a]	0.93_{a} (0.56)	0.90_{a} (0.60)	0.70_{a} (0.58)
Social support	75.29_{a} (19.89)	72.01_{a} (20.24)	75.93_{a} (18.59)

Note. For each dependent variable, means within a row with a different subscript denote significant pairwise differences between effort stability conditions at $p < .006$. NOS = Negative Obesity Stereotypes.
[a] For social distance, the difference between no-effort and long-term effort was significant at $p = .04$.

Results

Manipulation checks. A one-way ANOVA confirmed the effectiveness of the offset effort stability manipulation, $F(2, 160) = 324.96$, $p < .001$, $\eta_p^2 = .80$. Follow-up comparisons showed that participants rated the no-effort targets ($M = 1.43$, $SD = 0.77$) as exerting less long-term effort than they did both the short-term effort targets ($M = 2.50$, $SD = 1.61$; $p < .001$) and the long-term effort targets ($M = 6.52$, $SD = 0.69$; $p < .001$). Further, the short-term effort targets were rated as exerting less long-term effort than were the long-term effort targets, $p < .001$.

The long-term effort group was perceived as having a lower weight ($M = 195.50$, $SD = 47.74$) than both the short-term effort ($M = 217.78$, $SD = 50.90$) and the no-effort ($M = 228.51$, $SD = 50.67$) groups ($ps < .002$). Despite these group differences, the perceived weight places all targets' BMI in the obese range (i.e., BMI > 30) and 92% of participants classified the targets' weight as being overweight or obese. Further, controlling for participants' estimates of the target's current weight did not impact any effects of condition on the dependent variables.

Negative obesity stereotypes. The overall test of condition was significant for NOS, $F(2, 157) = 115.77$, $p < .001$, $\eta_p^2 = .60$. Consistent with the hypotheses, follow-up pairwise comparisons revealed that participants stereotyped both the short-term effort targets ($p < .001$) and the long-term effort targets ($p < .001$) less negatively than they did the no-effort targets. In addition, participants stereotyped the long-term effort targets less negatively than they did the short-term effort targets, $p < .001$.

Competence. For competence ratings, the overall test of effort stability condition was significant, $F(2, 157) = 33.41$, $p < .001$, $\eta_p^2 = .30$. In support of the hypotheses, follow-up pairwise comparisons indicated that participants perceived both the short-term effort targets ($p = .004$) and the long-term effort targets ($p < .001$) as being more competent than the no-effort targets. Participants also perceived the long-term effort targets as being more competent than the short-term effort targets, $p < .001$.

Emotional responses. In line with the hypotheses, the overall effect of condition was significant for disgust, $F(2, 157) = 5.83$, $p = .004$, $\eta_p^2 = .07$. Follow-up pairwise comparisons showed that the long-term effort targets evoked less disgust than did the no-effort targets ($p = .001$). There were no significant pairwise comparisons for no-effort versus short-term effort ($p = .16$) or for short-term effort versus long-term effort ($p = .05$). There were no significant main effects for anger, pity, or sympathy, $ps > .01$.

Behavioral intentions. In contrast to the hypotheses, the overall effect of offset effort stability on social distance was not significant, $F(2, 157) = 2.48$, $p = .09$, $\eta_p^2 = .03$. A trend was observed between the no-effort and long-term effort targets for social distance, however, such that participants expressed less desire for social distance from the long-term effort targets compared to the no-effort targets ($p = .04$). Although this difference was not statistically significant based on our conservative alpha cut-off, the effect was in the expected direction and replicates the

pattern observed in Study 1. There was no significant overall effect of effort stability for social support ($p = .58$).

Mediation analysis. Mediation analysis was conducted to determine whether participants' self-reported disgust mediated the link between effort stability condition and social distance intentions. Because the only significant pairwise difference for disgust (and, to a certain extent, social distance) was found between the no-effort and long-term effort conditions, only those conditions were included in the mediation analysis. The indirect path from effort to social distance through disgust was significant, indicating that participants' disgust reactions mediated the link between effort stability and social distance intentions (point estimate = −0.15, $SE = 0.06$, 95% CI [−0.29, −0.06]). When disgust was included as a mediator, the direct effect of effort on social distance was not significant ($p = .45$).

