Stigma and Health

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Jacob M. Burmeister, Maija B. Taylor, James Rossi, Allison Kiefner-Burmeister, Jessica Borushok, and Robert A. Carels

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Jacob M. Burmeister
University of Dayton

Maija B. Taylor
Bowling Green State University

James Rossi
East Carolina University

Allison Kiefner-Burmeister
University of Findlay

Jessica Borushok
Bowling Green State University

Robert A. Carels
East Carolina University

The stigma of obesity impacts individuals across numerous life domains, and people with obesity are offered little legal protection against discrimination based on their body type. While a number of experiments have shown that stigmatizing attitudes toward obesity are somewhat malleable, fewer studies have tested the impact of interventions deployable outside of the lab. Fewer still have measured the impact on individuals' support for equal rights for people with obesity. This randomized trial examined the effects of viewing the weight stigma portion of HBO's *The Weight of the Nation* documentary on viewers' attitudes about obesity across several important domains, including support for equal rights for those with obesity relative to control participants. Participants were 109 young adults who watched a portion of HBO's *The Weight of the Nation* documentary or a control video. Following completion of the video, participants were asked to volunteer for a second unrelated study on prejudice in an adjacent computer lab. It was under the guise of this "unrelated study" that weight bias was assessed. Participants' negative judgments of people with obesity, desire for social distance, and support for equal rights for people with obesity improved after watching the video. Their perceived attractiveness of people with obesity did not change relative to the control condition. This study finds support for the use of a brief documentary film as a means to reduce stigma against persons with obesity.

Keywords: weight bias, stigma reduction, obesity, equal rights, media

In addition to a plethora of negative physical consequences, obesity affects individuals psychologically and socially in the form of weight stigma. This stigma is ubiquitous and impacts people with obesity in many life domains from education and occupation to dating and health care (Puhl & Heuer, 2009). In the workplace, for example, individuals with obesity report being fired and passed over for promotion because of their weight (Roehling, Roehling, & Pichler, 2007). Educational achievement is impacted by stigma, especially for women and girls (Cohen, Rai, Rehkopf, & Abrams, 2013; Crosnoe, 2007), and there is evidence that students seeking admission to graduate training programs are disfavored in the interview process (Burmeister, Kiefner, Carels, & Musher-Eizenman, 2013). Even physicians and obesity researchers hold implicit fat biases that may lead to poorer treat-

Jacob M. Burmeister, Department of Psychology, University of Dayton; Maija B. Taylor, Department of Psychology, Bowling Green State University; James Rossi, Department of Psychology, East Carolina University; Allison Kiefner-Burmeister, Department of Psychology, University of Findlay; Jessica Borushok, Department of Psychology, Bowling Green State University; Robert A. Carels, Department of Psychology, East Carolina University.

Correspondence concerning this article should be addressed to Jacob M. Burmeister, Department of Psychology, University of Dayton, 300 College Park, Dayton, OH 45469. E-mail: jburmeister1@udayton.edu

ment of persons who are overweight (Befort et al., 2006). Experiencing obesity stigma has consequences for physical health also via impacts on health behaviors (Major, Hunger, Bunyan, & Miller, 2014; Puhl, Phelan, Nadglowski, & Kyle, 2016; Tomiyama, 2014).

Additionally, weight stigma likely has a direct effect on individuals' health by functioning as a physiological stressor (Dickerson, Gruenewald, & Kemeny, 2004). Research on the stress of social evaluation suggests that social stressors such as weight stigma can impact cortisol levels, which in turn may affect hypertension, abdominal fat storage, and cardiovascular disease (Dickerson et al., 2004; Muennig, 2008; Tomiyama, 2014). As for weight stigma specifically, seeing and experiencing weight stigma has been shown to influence cortisol in women (Schvey, Puhl, & Brownell, 2014; Tomiyama et al., 2014).

The stigmatization of people with obesity runs hand in hand with the notion that failures of self-control (i.e., laziness and gluttony) are what cause obesity in the first place. Ironically, emerging research points to the negative health effects of obesity stigma: the social pressure applied through stigmatization that is intended to punish people into losing weight is actually unhelpful. For example, in an experiment, stigmatized women consumed more calories and reported feeling unable to control their eating compared to nonstigmatized women (Major et al., 2014).

