

Exposure to Weight-Stigmatizing Media: Effects on Exercise Intentions, Motivation, and Behavior

Rebecca L. Pearl, John F. Dovidio, Rebecca M. Puhl & Kelly D. Brownell

To cite this article: Rebecca L. Pearl, John F. Dovidio, Rebecca M. Puhl & Kelly D. Brownell (2015) Exposure to Weight-Stigmatizing Media: Effects on Exercise Intentions, Motivation, and Behavior, Journal of Health Communication, 20:9, 1004-1013, DOI: [10.1080/10810730.2015.1018601](https://doi.org/10.1080/10810730.2015.1018601)

To link to this article: <https://doi.org/10.1080/10810730.2015.1018601>

 View supplementary material [↗](#)

 Published online: 29 Jul 2015.

 Submit your article to this journal [↗](#)

 Article views: 1679

 View related articles [↗](#)

 View Crossmark data [↗](#)

 Citing articles: 1 View citing articles [↗](#)

Exposure to Weight-Stigmatizing Media: Effects on Exercise Intentions, Motivation, and Behavior

REBECCA L. PEARL¹, JOHN F. DOVIDIO¹, REBECCA M. PUHL², and KELLY D. BROWNELL³

¹Department of Psychology, Yale University, New Haven, Connecticut, USA

²Rudd Center for Food Policy and Obesity, University of Connecticut, Hartford, Connecticut, USA

³Sanford School of Public Policy, Duke University, Durham, North Carolina, USA

This study aimed to evaluate the impact of exposure to weight-stigmatizing media on exercise intentions, motivation, and behavior, as well as to examine the interaction between this exposure and past experiences with weight stigma. A community sample of 72 women were randomly assigned to view a brief weight-stigmatizing or neutral video. Participants' choice of taking the stairs versus the elevator was observed before they completed measures of exercise intentions, motivation, and behavior; psychological well-being; and experiences with weight stigma. A follow-up survey was sent to participants 1 week later that assessed exercise behavior and intentions. Frequency of past weight stigma correlated with worse psychological well-being and more controlled (versus autonomous) exercise motivation. Significant interactions were found between past weight-stigmatizing experiences and exposure to the weight-stigmatizing video for outcomes of exercise intentions, behavior, and drive for thinness. Participants in the stigma condition with higher frequency of past experiences reported greater exercise intentions and behavior, along with higher drive for thinness. Past experiences of weight stigma interact with exposure to weight-stigmatizing media to increase exercise intentions and behavior, although this effect is accompanied by a heightened drive for thinness that may increase risk for long-term negative health consequences.

Weight stigma refers to the devaluing of individuals with overweight and obesity and forms the basis of discrimination in a number of life domains (Puhl & Heuer, 2009). Similar to other forms of stigma (Gibbons et al., 2010; Pascoe & Richman, 2009), experiencing weight stigma produces poor health outcomes. Consequences of weight stigma include unhealthy dietary behaviors and psychological difficulties such as body dissatisfaction, depression, low self-esteem, and drive for thinness (Ashmore, Friedman, Reichmann, & Musante, 2008; Brochu & Dovidio, 2014; Haines, Neumark-Sztainer, Eisenberg, & Hannan, 2006; Vartanian & Novak, 2011). These behaviors and psychological difficulties may contribute to long-term weight-cycling, weight gain, and other negative health consequences linked to experiences of weight stigma (Field, Manson, Taylor, Willett, & Colditz, 2004; Sutin & Terracciano, 2013; Williamson et al., 1995).

