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Disgust predicts prejudice and discrimination toward individuals with obesity

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Abstract

This study examined the relevance of disgust to evaluations of an obese target person, and the connection between disgust and prejudice toward that person. Participants ($n = 598$) viewed an image of an obese or non-obese woman, and then evaluated that woman on a number of dimensions (emotions, attitudes, stereotypes, desire for social distance). Compared with the non-obese target, the obese target elicited more disgust, more negative attitudes and stereotypes, and a greater desire for social distance. Furthermore, disgust mediated the effect of the target's body size on all of the outcome variables (attitudes, stereotypes, social distance). Disgust plays an important role in prejudice and discrimination toward individuals with obesity, and might in part explain the pervasiveness of weight bias.

Weight bias is pervasive in Western cultures, and increasingly in non-Western cultures as well (Brewis, Wutich, Fallette-Cowden, & Rodriguez-Soto, 2011). One of the primary challenges faced by researchers in the area is that efforts to reduce weight bias have generally been ineffective (Danielsdottir, O'Brien, & Ciao, 2010). Most of these previous bias-reduction efforts have focused on changing people's cognitive beliefs about obesity (e.g., the belief that body weight and obesity are under personal control), but there has been a recent shift toward examining the emotions underpinning prejudice toward individuals with obesity. Intergroup emotions have featured prominently in the study of prejudice toward various social groups (Iyer & Leach, 2008), and focusing on intergroup emotions might provide an avenue for understanding the pervasiveness of weight bias.

The intergroup emotions most relevant in the current context are the "moral emotions"; namely disgust, contempt, and anger (Hutcherson & Gross, 2011; Rozin, Lowery, Imada, & Haidt, 1999). Disgust is elicited when individuals cause impurity or degradation to the self/others (Rozin et al., 1999) or when individuals engage in what are perceived as intentional immoral behaviors (Hutcherson & Gross, 2011); contempt is elicited when people violate their duties or responsibilities within the community or social hierarchy (Rozin et al., 1999) or are perceived as incompetent (Hutcherson & Gross, 2011); and anger is typically elicited when individuals harm others or infringe on the freedom of others (Rozin et al., 1999), particularly when the transgression is appraised as self-relevant (Hutcherson & Gross, 2011). Cottrell and Neuberg (2005) suggested that the specific emotion elicited by a group depends on the threat posed by that group. Because obese people are not generally seen as threatening to others or as infringing on the freedom of others, disgust (and perhaps contempt) responses might be more relevant than anger responses in prejudice toward obese people.

Disgust has received the most attention in the weight-bias literature thus far. For example, Park, Schaller, and Crandall (2007) found that obesity is implicitly associated with disease-related concepts. Furthermore, a series of studies by Vartanian (2010a) showed that disgust toward individuals with obesity was associated with more negative attitudes toward those individuals, and that disgust mediated the association between beliefs about the controllability of body weight and attitudes toward individuals with obesity. Comparing the role of different emotions in weight bias, Vartanian, Thomas, and Vanman (2013) found that disgust predicted negative obesity stereotypes, but that contempt and anger did not, thus suggesting a unique role for disgust. Other researchers have examined the different types of disgust, referred to as "functional domains" of disgust, which include sexual disgust, moral disgust, and pathogen disgust (Tybur, Lieberman, & Girskevicius, 2009). For example, Lieberman, Tybur, and Latner (2012) found significant levels of self-reported disgust toward individuals with obesity in each domain, but also found that sexual disgust (i.e., how

disgusting it would be to have sex with an obese person) was significantly higher than the other two domains. Overall, there is consistent evidence that disgust is related to evaluations of individuals with obesity.

Although the studies described above provide initial insights into the connection between disgust and obesity, those studies involved evaluations of obese people at a group level or as an abstract category, rather than focusing on evaluations of a specific individual. It is possible that people's mental representation of "obese people" is more extreme than the average person they might encounter in daily life who happens to be obese (Vartanian, 2010b), which might exaggerate the observed associations. Thus, it is unclear whether the same emotional processes will be involved when evaluating a specific target person whose weight status or group membership is not explicitly labeled. Furthermore, prejudice is often experienced at an individual level (e.g., in the form of job discrimination; Rudolph, Wells, Weller, & Baltes, 2009). Therefore, it is important to determine whether intergroup emotions (in particular, disgust) are related to prejudice toward a specific target person.