Meanwhile, the common perception that obesity is easily treated by caloric restriction and exercise is contentious (Mann et al., 2007), and the actual odds of a person successfully changing his or her weight category to become nonobese are low (Fildes et al., 2015). Thus, even though stigma is unhelpful in treating obesity, it remains part of the normative focus on individual solutions to what is actually an environmental and public health problem (Puhl & Heuer, 2009). Stigmatization of vulnerable groups has played a repeated role in society's treatment of diseases (Hatzenbuehler, Phelan, & Link, 2013). For example, men who have experienced HIV-related stigmatization are more likely to engage in risky sexual behaviors and have poorer mental health (Hatzenbuehler, O'Cleirigh, Mayer, Mimiaga, & Safren, 2011). Similarly, experiencing stigma of mental illness has been found to strongly predict future self-esteem (Link, Struening, Neese-Todd, Asmussen, & Phelan, 2001).

Negative views of individuals with obesity could have an impact at the level of public and organizational policy by impacting rules for the allocation of research funds, health insurance coverage, and discrimination in employment and housing (Brownell, 2005). Few specific laws exist to protect people who encounter weight-based discrimination even though data have shown public support for potential legal protections (Pomeranz & Puhl, 2013; Suh, Puhl, Liu, & Milici, 2014).

Biases against people with obesity appear to be exacerbated by advertising, entertainment, and news media where people with obesity are most commonly portrayed as feckless and lacking willpower (Ata & Thompson, 2010; Puhl & Heuer, 2009). Evidence that media sources incite stigma may be disheartening but also presents logical avenues for intervention. Indeed, a number of laboratory studies have attempted to modify individuals' attitudes and beliefs about people with obesity. For example, an experiment conducted by Ciao and Latner (2011) presented participants with information indicating that their negative attitudes about obesity were not in line with their own highly benevolent and universalistic values. Participants presented with this information subsequently showed more positive attitudes toward obesity. Similarly, Pearl, Puhl, and Brownell (2012) found that participants who viewed stereotypical images of adults with obesity (e.g., shown eating and watching TV) evinced more negative attitudes toward obesity. A series of studies by Brochu and Esses (2011) found that simply using the term *overweight* rather than *fat* can lead to the expression of more favorable attitudes.

While these experiments have shown that stigmatizing attitudes toward obesity are somewhat malleable, fewer studies have tested the impact of interventions deployable outside of the lab. Some have used brief workshops in attempts to alter stigmatizing attitudes. For example, participating in a series of three classes modified some components of antifat attitudes in undergraduates enrolled in a public health program (O'Brien, Puhl, Latner, Mir, & Hunter, 2010).

A handful of studies have used video-based obesity stigma interventions with mixed results.