Weight Stigma in the Media

One domain in which weight stigma is highly prevalent is the media. The majority of news media portrayals of individuals with obesity are negative and stereotypical (e.g., portraying them as sedentary; Heuer, McClure, & Puhl, 2011; Puhl,

Peterson, DePierre, & Luedicke, 2013), and characters in popular media such as situation comedies, movies, and reality television are frequently targets of weight-based humor and stigmatization (Ata & Thompson, 2010; Fouts & Burggraf, 2000). For example, the reality television weight-loss competition *The Biggest Loser* has been criticized for portraying its contestants in a derogatory manner and perpetuating negative weight-based stereotypes (Thomas, Hyde, & Komesaroff, 2007). Considering the high consumption of media in the United States (*Statistical Abstract of the United States*, 2007), weight-stigmatizing media content may have the power to affect millions of people at once, highlighting the importance of understanding how media content influences public attitudes and public health.

These negative media portrayals can significantly influence public attitudes, because stereotypical images of individuals with obesity lead viewers to endorse negative weight-biased attitudes more strongly than do positive, non-stereotypical images (Carels et al., 2013; McClure, Puhl, & Heuer, 2011; Pearl, Puhl, & Brownell, 2012). Experimental research assessing public reactions to the reality television show *The Biggest Loser* reveals that viewing this show arouses greater dislike of overweight individuals (Domoff et al., 2012) and stronger attributions of weight to personal responsibility (which has been linked to greater weight bias; Yoo, 2013). In addition, an experimental study demonstrated another negative effect of weight-stigmatizing media: overweight women who were exposed to a compilation of

Address correspondence to Rebecca L. Pearl, Department of Psychology, Yale University, P.O. Box 208205, New Haven, CT 06520, USA. E-mail: rebecca.pearl@yale.edu

weight-stigmatizing media clips from popular television shows engaged more in a behavior associated with weight gain (specifically, consumed more calories) than participants who viewed a neutral video (Schvey, Puhl, & Brownell, 2011). Thus, stigmatizing images of individuals with obesity in the media appear to have a range of negative influences across people of different weight categories.

Despite its relevance to weight loss and to health generally, surprisingly little is known about the effects of weight-stigmatizing media on exercise. Many weight-loss focused programs are presented as inspiring portrayals aimed at promoting exercise to the general public, and it has been proposed that weight stigma could serve as a motivational tool for weight loss (Callahan, 2013). However, experimental research has revealed that viewing the television show *The Biggest Loser* led to more negative thoughts and feelings about exercise among college students of varying weight statuses (Berry, McLeod, Pankratow, & Walker, 2013). To our knowledge, no study to date has investigated the effects of weight-stigmatizing media on more proximal measures of exercise behavior. Given that the majority of Americans do not meet the recommended levels of physical activity (Tucker, Welk, & Beyler, 2011), and in light of evidence demonstrating that individuals with obesity engage in significantly less exercise than those within a healthy weight range (Spees, Scott, & Taylor, 2012), it is important to examine weight stigma—in terms of previous personal experiences and negative media portrayals—as a potential barrier to exercise intentions, motivation, and behavior among individuals across weight statuses.

Weight Stigma and Exercise

Evidence suggests that personal experiences of weight-stigmatization are associated with reduced exercise motivation and behavior. Several studies have linked retrospectively reported experiences of weight stigma to avoidance of exercise among children, adolescents, and adults, even when controlling for body mass index (BMI; Hayden-Wade et al., 2005; Puhl & Luedicke, 2012; Vartanian & Novak, 2011; Vartanian & Shaprow, 2008), as well as decreased caloric expenditure through physical activity and poorer weight-loss treatment outcomes (Wott & Carels, 2010). In addition, one study found that overweight women who were primed with a weight-based stereotype reported lower health intentions when controlling for BMI (Seacat & Mickelson, 2009). On the basis of this evidence, one might expect exposure to weight-stigmatizing media to similarly reduce women's exercise intentions, motivation, and behavior.