An important component of the individual experience of weight-based discrimination is being avoided or excluded by others. For example, in a study of individuals in a residential weight-loss facility, 56% reported that they had been avoided, excluded, or ignored because of their weight (Friedman et al., 2005). Similarly, in another study of weight stigma among adult members of a weight-loss support group, 48%–54% reported being avoided, excluded or ignored (Puhl & Brownell, 2006). Although there is evidence that individuals with obesity often feel excluded by others, few studies examining prejudice toward individuals with obesity have measure avoidance of those individuals as an outcome. One study did find that implicit anti-fat attitudes predicted how far participants chose to sit from an obese person (Bessenoff & Sherman, 2000). Another study showed that participants who viewed stereotypical portrayals of individuals with obesity expressed more desire for social distance than did participants who viewed non-stereotypical portrayals (Pearl, Puhl, & Brownell, 2012). However, there have been no studies examining the role of intergroup emotions in a desire for social distance from individuals with obesity. Because disgust is generally considered to be an avoidance emotion (Oaten, Stevenson, & Case, 2009), it seems likely that disgust would be related to a desire for social distance from individuals with obesity. Thus, examining the association between intergroup emotions and social distance will enhance our understanding of the processes involved in weight bias.

This study extends previous research in two primary ways: (1) We examined the relevance of intergroup emotions to evaluations of a specific target person rather than evaluations of an abstract group; and (2) we examined whether intergroup emotions could explain desire for social distance from the target person, as well as attitudes and stereotypes toward that person. Participants were shown either an obese target person or a non-obese target person and were asked to evaluate that person on a number of dimensions. We predicted that: participants would rate the obese target more negatively than they would rate the non-obese target; disgust would be a better predictor of evaluations of the target than would contempt or anger; and disgust would mediate the effect of the target's weight on evaluations of that target.

Method

Participants

Participants were 606 individuals based in the United States who were recruited through Amazon's Mechanical Turk. Mechanical Turk has been shown to produce data comparable in quality and reliability to traditional methods (Buhrmester, Kwang, & Gosling, 2011; Vartanian et al., 2013). Eight participants were excluded from the study because they failed at least one of the validity checks (questions directing participants to select a particular response option). The final sample consisted of 598 participants (337 males, 261 females). Their mean age was 35.88 years ($SD = 11.66$), and their mean Body Mass Index (BMI) based on self-reported height and weight was 26.39 ($SD = 6.14$). The majority of the sample was Caucasian (80.6%), 6.5% were African-American, 6.5% were Asian, 5.4% were Hispanic, 0.3% were American Indian, and 0.7% identified as "other." This study was approved by the university's human ethics committee.

Materials and procedure

The study was advertised on Amazon's Mechanical Turk as a study on "person perception," and participants completed the study online. Participants were randomly assigned to view a photograph depicting a female target person as obese or as healthy weight, along with some additional background information about the target and her daily activities (e.g., age 35, owns a pet, enjoys shopping). The images were taken from an individual's personal webpage showing images of herself before and after she had lost weight. Using images of the same person, we can vary the target's weight while keeping constant other personal features (such as attractiveness) that could influence evaluations of the target. The individual is in the same pose in both photographs, with the same hairstyle and facial expression, and both photographs are taken against a neutral monochromatic background. After viewing their assigned image and reading the information, participants were asked to rate the target on the following measures:

Intergroup emotions

Participants indicated the extent to which they felt disgust, contempt, and anger toward the target individual. Each

emotion was measured as a discrete item using a visual analogue scale (anchored by 0 = *Not at all*, 100 = *Extremely*). The initial marker position was set at "0" for all of the visual analogue scales in this study.[1] We also included some additional emotions (fear, sadness, happiness, pity, and sympathy) as filler items to mask our interest in disgust, contempt, and anger, but these emotions were not included in the analyses.

Attitude

Participants provided an overall rating of their attitude toward the target ("How favorable is your attitude toward [the target person]?") using a 7-point scale (1 = *Extremely unfavorable*, 7 = *Extremely favorable*).

Stereotypes

Participants rated the target individual on a series of common obesity stereotypes, including: lazy, sloppy, self-disciplined (reverse-scored), motivated (reverse scored), over-indulgent, and having poor personal hygiene. Responses to these six items were averaged to compute a Negative Obesity Stereotypes (NOS) composite score ($\alpha = .84$). Participants also provided judgments of the target individual on a more general stereotype dimension relating to perceived competence (i.e., competent, efficient, successful, and intelligent; $\alpha = .91$). For each stereotype 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. We also included additional character traits (likeable, shy, popular, unhappy, irritable, and aggressive) as filler items to mask our focus on common obesity stereotypes, but these traits were not included in the analyses.