Discussion

Study 2 provided a focused investigation into the role of offset effort in people's evaluations of individuals with obesity. The short-term effort targets were stereotyped less negatively than were the no-effort targets, but the most consistent differences were between the no-effort and long-term effort conditions. The long-term effort targets were stereotyped less negatively, were perceived to be more competent, and elicited less disgust than the no-effort targets. Furthermore, consistent with the finding of Study 1, disgust mediated the effect of effort stability on social distance intentions. These findings suggest that it is not simply the presence or absence of effort to lose weight that influences evaluations of individuals with obesity, but also the stability of that effort over time.

It is noteworthy that the effects of effort stability emerged even in the absence of a visual image or specific weight-related information about the target. Furthermore, the observed effects remained even when controlling for estimations of the targets' current weight. The fact that the effects of effort persisted over and above perceived target weight suggests that stigmatized reactions to individuals with obesity might be as much related to their effort expenditure as to their actual body weight. If effort information does influence evaluations of target individuals independent of body weight, then effort to maintain a healthy lifestyle should also influence perceptions of individuals without obesity. This idea suggests that the causal beliefs (e.g., effort) that influence how people judge and respond to individuals with obesity can themselves be important, independent of the outcomes (e.g., body weight and weight loss).

Study 3

Study 3 tested the hypothesis that a target without obesity who invested a high amount of effort to maintain a healthy lifestyle would be evaluated more positively than would a target without obesity who invested no effort to maintain a healthy lifestyle.

Method

Participants. Two hundred participants based in the United States were recruited online using MTurk. Forty-nine participants' data were excluded from the subsequent analyses because they failed to respond correctly to one of the three comprehension check questions or one of the three validity check questions, or had already participated in Studies 1 or 2. The final sample consisted of 151 participants (67 males, 84 females), with a mean age of 35.44 years (range = 19–69) and a mean BMI of 26.84 (range = 18.35–57.27). The majority of the sample was Caucasian (77.5%), 6.6% were African American, 4.6% were Hispanic, 7.3% were Asian, 1.3% were American Indian, and 2.6% identified as "other." Demographic variables did not vary by condition ($ps > .14$). This study was approved by the university's ethics committee.

Measures and procedure. Participants were randomly assigned to either the no-effort condition or to the high-effort condition. In order to address the aims of Study 3, the manipulations used in Study 2 were modified in two key ways. First, prior to reading the written effort information, participants were presented with an image of a female target without obesity, the descriptive label "normal-weight" and the target's current weight (137 pounds).[3] Second, the effort manipulations were reframed to emphasize the target's effort to maintain a healthy lifestyle rather than effort to lose weight. This modification was necessary to separate the effort component from the weight-loss component. The measures and the remainder of the procedure were identical to that of Study 2.

Statistical analyses. Prior to conducting the analyses, data were screened for outliers, resulting in 13 participants being excluded from the analyses reported below. As in Studies 1 and 2, the pattern of results did not change if those outliers were included. One-way ANOVAs were used to test the effectiveness of the effort manipulations, and to test the effect of effort information on each of the dependent variables. Mediation analyses were then conducted to determine whether the effects of effort on behavioral intentions were mediated by emotional responses. The statistical significance of all results were evaluated at $\alpha = .006$ (.05/8 dependent variables).

Results

Manipulation checks. A one-way ANOVA confirmed the effectiveness of the effort manipulation, $F(1, 136) = 970.84$, $p < .001$, $\eta_p^2 = .88$. Participants rated the no-effort target ($M = 1.84$, $SD = 0.92$) as exerting less effort than they did the high-effort target ($M = 6.38$, $SD = 0.79$).