In contrast, other research suggests this relationship between weight stigma and exercise may be more complex. Some studies have not found a significant relationship between reports of current exercise behavior and past experiences with weight stigma (Vartanian & Novak, 2011; Vartanian & Shaprow, 2008), and other work has found a positive relation between retrospectively reported weight stigma and weight-loss outcomes (Latner, Wilson, Jackson, & Stunkard, 2009). Furthermore, there is a breadth of

research demonstrating links between exposure to appearance-focused media content (which could include weight-stigmatizing content) and poorer psychological well-being among women, including low self-esteem, body dissatisfaction, and drive for thinness (Dohnt & Tiggemann, 2006; Grabe, Ward, & Hyde, 2008). Drive for thinness, in turn, is associated with high amounts of exercise among individuals with eating disorders (Solenberger, 2001; Vansteelandt, Rijmen, Pieters, Probst, & Vanderlinden, 2007); therefore, it is possible that exposure to weight-stigmatizing media may instead lead to greater reports of exercise intentions, motivation, and behavior, because of this pathological drive for thinness encouraged by the media content.

Current Research

To clarify these conflicting hypotheses, as well as reconcile past mixed findings, the present research investigated how exposure to weight stigma, in past experiences and in present media exposure, affects exercise intentions, motivation, and behavior. The present study examined both elements within the same study design to identify potential insights about their joint effects. For example, similar to the manner in which prior trauma and stressful life events increase vulnerability to experiencing more severe responses to acute stressors (Brewin, Andrews, & Valentine, 2000; Hammen, 2005), it is possible that individuals who have experienced frequent weight-stigmatization in the past may demonstrate an amplified immediate response to weight stigma exposure. Thus, we would expect these individuals to report even less exercise motivation than individuals who have experienced weight stigma less frequently.

However, in light of (a) contradictory findings regarding weight-stigmatization and exercise and weight-loss outcomes, (b) evidence that weight-stigmatization leads to features of disordered eating, and (c) research suggesting exposure to appearance-focused media increases drive for thinness, an alternative hypothesis is possible. From this perspective, people who report experiencing greater past weight-stigmatization might report greater exercise intentions, motivation, and behavior when exposed to weight-stigmatizing media portrayals. The present study aimed to test both of these hypotheses by experimentally manipulating exposure to weight-stigmatizing media content and assessing its immediate and short-term effects on exercise outcomes and psychological well-being, as well as the interacting effect between this exposure and past encounters with weight stigma.

Method

Participants were 74 women recruited from the community surrounding a university via flyers and Craigslist postings advertising a study about how the media affects health. Only women were included in this study to be consistent with prior research (Vartanian & Shaprow, 2008), because the video stimulus only contained stigmatizing depictions of women, and because of evidence that women are particularly vulnerable to the consequences of weight bias (Puhl,

Andreyeva, & Brownell, 2008). We recruited women of diverse body weight categories because of our interest in identifying the effects of weight-stigmatizing media on the general public. All participants were prescreened by e-mail or phone to gather demographic information and ensure that participants were female.

Experimental Stimuli

Participants were randomly assigned to view a 10-min video that either featured weight-stigmatizing content or neutral content unrelated to weight. The stigmatizing video contained clips from popular television shows and movies that featured overweight women being mocked, humiliated, and disparaged for their weight. Clips were selected from popular situation comedies, primetime dramas, reality television shows, and movies that have reached millions of viewers, including *The Big Bang Theory*, *The Office*, *The Sopranos*, *The Biggest Loser*, *Precious*, and more. The neutral video contained clips from documentaries about topics such as nature, as well as commercials for products such as car insurance. These videos were developed and tested in prior relevant research (Schvey et al., 2011).

Measures

Manipulation Check

Participants completed nine items rated on a 5-point scale assessing their reactions to the video to ensure that the video content induced the intended reactions. A factor analysis of the items was conducted using varimax rotation, and two distinct factors emerged. Four items assessing the extent that the video made participants feel upset, anxious, and sad, and that they found the video to be stigmatizing, loaded onto a “negative reactions” factor (eigenvalue = 3.46, $R^2 = 38.47\%$, all factor loadings $>.60$); four items assessing responses such as enjoyment and positive affect loaded onto a “positive reactions” factor (eigenvalue = 2.16, $R^2 = 23.99\%$, factor loadings $>.60$). One item (“I could relate to the individuals in this video”) did not load strongly onto either factor, so it was analyzed as a separate item. Item scores were averaged to create summary scores for each factor (negative reactions $\alpha = .80$, positive reactions $\alpha = .77$).