Poustchi, Saks, Piasecki, Hahn, and Ferrante (2013) presented medical students with a 17-min video designed to teach viewers about weight stigma in health-care settings. Although the study design did not include a control or comparison group, participants' attitudes toward obesity improved after seeing the video. Gapinski, Schwartz, and Brownell (2006) studied the influence of compilations of TV clips depicting women with obesity in either a favorable (e.g., as a successful lawyer) or stereotypical light (e.g., as clownish and lazy). They did not find evidence that positive portrayals of obesity could reduce stigma relative to the negative portrayals. However, the authors speculated that overly stigmatizing depictions could have led participants to feel empathy for the characters with obesity. Hennings, Hilbert, Thomas, Siegfried, and Rief (2007) showed female high school students videos of girls describing their struggle with weight, finding unexpected results. While the participants did show more understanding of the struggles faced by those with obesity, prejudice against persons with obesity actually increased postintervention. Importantly, the videos used in these studies were either compilations of TV clips or amateur-produced interviews. In contrast to these studies, a novel pilot study by Swift et al. (2013) measured the impact of two high-quality videos on health-care students' attitudes toward obesity, with encouraging results. The videos, created by the Rudd Center for Food Policy and Obesity, featured the fictional account of a teenage girl struggling with stigmatization from peers as well as a series of expert commentaries explaining how stigma can affect the quality of health-care delivery. The authors noted some limitations, including a somewhat small sample ($N = 43$) and possible demand characteristics, but results indicated a lessening of explicit bias relative to a control group, suggesting that video interventions for weight stigma are a viable option for larger scale stigma reduction programs (Swift et al., 2013). Despite some successes in changing attitudes toward obesity, weight stigma has remained a stubborn problem (Daníelsdóttir, O'Brien, & Ciao, 2010; Lee, Ata, & Brannick, 2014). Two reviews—a meta-analysis (Lee et al., 2014) and a narrative review (Daníelsdóttir et al., 2010)—have suggested varying degrees of effectiveness for weight stigma interventions. The findings of Lee et al. (2014) suggest consistent small effect sizes ($N = 29$) for a variety of intervention types, noting similar effects for interventions that utilized empathy, social consensus, or perceived controllability of weight. A 2010 narrative review summarizing the results of 16 studies suggests that more research is needed, as the authors found inconsistent effects for antifat prejudice programs (Daníelsdóttir et al., 2010). The authors called for increased research outside of laboratory settings with greater methodological rigor.

In 2012, the cable network HBO premiered a four-part documentary series called *The Weight of the Nation* (Hoffman & Chaykin, 2012). Its purpose was to educate viewers about the causes and consequences of obesity in the United States. The DVD and Internet releases of the series also include a 17-min segment that centers on a discussion of prejudice against individuals with obesity. In the film, real people with obesity describe their experiences with stigmatization from doctors, family members, employers, loved ones, and strangers. The film also features expert commentary from obesity stigma researchers; presents basic information on obesity stigma; and appears to be well made, with high-quality production value. While positive portrayals of obesity in the media tend to be rare (Greenberg, Eastin, Hofschire, Lachlan, & Brownell, 2003), this documentary presents people with obesity in an overall positive light. It has an apparent, but untested, potential to change attitudes. In the present study, this film was tested as a method for changing attitudes toward people with obesity.

An understudied component of antifat attitudes in studies of weight bias is participants' support for equal rights for the stigmatized persons. One study by Brochu, Pearl, Puhl, and Brownell (2014) found that stigmatizing images affected viewers' support of a potentially discriminating public health policy. Another study found evidence that the way messages about obesity discrimination are framed may not necessarily impact respondents' support for legislation protecting people for weight discrimination, though there may be important moderating factors (Puhl, Heuer, & Sarda, 2011). Support for equal rights is a construct likely to be somewhat independent of general antifat attitudes (Latner, O'Brien, Durso, Brinkman, & MacDonald, 2008) and is important given the many

forms of discrimination faced by people with obesity. Discovering whether stigma reduction interventions can affect people's support for equal rights for persons with obesity is an important step toward improving care for people with obesity at the societal level.

The current randomized controlled trial used a pretest–posttest between-groups design to test the hypothesis that watching a brief documentary would improve viewers' attitudes about obesity across several important domains, including support for equal rights for those with obesity.

Method

Participants were 109 undergraduates (M_{age} = 18.65, SD = 1.23) enrolled at a medium-sized university in the Midwestern United States who received course credit for participation. Participants identified themselves as female (77%), White (73%), Black (12.2%), Hispanic (4.3%), Asian (1.7%), and other (8.7%). Average body mass index (BMI) was 24.2 (SD = 4.8). The university's institutional review board approved the study.

Procedure

A priori power analyses using G*Power software (version 3.1.9.2) revealed that a sample of 90 participants would be required to detect small effects between groups (Faul, Erdfelder, Lang, & Buchner, 2007). Data were to be collected from 120 participants to buffer against incomplete or missing data. Eleven participants did not complete pretest measures before being randomized to condition and were removed from analyses. See Figure 1 for a participant flow diagram.