Main analyses. Means for the main dependent variables are shown in Table 2. Compared to the no-effort target, the high-effort target was stereotyped less negatively ($F(1, 136) = 293.03$, $p < .001$, $\eta_p^2 = .68$); was perceived as more competent ($F(1, 136) = 78.56$, $p < .001$, $\eta_p^2 = .37$); and evoked less disgust ($F(1, 136) = 7.82$, $p = .006$, $\eta_p^2 = .05$), less pity ($F(1, 136) = 21.04$, $p < .001$, $\eta_p^2 = .13$), and less sympathy ($F(1, 136) = 7.68$, $p = .006$, $\eta_p^2 = .05$), but not more anger ($F(1, 136) = 2.54$, $p = .11$, $\eta_p^2 = .02$). Participants also expressed somewhat less of a desire for social distance from the high-effort target than from the no-effort target ($F(1, 136) = 5.16$, $p = .03$, $\eta_p^2 = .04$), but there was no difference for social support ($F(1, 144) = 1.54$, $p = .22$, $\eta_p^2 = .01$).

[3] Only images of a female target were included because the results of Study 2 indicated that evaluations of individuals with obesity did not differ as a function of the target's gender (see also Vartanian & Fardouly, 2013).

Table 2
Means (SDs) for Ratings of the Target Individual by Effort Condition in Study 3

Dependent variable	No effort	High effort
NOS	45.60_a (14.89)	10.23_b (8.53)
Competence	60.63_a (15.75)	81.15_b (11.03)
Disgust	7.86_a (12.81)	2.99_b (6.73)
Anger	5.80_a (9.55)	3.52_a (7.02)
Pity	18.22_a (18.61)	6.19_b (11.33)
Sympathy	43.99_a (26.58)	30.17_b (31.73)
Social distance[a]	1.81_a (0.52)	1.63_a (0.40)
Social support	67.93_a (14.18)	71.06_a (15.43)

Note. For each dependent variable, means within a row with a different subscript denote significant pairwise differences between effort stability conditions at $p < .006$. NOS = Negative Obesity Stereotypes.
[a] For social distance, the difference between no-effort and long-term effort was significant at $p = .03$.

Mediation analysis. A multiple mediation analysis was conducted to determine whether participants' self-reported disgust, pity, and sympathy mediated the link between effort condition and social distance intentions. The indirect effect was significant for disgust (point estimate = −0.09, *SE* = 0.04, 95% CI [−0.19, −0.03]), but not for pity (point estimate = 0.05, *SE* = 0.03, 95% CI [−0.01, 0.14]) or for sympathy (point estimate = 0.02, *SE* = 0.02, 95% CI [−0.01, 0.08]). Finally, the direct effect of effort on social distance was still significant ($p = .04$).

Discussion

Study 3 replicated the pattern of results found in Studies 1 and 2 using targets without obesity, and using an effort manipulation that focused on maintaining a healthy lifestyle rather than losing weight. As in Studies 1 and 2, participants evaluated the high-effort targets more positively than they did the no-effort targets. Compared to the no-effort targets, the high-effort targets were stereotyped less negatively, were perceived to be more competent, and elicited less disgust, pity, and sympathy. Further, participants expressed less desire for social distance from the high-effort targets compared to the no-effort targets. Also replicating the findings of Studies 1 and 2, Study 3 showed that disgust mediated the effect of effort on participants' desire for social distance from the target individual. These findings support the hypothesis that the benefits of effort also apply to individuals without obesity who are trying to maintain a healthy lifestyle rather than trying to lose weight.

General Discussion

The overall aim of the present research was to provide a more in-depth account of negative evaluations of individuals with obesity by moving beyond beliefs about the onset controllability of body weight. Study 1 showed that participants used offset effort information to a greater extent than they used onset control and offset ability information in their evaluations of individuals with obesity, evaluating most positively those individuals who invested effort to lose weight. These results suggest that people believe that individuals with obesity should be *trying* to lose weight, regardless of the causes of their weight problem or the situational barriers that might make it difficult for them to lose weight. Study 2 extended these findings by demonstrating that it is long-term effort, in particular, that has positive effects for evaluations of the target individuals. Past studies have found that individuals with obesity who lose weight through effortful means (i.e., dieting and exercise, as opposed to surgery) were evaluated more favorably (e.g., Fardouly & Vartanian, 2012; Vartanian & Fardouly, 2014), and the present research showed that investing effort to lose weight leads to more favorable evaluations even though the target was still currently obese and there was no mention of any weight loss. Furthermore, the preference for effort (over a lack of effort) persisted when details regarding the target's current weight were omitted entirely (Study 2), and also when the target was explicitly described as being of normal weight (Study 3). These results suggest that the stigmatization of individuals with obesity is influenced by perceptions about their effort to lose weight, and that this stigma might in part reflect a "pro-effort bias" (or an "anti no-effort bias"). This idea of a pro-effort bias is consistent with research in other domains that has shown that students who try hard in academia are liked and admired more than students who do not try, even when those students who try fail (Weiner & Kukla, 1970).