Exercise Intentions, Motivation, and Behavior

Participants completed the Exercise Intention Scale (Jones, Sinclair, & Courneya, 2003), which consists of three items rated on a 7-point scale assessing intentions to exercise over the course of the coming week (in the present sample, $\alpha = .89$). Participants also completed the Exercise Avoidance-Motivation Scale (Vartanian & Shaprow, 2008), which consists of eight items rated on a 7-point scale assessing the degree to which participants report avoiding exercise (e.g., “I avoid going to the gym when I know there will be a lot of thin people there”; $\alpha = .79$).

In addition to assessing the magnitude of participants’ exercise motivation, the quality of their motivation was assessed with the Treatment Self-Regulation Questionnaire-Physical Activity (Wilson, Blanchard, Nehl, & Baker, 2006).

The questionnaire consists of eight items rated on a 7-point scale assessing internal versus external motivation to exercise (e.g., “It is an important choice I want to make”), and the items are grouped into two factors of autonomous motivation ($\alpha = .83$) versus controlled motivation ($\alpha = .74$). *Autonomous motivation* refers to motivation from personal volition and inherent enjoyment, versus *controlled motivation*, which develops through external demands and the desire to avoid negative feelings or judgment from others (Deci & Ryan, 2002; Ryan, 1995; Wilson et al., 2006). Given associations between autonomous motivation and long-term weight loss and exercise behavior (Silva et al., 2011; Standage, Sebire, & Loney, 2008; Williams, Grow, Freedman, Ryan, & Deci, 1996), in contrast with associations between controlled motivation and negative health outcomes such as body dissatisfaction and excessive exercise related to eating disorders (Mond, Hay, Rodgers, & Owen, 2006; Pelletier, Dion, & Levesque, 2004; Wilson et al., 2006), evaluating this quality of exercise motivation may provide significant information about long-term beneficial versus harmful consequences of weight stigma.

To examine exercise behavior separately from motivation, participants reported their current exercise behavior in the Godin Leisure-Time Questionnaire (Godin & Shephard, 1985). This measure assesses participants’ strenuous, moderate, and light exercise behavior during a typical week. Scores are computed by multiplying the frequency of each form of exercise by a fixed number and summing the products (Godin & Shephard, 1997).

Weight Stigma Experiences

Participants completed a modified version of the Stigmatizing Situations Inventory (Puhl & Brownell, 2006) that consisted of two sections of items, all rated on a 4-point scale. Section A contained 75 items asking participants to rate the frequency of weight-stigmatizing experiences in six life domains (e.g., in health care settings); subscales for each domain were computed and averaged to compute a total domain score ($\alpha = .87$). Section B asked participants to rate the frequency of experiencing weight-stigmatization by 21 different sources in their life (e.g., spouse; $\alpha = .87$). The domain and source scores were averaged to compute a total frequency of Stigmatizing Situations Inventory score.

Psychological Well-Being

Participants completed the Rosenberg Self-Esteem Scale (Rosenberg, 1979) and two subscales of the Eating Disorder Inventory (Garner, Olmstead, & Polivy, 1983). The Rosenberg Self-Esteem Scale consists of 10 items rated on a 4-point scale assessing participants’ levels of self-esteem ($\alpha = .89$). Participants completed the Eating Disorder Inventory’s subscales of body dissatisfaction (nine items; $\alpha = .83$) and drive for thinness (seven items; $\alpha = .89$). These scales are all rated on a 6-point scale; see Garner and colleagues (1983) for scoring instructions.