Participants were recruited via the university's online research participation system. After consenting to participate, participants provided their demographic information and completed a

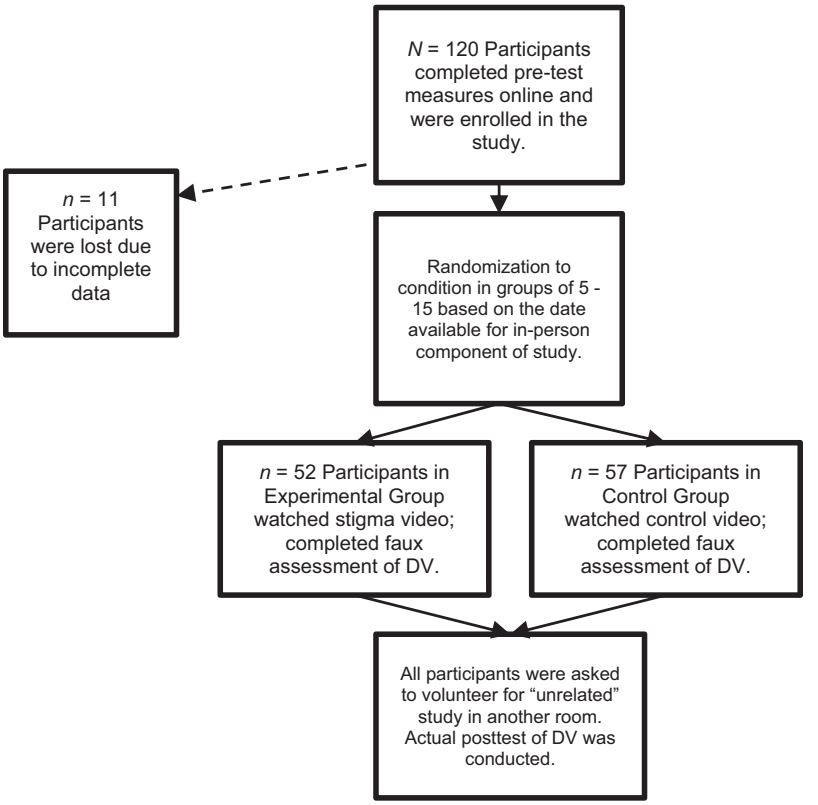

Figure 1. Participant flow diagram. DV = Universal Measure of Bias.

pretest measure of obesity stigma (i.e., Universal Measure of Bias—Fat [UMB]). They were then assigned a date approximately 1 week later to report to a classroom on campus for the in-person portion of the study, which included watching a video in a group setting. Randomization was conducted via coin flip for each day participant groups were scheduled. In groups of five to 15, participants viewed either the weight stigma reduction video or the control video. Following the film, participants filled out a 20-item distraction questionnaire about their attitudes toward the people in the video. This deception was designed to mislead participants into believing that the study was complete. The distraction questionnaire was made by modifying the Attitudes Toward Obese Persons scale (Allison, Basile, & Yuker, 1991). All mentions of "obese persons" were removed from the measure and replaced with "people in the video." On a 6-point scale of −3 to 3, participants rated their agreement with statements such as "People like those in the video should not expect to lead normal lives" and "Most people would not want to marry anyone like the people in the video." Because "people in the video" were the focus of the statements, this measure could be used in identical form for both the intervention group (who watched the weight-related video) and the control group (who watched the drug-related video). The data from this questionnaire were not analyzed and only served as a distractor. After completing the mock questionnaire, participants were asked to volunteer for a second unrelated study in an adjacent computer lab. It was under the guise of this "unrelated study" that the dependent measure (UMB) was deployed.

Measures

UMB. The UMB is a 20-item measure of attitudes toward obese individuals, with responses measured on a 7-point Likert scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*; Latner et al., 2008). The UMB was designed to assess attitudes toward various stigmatized groups, including ethnic minorities, lesbian, gay, bisexual, transgender (LGBT) individuals, and people with obesity. A strength of the UMB is that it allows for comparisons between stigmatized groups by providing statement stems modifiable with the insertion of the name of the stigmatized group. The UMB has also been shown to have excellent psychometric properties (Latner et al., 2008). Items were scored in accordance with the methods Latner et al. (2008), and mean subscale scores were calculated. For the present study, higher scores on the Negative Judgment and Social Distance subscales suggest higher bias, whereas lower scores on the Attraction and Equal Rights subscales suggest higher bias.