Social distance

Participants completed a version of the Social Distance Scale (SDS; Link, Cullen, Frank, & Wozniak, 1987), which was used as an index of willingness to approach or avoid the target individual. Participants were asked to indicate their willingness to engage in seven situations involving the target individual (e.g., "Working on the same project as…") on a 4-point scale (1 = *Definitely unwilling*, 4 = *Definitely willing*). A social distance index was created by averaging responses to these items ($\alpha = .89$). For ease of interpretation, scale scores were reverse-coded so that higher values represent a stronger desire for social distance.

In addition to the SDS, participants also completed an online version of the Seating Distance Task (Macrae, Bodenhausen, Milne, & Jetten, 1994) as a measure of avoidance. In the traditional version of this task, participants are led to a room where they believe the other participant has already selected a seat, and the measure of social distance is how far participants choose to sit from the other participant. Recently, researchers have sought to identify more efficient ways of capturing a desire for physical distance. For example, one recent study had participants draw where they would sit relative to a target person and measured the distance between the two drawn images (McIntyre, Barlow, & Hayward, 2015). In this study, participants were shown an image of a table and seven seats with the target individual's seat marked, and they were asked to indicate which seat they would choose for themselves. There were two versions of this task: one version showed a row of seven seats on one side of a rectangular table with the target sitting in the center seat; the second version showed a round table with the target sitting in the seat at the bottom of the image. The seats that participants could choose for themselves were coded as follows: one seat removed from the target to the left or to the right was coded as "1"; two seats removed from the target to the left or to the right was coded as "2"; and three seats removed from the target to the left or to the right was coded as "3." There were no interactions between version of the seating distance task and target weight status for any of the analyses reported below, and the two versions were therefore combined for all analyses. Responses on the seating distance task were significantly correlated with scores on the SDS ($r = .40$, $p < .001$), supporting the validity of the measure.

Data analysis

Data for disgust, anger, and contempt were positively skewed. Transforming these variables using the base 10 logarithm function did effectively normalize the distribution (skew ranged from 1.24 to 1.66), but the transformation had no impact on the pattern of results. Therefore, all analyses are reported using the untransformed variables. Multivariate Analysis of Variance (MANOVA) was used to compare the obese target and non-obese targets on the dependent variables. The multivariate analysis was followed up with a univariate analysis for each dependent variable. We then conducted a series of multiple regression analyses to determine whether disgust, contempt, and anger differentially predicted each of the outcome variables (attitudes, negative obesity stereotypes, competence, SDS scores, and seating distance). Although disgust, contempt, and anger were significantly correlated with one another (disgust-contempt $r = .41$, $p < .001$; disgust-

[1]To test whether the start position influenced participants' emotion ratings, we conducted a follow-up study in which participants were exposed to the information about the obese target person and then rated that target on each of the emotion terms. The start position for the marker on the visual analogue scale was randomly set to 0, 50, or 100. There was no significant effect of starter position, $F(2, 168) = 1.51$, $p = .22$, and there were no significant contrasts between any of the starter positions ($ps > .10$). Thus, setting the marker to the 0 point is unlikely to have influenced the results of this study.

Table 1 Means (SD) for Each of the Dependent Variables

	Obese target ($n = 298$)	Non-obese target ($n = 299$)	Cohen's d	p
Intergroup emotions				
Disgust	8.11 (16.63)	2.48 (8.22)	0.43	$< .001$
Contempt	9.68 (18.61)	8.38 (21.24)	0.07	.43
Anger	3.76 (9.00)	2.63 (7.97)	0.13	.11
Attitude				
How favorable. . .?	5.04 (1.16)	5.52 (0.94)	0.46	$< .001$
Stereotypes				
Negative obesity stereotypes	37.33 (19.21)	22.89 (13.75)	0.86	$< .001$
Competence	55.19 (20.39)	60.98 (20.30)	0.28	.001
Social distance				
Social Distance Scale	1.88 (0.58)	1.77 (0.48)	0.20	.01
Seating distance task	1.61 (0.72)	1.38 (0.62)	0.34	$< .001$

anger $r = .70$, $p < .001$; contempt-anger $r = .49$, $p < .001$), multicollinearity does not appear to be a problem in this study (rs $< .80$; tolerances $> .40$; VIFs < 2.5). Next, we used mediation analysis (using the PROCESS macro; Hayes, 2013) to determine whether intergroup emotions mediated the effect of target weight status on the outcome variables. This approach uses bootstrapping, which involves repeatedly sampling from the data set (in this case, 5,000 bootstrap resamples) to create an approximation of the sampling distribution of the indirect effect and to generate confidence intervals for these effects. Finally, because there were no interactions involving participant age, sex, or BMI for any of the analyses, and because controlling for age, sex, and BMI did not affect any of the outcomes, these factors were not included in the analyses reported below.[2]