Follow-Up Questionnaire

The follow-up questionnaire contained the Godin Leisure-Time Questionnaire based on the past week’s exercise

behavior and the Exercise Intentions Scale based on intentions for the upcoming week.

Body Mass Index

Participants' weight was measured with a digital analogue scale in kilograms. Height was measured with a stadiometer to a tenth of a centimeter, and BMI was calculated from these measurements.

Procedure

When participants arrived at the psychology department building for the study, they were met by one of three female experimenters in the main entrance lobby before being escorted downstairs to a room in the basement. Informed consent was given, and participants were instructed to watch a short video and told that they would subsequently answer questions about the video and themselves.

After viewing the randomly assigned video, participants were informed that they would need to relocate to a different room to continue the study because of another researcher's need to use the laboratory space. As the experimenter packed up the study laptop, she informed the participant that the room was on another floor of the building, indicating that this was "several flights up." Participants were then informed that there was an elevator available before being asked, "Would you prefer to take the stairs or the elevator?" Experimenters were trained to use a casual tone when relaying this information and asking for this choice to avoid suspicion, and if participants hesitated or said they had no preference, experimenters responded with statements such as, "It's completely up to you" before asking the question again. The experimenter later recorded whether the participant chose to take the stairs or the elevator.

Once participants were in the second study room, the experimenter instructed participants to complete all of the study measures on the laptop while the experimenter sat outside the room. Participants then completed the Post-Video Questionnaire; Exercise Intentions and Exercise Avoidance-Motivation Scale (presented in a randomized order); the Godin Leisure-Time Questionnaire, Treatment Self-Regulation Questionnaire physical activity, Eating Disorder Inventory subscales, and Rosenberg Self-Esteem Scale (in randomized order); the Stigmatizing Situations Inventory; and a health and demographics questionnaire. When they were finished completing the surveys, the experimenter measured the participants' height and weight, provided \$15 compensation, and informed participants about the follow-up portion of the study.

One week following participation, participants received an email with a link to a 5-min follow-up survey to be completed online. Participants were informed that this survey was optional and compensation was a \$5 gift card to a national online retailer sent by e-mail. Participants who completed the follow-up survey received a complete debriefing. This study was approved by the university's institutional review board.

Data Analyses

To identify replication of previous findings regarding the relationship between weight stigma and health outcomes, correlations between frequency of past weight stigma experiences (Stigmatizing Situations Inventory scores) and all dependent measures addressing exercise intentions, motivation, and behavior, as well as psychological well-being were tested. Regression analyses were then conducted to determine the individual and interacting effects of exposure to weight-stigmatizing media content and past experiences with weight stigma. The dependent measures analyzed were reactions to the videos (as a manipulation check); exercise intentions, motivation, and behavior; and scales assessing psychological well-being, including drive for thinness.

Consistent with prior research (Vartanian & Novak, 2011), and because of the possibility that weight status would influence responses to weight-stigmatizing media content, BMI was included in the analyses. Thus, all regression models initially included BMI, experimental condition, and frequency of weight-stigmatizing experiences in the first step, all two-way interactions in the second step, and the three-way interaction in the third step. However, because of the nonsignificance of the three-way interaction and two-way interactions that included BMI, the results presented only include BMI (as a covariate), condition, stigma frequency, and the interaction term between condition and frequency of past weight-stigmatizing experiences.¹ Simple slopes analyses were conducted if this interaction term was significant.

Results

Participant Characteristics

One participant was excluded because of a physical disability that prevented her from using the stairs; another person identified the purpose of the study to the experimenter. The remaining 72 participants were between the ages of 18 and 59 years ($M = 27.15$, $SD = 10.93$), and the sample was racially and ethnically diverse (43% White non-Hispanic; 28% African American; 11% Asian or Pacific Islander; 8% Mexican-American, Latino, or Hispanic; 10% Other). The majority of participants reported completing at least some college (83%), and the mean BMI was 26.73 kg/m² ($SD = 7.87$; range = 16.2–52.4; 45.8% with BMIs of 25 or greater). Means and standard deviations for all variables are presented in Table 1. No differences emerged in participant characteristics (including current exercise behavior) by condition, and outcome measures did not differ by experimenter. Of the 72 participants, 50 completed the follow-up survey, providing a return rate of 69%. There were no differences in measures of exercise motivation, behavior, or psychological well-being between participants who did and did not complete the follow-up survey.