Importantly, the UMB assesses several forms of social stigma via four subscales. The four subscales include (a) Negative Judgment (five items, higher scores suggest stronger bias; e.g., "Fat people tend toward bad behavior"); (b) Social Distance (five items, higher scores suggest stronger bias; e.g., "I would not want a fat person as a roommate"); (c) Attraction (five items, higher scores suggest less bias; e.g., "I find fat people attractive"); and (d) Equal Rights (five items, higher scores suggest less bias; e.g., "Special effort should be taken to ensure that fat people have the same rights and privileges as other people"). Measurement of these varying forms of stigma is important given that stigmatization is likely resultant from several different psychological mechanisms that vary further across different contexts (Kurzban & Leary, 2001) and manifest in a variety of life domains (Puhl & Heuer, 2009). Cronbach's alphas for the subscales in this study ranged from .90 to .92.

Intervention

Participants in the experimental condition viewed the weight stigma section of *The Weight of the Nation*. Participants in the control condition viewed 17 min of a film titled *Overtaken* (Barber & Brant, 2012). The film was chosen as a control for its potential to elicit strong emotions and humanize the victims of drug dependency through interviews and personal stories. Similar to *The Weight of the Nation*, this film featured emotional interviews regarding the human cost of substance abuse, including interviews with survivors of opioid dependency and family members of individuals who had overdosed. People featured in *Overtaken* did not have obesity.

Results

There were no differences between participants in each condition on demographic variables, including sex, race, class standing, and relationship status, or in pretest scores of the UMB subscales. BMI was correlated with pretest ratings on only the Attraction subscale, $r = .29$, $p = .003$, suggesting that participants' BMIs were positively associated with their ratings for the attractiveness of people with obesity; BMI was controlled or in analyses involving the Attraction subscale. Four analyses of covariance (ANCOVAs) were conducted to assess the impact of the independent variable (obesity stigma reduction vs. control) on participants' scores on the four subscales of the UMB while controlling for pretest scores (see Table 1). BMI was an additional control variable in one ANCOVA that tested for differences in posttest Attraction ratings. Analyses were performed using Version 23 of Statistical Package for the Social Sciences (SPSS). See Figure 2 for a graph of the means.

Negative Judgments

A one-way ANCOVA was conducted to evaluate whether there was a statistically significant difference between the weight stigma video and the control video on participants' negative judgments about people with obesity, controlling for pretest negative judgments. There was a significant effect for video type on participants' negative judgments, $F(1, 105) = 12.42$, $p = .001$, partial $\eta^2 = .11$.

Social Distance

A one-way ANCOVA was conducted to evaluate whether there was a statistically significant difference between the weight stigma video and the control video on participants' desire for social distance from people with obesity, controlling for pretest social distance ratings. There was a significant effect for video type on participants' desire for social distance, $F(1, 105) = 4.11$, $p = .045$, partial $\eta^2 = .04$.

Attraction

A one-way ANCOVA was conducted to evaluate whether there was a statistically significant difference between the weight stigma video and the control video on participants' Attraction to people with obesity, controlling for pretest Attraction and BMI, which was shown to be correlated with pretest ratings. There was not a