Results

Table 1 shows the mean ratings of the obese target and non-obese target on each of the dependent variables. There was an overall effect of target weight status on the combination of dependent variables, $F(8, 588) = 16.25$, $p < .001$, $\eta_p^2 = .18$. Univariate analyses indicated that participants expressed more disgust toward the obese target than toward the non-obese target, but not more anger or contempt. Participants also reported more negative attitudes toward the obese target, rated the obese target higher on the measure of negative obesity stereotypes, and rated the obese target as less competent than they did the non-obese target. Finally, participants indicated a greater desire for social distance from the obese target than from the non-obese target on both the SDS and on the seating-distance task.

Table 2 Regression Coefficients Predicting Attitudes, Stereotypes, and Social Distance from Intergroup Emotions

	β	t	p
Attitude			
Disgust	−.47	9.16	$< .001$
Contempt	.05	1.06	.29
Anger	.02	0.45	.66
Negative obesity stereotypes			
Disgust	.58	11.49	$< .001$
Contempt	−.08	2.03	.04
Anger	−.09	1.77	.08
Competence			
Disgust	−.30	5.48	$< .001$
Contempt	.08	1.71	.09
Anger	.04	0.64	.52
Social distance			
Disgust	.33	6.11	$< .001$
Contempt	−.02	0.42	.67
Anger	.08	1.34	.18
Seating distance			
Disgust	.20	3.68	$< .001$
Contempt	.02	0.37	.71
Anger	.07	1.17	.24

We next examined disgust, contempt, and anger as predictors of prejudice toward the target individuals. The overall regression model was significant for attitudes toward the target, $F(3, 593) = 47.66$, $p < .001$, adj-$R^2 = .19$; for NOS, $F(3, 593) = 62.79$, $p < .001$, adj-$R^2 = .24$; for competence, $F(3, 593) = 14.41$, $p < .001$, adj-$R^2 = .06$; for SDS scores, $F(3, 593) = 32.11$, $p < .001$, adj-$R^2 = .14$; and for seating distance, $F(3, 593) = 14.82$, $p < .001$, adj-$R^2 = .07$. In each case, disgust was a significant predictor of the outcome variable, but contempt and anger were not significant predictors (see Table 2). The only exception to that pattern was that contempt was a significant negative predictor of NOS, with the coefficient suggesting that the more contempt people felt toward the target, the *less* they attributed negative obesity stereotypes to her. Note, however, that this finding is contrary to the small positive bivariate correlation observed between contempt and negative obesity stereotypes ($r = .11$, $p = .01$), suggesting a suppression effect in the regression analysis.

Finally, because only disgust was associated with the outcome variables, only disgust was included as a mediator in the mediation analyses. Those analyses showed that there was a significant indirect effect of the target's body weight on each of the outcome variables through disgust: attitudes toward the target (point estimate = −0.19, $SE = 0.04$, 95% CI = −0.28, −0.11); NOS (point estimate = 3.15, $SE = 0.65$, 95% CI = 2.01, 4.55); competence (point estimate = −1.96, $SE = 0.52$, 95% CI = −3.15, −1.09); SDS (point estimate = 0.08, $SE = 0.02$, 95% CI = 0.05, 0.12); and

[2]The literature on weight bias consistently finds that even individuals who are overweight or obese hold negative attitudes toward obese people (e.g., Schwartz, Vartanian, Nosek, & Brownell, 2006; Wang, Brownell, & Wadden, 2004), suggesting a lack of in-group favoritism among individuals with obesity.

seating distance (point estimate = 0.07, $SE = 0.02$, 95% CI = 0.04, 0.10).

Discussion

This study extended previous research by demonstrating that intergroup emotions play an important role in evaluations of a specific individual with obesity, in addition to the general role they play in evaluations of obese people as a group (Vartanian, 2010a; Vartanian et al., 2013). Specifically, the obese target elicited more disgust than did the non-obese target, which in turn was associated with more negative attitudes, more negative stereotyping, and a greater desire for social distance from the target. These findings are important because they contribute to our understanding of the potential role of disgust in interpersonal interactions and, specifically, in instances of weight-based stigmatization.