¹Analyses were also conducted with a variable for categorical weight status (overweight vs. nonoverweight) instead of BMI, and none of the interaction terms were statistically significant.

Table 1. Means and correlations (and partial correlations) between frequency of stigmatizing experiences and dependent measures

Variables	M (SD)	Exercise intentions	Exercise avoidance	Exercise behavior	Autonomous motivation	Controlled motivation	Self-esteem	Drive for thinness	Body dissatisfaction
Stigmatizing situations	1.29 (0.32)	.11 (-.07)	.17 (.26 ⁺)	-.06 (-.05)	.04 (-.13)	.34** (.24 ⁺)	-.23 [^] (-.21 ⁺)	.10 (-.02)	.34* (.19)
Body dissatisfaction	8.61 (6.12)	.01 (-.10)	.48** (.57**)	-.17 (-.18)	-.03 (-.14)	.37** (.31 ⁺)	-.38** (-.42**)	.48** (.46**)	
Drive for thinness	5.08 (5.74)	.22 ⁺ (.14)	.30 (.36**)	.11 (.08)	.07 (.02)	.48** (.47**)	.23 ⁺ (-.24 [^])		
Self-esteem	2.19 (0.54)	.14 (.16)	-.30 (-.37**)	.17 (.20)	.27* (.32**)	-.22 ⁺ (-.25 ⁺)			
Controlled motivation	3.75 (1.41)	.25* (.17)	.27* (.36**)	.21 ⁺ (.20)	.19 (.09)				
Autonomous motivation	6.23 (0.78)	.53** (.51**)	-.24* (-.23 ⁺)	.34** (.39**)					
Exercise behavior	61.63 (24.28)	.61** (.63**)	-.19 (-.17)						
Exercise avoidance	2.39 (1.05)	-.31** (-.39 ⁺)							

Note. For exercise intentions, $M = 4.42$ ($SD = 1.67$). Parentheses indicate partial correlations when controlling for body mass index. ⁺ $p < .10$. [^] $p < .055$. * $p \leq .05$. ** $p \leq .01$.

Correlations of Weight-Stigmatizing Experiences

Three participants did not complete the Stigmatizing Situations Inventory, so all analyses were conducted with a total of 69 participants. As expected, frequency of weight-stigmatizing encounters was significantly correlated with BMI, $r(67) = .56, p < .001$, so consistent with prior relevant research (Vartanian & Novak, 2011), BMI was controlled for in all subsequent analyses, and correlations with other variables were computed with and without controlling for BMI (see Table 1). When BMI was not controlled for, scores on the Stigmatizing Situations Inventory were significantly correlated with higher body dissatisfaction, more controlled exercise motivation, and marginally lower self-esteem; when BMI was controlled for, partial correlations emerged for scores with higher exercise avoidance, more controlled exercise motivation, and marginally lower self-esteem, thus supporting the initial hypothesis that past weight-stigmatization would be associated with less exercise motivation and psychological well-being.

Manipulation Check

Multiple regression analyses with condition and Stigmatizing Situations Inventory scores as the predictor variables (controlling for BMI) and the two reactions factors as the dependent variables confirmed that the experimental stimuli led to the anticipated responses. The stigmatizing video led to higher negative reactions scores and lower positive reactions scores, particularly for individuals who reported higher frequency of past weight-stigmatizing experiences (see Supplementary Material for statistical output).