Table 1
Means, Standard Deviations, and Ranges by Condition

Variable	Condition	
	Stigma reduction *M* (*SD*, range)	Control *M* (*SD*, range)
Negative Judgments of people with obesity		
Pretest	2.68 (1.13, .80–5.0)	2.95 (1.19, 1.0–5.0)
Posttest	2.17 (1.00, 1.0–4.2)	3.00 (1.23, 1.0–5.2)
Mean change	−.49 (1.08)	.01 (.94)
Desire for Social Distance from people with obesity		
Pretest	2.47 (.83, 1.0–4.4)	2.65 (1.00, .80–5.6)
Posttest	2.25 (.91, 1.0–4.4)	2.63 (1.03, 1.0–6.0)
Mean change	−.26 (.92)	−.01 (.88)
Ratings of Attraction toward people with obesity		
Pretest	2.66 (.88, .80–5.6)	2.42 (.92, .80–4.4)
Posttest	3.48 (1.24, 1.0–7.0)	3.00 (1.13, 1.0–5.0)
Mean change	.82 (.96)	.58 (.61)
Support for Equal Rights for people with obesity		
Pretest	4.95 (1.46, 1.0–7.0)	5.18 (1.57, 1.0–7.0)
Posttest	5.89 (1.06, 2.80–7.0)	5.16 (1.40, 1.4–7.0)
Mean change	.95 (1.27)	−.05 (1.08)

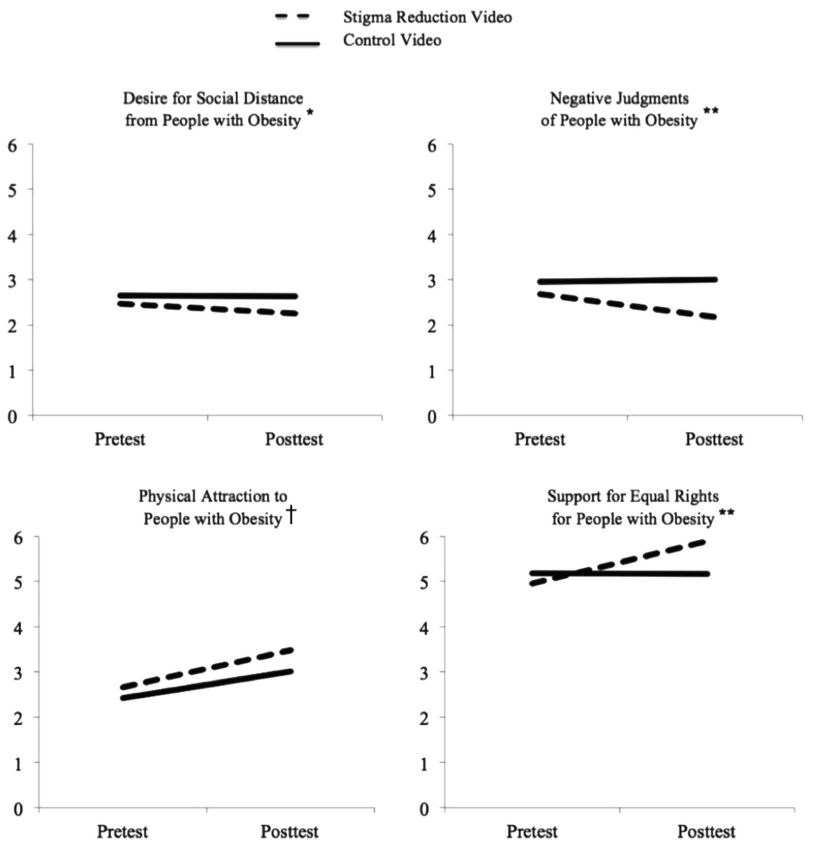

Figure 2. Universal Measure of Bias—Fat (UMB) subscale scores pre- and postintervention versus control. Line graphs of ANCOVA results demonstrating posttest differences between conditions controlling for pretest ratings. The ANCOVA testing Physical Attraction also controlled for body mass index (BMI). Higher scores on Social Distance and Negative Judgment subscales suggest more obesity stigma. Higher scores on Physical Attraction and Equal Rights subscales suggest less obesity stigma. * $p = .045$. ** $p = .001$. † $p = .082$.

significant effect for video type on participants' Attraction ratings, $F(1, 106) = 3.09$, $p = .082$, partial $\eta^2 = .03$.

Equal Rights

A one-way ANCOVA was conducted to evaluate whether there was a statistically significant difference between the weight stigma video and the control video on participants' desire for equal rights for people with obesity, controlling for pretest ratings. There was a significant effect for video type on participants' desire for equal rights for people with obesity, $F(1, 105) = 23.27$, $p = .001$, partial $\eta^2 = .18$.