An alternative explanation may account for the persistence of a pro-effort bias even when offset effort was not explicitly associated with any weight loss (i.e., Study 2). It is possible that participants assumed that the targets in the high-effort and long-term effort conditions had lost weight (i.e., that they were previously heavier than they are currently), and that this assumed weight loss was partly responsible for the observed effects. If participants were making assumptions about weight loss, this may have negative implications for individuals with obesity who put in consistent effort to engage in a healthy lifestyle but who fail to lose weight because this could reinforce negative obesity stereotypes and antifat attitudes. Note, however, that the effects of effort were observed for the targets without obesity even though the effort manipulation was framed in terms of a healthy lifestyle instead of weight loss.

In addition to examining effort as an important causal belief, the present research extended previous weight stigma research by measuring disgust responses (in addition to anger, pity, and sympathy). Targets who invested effort to lose weight or lead a healthy lifestyle evoked less disgust compared to targets who did not invest effort to lose weight or lead a healthy lifestyle. These results are important because previous research has suggested that disgust is resistant to changes in contextual circumstances and cues (e.g., Russell & Giner-Sorolla, 2011a, 2011b). Our results indicate that, at least in some cases, disgust responses can be attenuated by providing contextual information. The capacity of (high or long-term) effort information to influence disgust in the context of weight stigma may occur because it challenges preexisting beliefs about obesity (e.g., laziness). This explanation is consistent with research indicating that disgust is a moral emotion, which can be elicited when immoral behaviors (i.e., a lack of effort) are perceived to be intentional (Hutcherson & Gross, 2011; Rozin, 1999). For example, because Western society's preference for lean bodies represents a moral value (e.g., Hoverd & Sibley, 2007; Townend, 2009; Webb, 2009), those who intentionally violate expectations of thinness by failing to invest effort to lose weight may elicit moral disgust (Vartanian, 2010).

Across all three studies, we also found that disgust emerged as the most consistent emotion associated with effort and with behavioral intentions (desire for social distance). Furthermore, disgust consistently mediated the link between effort and desire for social distance, such that participants intended to avoid no-effort targets, at least to some extent, because those targets elicited greater disgust. These results support the emerging idea that disgust plays a key role in weight stigma. The sociofunctionalist model of moral emotion (Hutcherson & Gross, 2011) provides one explanation for why disgust may be more relevant to obesity than are other emotions, such as anger. Anger is an approach/attack emotion that occurs in response to transgressions that violate one's rights or that directly impact the self (Hutcherson & Gross, 2011; Rozin, 1999). Because individuals with obesity do not typically pose an immediate threat to others or violate the rights of others, anger should not be strongly associated with obesity. This prediction is consistent with the present research, which showed that the effect of effort information on anger was relatively weak (Study 1) or was nonsignificant (Studies 2 and 3). In contrast to anger, disgust is an avoidance/withdrawal emotion that is elicited when a person's intentions and character are perceived as immoral (Hutcherson & Gross, 2011). Because individuals' efforts (or lack thereof) to lose weight can be seen as a type of intentional moral behavior, the sociofunctionalist model would predict that disgust would be strongly associated with obesity (Hutcherson & Gross, 2011; Rozin, 1999; Weiner, 2006). It is of course possible that, in some contexts, individuals with obesity could be considered a threat, such as when focusing on the health care costs associated with obesity that place a financial burden on society as a whole. In these contexts, anger may also be evoked toward individuals with obesity (e.g., Vartanian et al., 2013).