The item “I could relate to the individuals in this video” (within the stigma condition only, as this was most relevant) did not significantly correlate with past weight-stigmatizing experiences, $r(34) = .33, p = .059$, but it significantly correlated with BMI, $r(36) = .53, p = .001$, indicating that participants with higher BMIs identified more strongly with the targets of weight-stigmatization in the video.

Exercise Intentions, Motivation, and Behavior

Exercise intentions were significantly correlated with Godin Leisure-Time Questionnaire and Treatment Self-Regulation Questionnaire autonomous scores with and without controlling for BMI, and inversely related to exercise avoidance (see Table 1). Exercise avoidance was significantly associated with body dissatisfaction, drive for thinness, and Treatment Self-Regulation Questionnaire controlled scores, and inversely correlated with Rosenberg Self-Esteem Scale scores. Consistent with prior research, Treatment Self-Regulation Questionnaire autonomous scores significantly and positively correlated with Godin Leisure-Time Questionnaire and Rosenberg Self-Esteem Scale scores, while Treatment Self-Regulation Questionnaire controlled scores were positively correlated with body dissatisfaction and drive for thinness scores, and inversely associated with Rosenberg Self-Esteem Scale scores.

Table 2. Multiple linear regression output for exercise intentions, follow-up measures, and drive for thinness

Predictor variable	Exercise intentions		Follow-up Godin Leisure-Time Questionnaire		Follow-up exercise intentions		Drive for thinness		
	Model R ²	Step 1	Step 2	Model R ²	Step 1	Step 2	Model R ²	Step 1	Step 2
Body mass index	0.14	0.42	0.51*	0.15	-0.17	-0.09	0.11	1.01	1.30
Condition		-0.16	-0.13		-0.21	-0.20		-0.99	-0.87
Stigmatizing Situation		-0.05	-0.44		0.37	-0.34		-0.05	-1.35
Inventory									
Condition × Stigmatizing Situation Inventory			1.04*						3.49*

Note. Body mass index and Stigmatizing Situation Inventory scores were standardized as Z scores. Condition was dummy-coded; the neutral condition serves as the reference group. Standardized beta coefficients are reported.
**p* ≤ .05.

Intentions

Results are presented in Table 2. The interaction between condition and past experiences with weight stigma was significant (*p* = .016). Simple slopes analyses (see Figure 1) revealed that frequency of weight stigma in the neutral condition tended to be negatively associated with exercise intentions, a finding that was supported by the initial hypothesis; however, consistent with the alternative hypothesis that a history of weight-stigmatization would lead to a greater drive to exercise when exposed to weight-stigmatizing media, frequency of weight stigma in the stigma condition was significantly positively associated with exercise intentions.

Motivation and Behavior

To assess whether media exposure to weight stigma and frequency of past weight-stigmatizing experiences could affect other aspects of exercise motivation, the aforementioned regression analysis was repeated with the Exercise Avoidance-Motivation Scale and Treatment Self-Regulation Questionnaire subscales as dependent measures. No significant main effects or interactions were found.

Binomial regression analysis was conducted to test the effect of video condition and frequency of weight stigma on the elevator versus stairs choice, which served as a proxy measure of spontaneous physical activity. No significant differences in the elevator versus stairs choice emerged in association with any of the included variables. Overall, 22.2% of participants chose the elevator: 27.8% of participants chose the elevator in the neutral condition, while 16.7% chose the elevator in the stigma condition. Relative percentages were similar when examining behavior by participant weight status: overweight (BMI ≥ 25), neutral = 37.5%, stigma = 23.5%; nonoverweight (BMI < 25), neutral = 20%, stigma = 10.5%.