Our findings also provide further support for the notion disgust, in particular, is an important component of weight bias (Vartanian et al., 2013): neither contempt nor anger were differentially associated with the target based on her weight, and those emotions also did not predict any of the outcome variables. These findings fit with general conceptualizations of moral emotions (Hutcherson & Gross, 2011; Rozin et al., 1999). Obesity might be seen as an impurity or degradation of the self, and the behaviors presumed to make a person obese (e.g., overindulgence, laziness) may be seen an immoral behaviors, thus giving rise to a disgust response toward individuals who are obese. In contrast, individuals with obesity are not typically viewed as threatening or as infringing on one's personal rights and freedoms, and therefore should not elicit anger. Furthermore, although obesity might be viewed as violating social standards in some respects, this might not amount to the type of violation of responsibilities to the community that would elicit contempt.

An important contribution of the present research is that we examined the relevance of disgust to a desire for social distance from the target person. With both measures (the SDS and the seating distance task), we found that disgust mediated the effect of target's weight on the desire for social distance. These findings suggest that, in addition to playing a role in negative attitudes and stereotypes toward individuals with obesity, disgust might also lead to avoidance or exclusion of individuals with obesity in social contexts. People with obesity often report being excluded or ignored (Friedman et al., 2005), and disgust (as an avoidance emotion) might in part be responsible for that exclusion. Given the known deleterious effects of social exclusion (MacDonald & Leary, 2005; Williams, 2007), it is important for future research to consider this component when studying weight bias. Note that the measures of avoidance and distance we used in this study did not assess actual behavior toward an individual with obesity, but rather relied on self-reports of what people would do, and thus replication of these results in an interpersonal context would be important. Future research could also determine whether disgust is related to other forms of discrimination against individuals with obesity (e.g., hiring decisions, punishment).

This study was conducted with an online community sample which allowed for a greater range of age and BMI than is typical in a student sample, increasing the generalizability of our findings. Note, as well, that previous studies have found similar results between student samples and online community samples (Fardouly & Vartanian, 2012; Vartanian & Fardouly, 2014; Vartanian et al., 2013), suggesting that these findings regarding weight bias are robust. One limitation of this study, however, is that our measures of emotions were based on self-reports. Although a substantial amount of past research has used self-reported emotions when studying both prejudice and basic emotional processes (Tapias, Glaser, Keltner, Vasquez, & Wickens, 2007), future studies using other indices of emotion, such as physiological measures, would be beneficial to our understanding of the emotional reactions to obesity. It should also be noted that the overall level of reported disgust, even toward the obese target, was quite low, and the regression models showed that intergroup emotions accounted for 6%–24% of the variance in outcomes. Thus, although disgust does differentiate obese from non-obese targets, and is a significant predictor of prejudice toward individuals with obesity, there are likely additional factors involved in weight bias that need to be considered if we hope to develop effective interventions. A final methodological point is that this study only included female targets. Although some past work suggests that bias is similar for male and female targets (Vartanian & Fardouly, 2014), it might be that the emotional responses are different to men and to women.

Intergroup emotions, and in particular disgust, have been shown to play an important role in prejudice toward obese people as a group (Vartanian, 2010a; Vartanian et al., 2013), and we extended those findings by showing that disgust toward a specific target person also influences prejudice and discrimination toward that person. The role of disgust in prejudice toward individuals with obesity people might be one explanation for the failure of previous bias-reduction efforts to reduce weight bias: that is, modifying people's cognitive beliefs are unlikely to change their emotional experiences. This then raises a new challenge for researchers: How do we change people's emotional reactions to individuals with obesity? One approach that might be effective is to increase positive intergroup contact. There is some evidence that professional contact (e.g., as a clinician), and also positive personal experiences, with individuals with obesity is associated with less weight bias (Schwartz, Chambliss, Brownell, Blair, & Billington, 2003). Similarly, research shows that positive portrayals of obesity in the media are associated with less weight bias (Pearl et al., 2012). It is possible this positive exposure decreases disgust responses to obesity, thereby

reducing prejudice (cf. Curtis, 2011). Another mechanism through which intergroup contact can reduce prejudice is by capitalizing on building positive emotions, such as empathy. Increased empathy is one of the mechanisms through which intergroup contact reduces prejudice (Pettigrew & Tropp, 2008). In the context of obesity, there is some evidence that understanding what it is like to be obese or learning about an individual's experience with weight-based social rejection results in less negative evaluations of individuals with obesity (Schwartz et al., 2003; Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003). Reducing negative emotions and increasing positive emotions toward individuals with obesity could be a promising means of reducing weight-based prejudice and discrimination.

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