Discussion

The current study examined the effect of watching a brief weight stigma documentary on viewers' attitudes toward individuals with obesity. In this investigation, negative attitudes, desire for social distance, and belief that individuals with obesity deserve equal rights improved. These results suggest that a brief high-quality video aimed at reducing weight stigma may be an effective option for reducing weight bias.

An important and understudied topic within weight stigma research is the support for equal

rights for persons with obesity. The current study found that support for equal rights for members of a group stigmatized for their physical health can be improved independent of other attitudes (e.g., likability, attraction). This suggests, for example, that improving the plight of those suffering from obesity via public health policy changes might be possible even if more direct interpersonal aspects of obesity stigma do not improve—that is, even if people report not being attracted to those with obesity, they still want to see rights protected.

While this study did find an improvement in negative attitudes toward individuals with obesity and greater endorsement of the belief that individuals with obesity deserve equal rights and treatment, the study failed to improve assessments of attractiveness relative to the control condition. Posttest ratings of attractiveness did approach statistical significance ($p = .082$), with mean scores of 3.48 for the stigma reduction group and 3.00 for the control group. Thus, it could be that more power would have been required to reject the null in this case. Alternatively, this null finding may highlight the limits to this investigation's approach to stigma reduction. Modifying what people believe to be physically attractive or who they desire to be in a close relationship with may be more difficult due to biologically based preferences (Buss, 1989) and culturally ingrained beliefs that are resistant to change (Lee et al., 2014). Positive interpersonal contact over the long term may be a better route toward modifying this component of weight stigma (Koball & Carels, 2015).

The present study has a few notable limitations. First, the study was conducted with college students who were primarily Caucasian females, and thus the findings may not be generalizable to an older, more diverse population. Additionally, changes in weight biases were not measured beyond the postassessment period, so the intervention's lasting effects are unknown. Finally, although the assessment of weight bias was disguised and ostensibly part of a different study, participants' suspicions of the true purpose of the study were not systematically measured, so it is difficult to calculate possible social desirability in responding.

The current findings provide a foundation on which to build future stigma reduction programs. Future research should extend the follow-up period to examine how long-lasting the positive change in weight bias is. Certainly, lingering questions remain concerning the specific stimuli required for changing weight bias. Determining the dosing, active ingredients, and mechanisms through which these changes occur is important. It will be important to isolate the factors that are most effective at reducing stigma, such as first-person accounts, expert commentary, empathy, and expert opinion. The video used in this experiment utilized all of these, but other promising avenues for reducing stigma were not tested in the current study. As an example, recent research has highlighted additional factors that are useful in changing biased attitudes, such as meaningful interpersonal interaction with people with obesity (Koball & Carels, 2015). One drawback of not improving the more face-to-face aspects of weight bias such as attraction is that it could result in a form of the "not in my backyard" phenomenon; that is, interventions like the one used in the current study might change attitudes to the point where participants will support something distant and ambiguous (like support for equal rights) while remaining less willing to change more immediate aspects of social interaction to accommodate people with obesity, such as being friends, dating, or sharing living space.

Both the present study and Swift et al.'s (2013) investigation included firsthand accounts of being stigmatized as well as expert commentaries explaining how stigma can affect individuals with obesity. Determining which specific components are most effective will be an important area of future inquiry. An understanding of the essential components of effective interventions could be used to enhance future programs developed for specific populations known to be biased against obesity. For example, a stigma reduction documentary could be tailored to health-care professionals and recommended as a standard part of their training with the goal of improving their professional interactions with individuals with obesity. Shining a more focused light on the core aspects that create change could lead to refined interventions and the development of better public health campaigns that reduce stigma while promoting health. It is becoming increasingly apparent that weight bias affects individuals' medical treatment and health outcomes (Puhl et al., 2016).

In sum, findings indicate that negative judgments toward people with obesity, desire for

social distance, and belief in equal rights for individuals with obesity improved after watching a brief documentary about weight stigma. Given that individuals with obesity face weight stigmatization in multiple domains and that research has shown negative physical and psychosocial health outcomes as a result of weight bias, further investigation into effective methods for reducing stigma is imperative.

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