Practical Implications

The results of the present research suggest that interventions aiming to reduce weight stigma may benefit from including offset effort information. Specifically, these interventions should aim to reduce popular misconceptions about individuals with obesity and promote the knowledge that they do often invest effort to lose weight. This suggestion is consistent with research showing that individuals with obesity who engage in nonstereotypical activities (e.g., shopping for fresh vegetables) are perceived less negatively than are those who engage in stereotypical activities (Carels et al., 2013; McClure, Puhl, & Heuer, 2011; Pearl, Puhl, & Brownell, 2012), presumably because the nonstereotypical portrayals convey that some individuals with obesity are in fact trying to adopt healthier lifestyle choices. It would also be important for stigma reduction efforts to convey that weight-loss attempts through healthy diet and regular exercise are not always successful, and that healthy lifestyle habits improve quality of life irrespective of their effects on body weight. These approaches could potentially challenge preexisting negative obesity stereotypes by emphasizing the diligence required to maintain healthy behaviors, reduce disgust reactions to individuals with obesity by conveying moral fortitude rather than weakness, and reduce the desire for social distance and other forms of prejudice. Implementing these types of interventions through educational programs earlier in development could be particularly effective (see Anesbury & Tiggemann, 2000); young children may be more responsive to interventions that focus on effort information than adult populations, because their beliefs about obesity are still evolving and may be more susceptible to change.

The present research can also have implications for other social stigma beyond weight stigma. For example, drug addiction is one social stigma that may show similar effects of offset effort and disgust. In a comparison of a range of social stigma, both Weiner et al. (1988) and Vartanian (2010) showed that people with drug addiction were perceived more negatively than were people with obesity, and were viewed as having more personal control over their condition than were people with obesity. Furthermore, Vartanian (2010) found that drug addiction elicited more disgust than did obesity. Extending the present findings to people with drug addiction, we would predict that perceptions of an individual's efforts to overcome his or her addiction would be related to evaluations of and prejudice toward that individual. In particular, an individual who is actively investing effort to overcome his or her addiction would be stereotyped less negatively, would elicit less disgust, and would evoke less desire for social distance (and perhaps a greater desire to provide help). Although future research is needed to confirm the applicability of our findings to other social stigma, evidence to that effect would suggest a broad stigma-reduction framework with the potential to reduce stigma across a range of social domains.

Limitations

The primary limitations of the current research are that participants evaluated target individuals in fairly artificial contexts (i.e., vignette based), and that self-reported intentions were used as indices of avoidance and helping behavior. Thus, it remains unknown whether people would draw on offset effort information (or other causal information) when evaluating individuals with obesity during a real face-to-face interaction. Further, because the mechanisms underlying intentions and actual behaviors may not be equivalent (Meyer & Mulherin, 1980), the causal factors that influence intentions as reported in the present study may not affect actual behaviors in the same way. Future research should test the effects of effort information and emotional reactions in more ecologically valid contexts (including face-to-face interactions with individuals with obesity). The study sample was also limited in terms of racial and ethnic diversity, and no information was collected about participants' weight-loss histories, self-perceived weight status (e.g., "obese" or "overweight"), or body image concerns (e.g., fear of weight gain). Perceived weight status and body image concerns are important variables to consider because they are strong predictors of subjective experiences of weight stigma and antifat attitudes (e.g., Holub, 2008; Major, Hunger, Bunyan, & Miller, 2014; O'Brien, Hunter, Halberstadt, & Anderson, 2007). Finally, the present study did not explicitly manipulate the success of weight loss attempts, but doing so could provide a more ecologically valid examination of people's experiences with variable success and failure (e.g., weight cycling) or repeated failures to lose weight despite high effort.

Conclusion

The present research builds on previous weight stigma research by demonstrating that offset effort plays an important role in

negative evaluations of individuals with obesity, and that the emotion disgust can partially explain those effects. From an applied standpoint, the identification of a pro-effort bias suggests that interventions to reduce weight stigma might be improved by highlighting the fact that many individuals with obesity are actively trying to lose weight. In this way, we can work toward developing more effective ways to minimize the widespread prejudice and discrimination against individuals with obesity. It is important to note that the present research might bear relevance to other social stigma (e.g., drug abuse) beyond the domain of weight stigma; if this is the case, then the idea of a pro-effort bias could have broad implications for reducing stigma toward a range of groups.

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