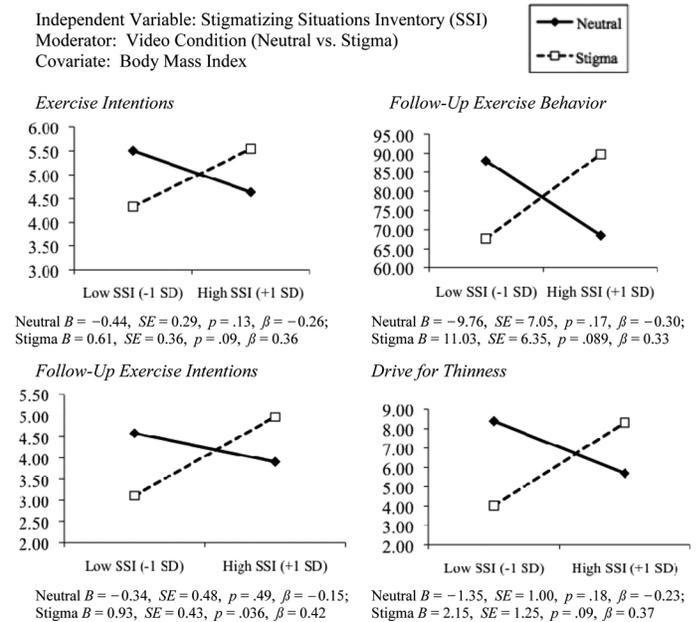


Fig. 1. Unstandardized plots of simple slopes.

Follow-Up Data

The effect of condition and frequency of past weight stigma on exercise behavior and intentions over the following week was explored by analyzing data from the follow-up questionnaire. Since there were no initial differences in Godin Leisure-Time Questionnaire scores between groups, it was assumed that differences in follow-up reports of exercise behavior would reflect effects of the experimental manipulation (watching the stigmatizing video). Thus, multiple linear regression analysis including Stigmatizing Situations Inventory scores, condition, and the interaction was conducted for follow-up Godin Leisure-Time Questionnaire scores, and the results are displayed in Table 2. The interaction between condition and frequency of weight stigma was significant ($p = .029$). Simple slopes analyses (see Figure 1) revealed that, as expected, higher frequency of past experiences of weight stigma predicted less exercise behavior in the following week in the neutral condition; however, consistent with the alternative hypothesis, higher frequency of stigma predicted more exercise behavior in the stigma condition than the neutral condition.

Similarly, Exercise Intentions reported in the follow-up survey were analyzed with the same models (results are displayed in Table 2). A significant interaction between condition and Stigmatizing Situations Inventory scores emerged ($p = .048$). Simple slopes analyses demonstrated that although participants in the neutral condition who had higher frequency of weight-stigmatizing experiences expressed lower (though not significantly) exercise intentions one week later, frequency of weight-stigmatizing experiences was associated with significantly greater exercise intentions for participants in the stigma condition (see Figure 1).

Psychological Well-Being

Multiple linear regression models were also constructed to test the effect of condition and frequency of weight stigma on each variable of psychological well-being. Of the psychological variables, only drive for thinness was significantly affected by condition and frequency of weight stigma (see Table 2). There was a significant interaction between condition and frequency of weight stigma ($p = .022$), and simple slopes analyses revealed that although in the neutral condition weight stigma frequency was associated with lower drive for thinness, in the stigmatizing condition, greater frequency of past weight-stigmatizing experiences was associated with higher drive for thinness scores, thus supporting the hypothesis that exposure to both weight-stigmatizing media and weight stigma in past experiences leads to magnified negative effects on psychological well-being (see Figure 1).

Discussion

The present research revealed an overall negative effect of previous weight-stigmatizing experiences for women, regardless of their current weight status, but further demonstrated that exposure to weight-stigmatizing media has different

effects depending on these previous experiences. Consistent with prior research (Puhl & Heuer, 2010; Vartanian & Novak, 2011), frequency of past weight stigmatization was associated with lower self-esteem and greater body dissatisfaction and exercise-avoidance motivation. Furthermore, past experiences with weight stigma correlated with greater controlled exercise motivation, which in turn was associated with higher body dissatisfaction and drive for thinness, but not current exercise behavior. These associations suggest that experiences of weight stigma may contribute to worse psychological functioning and attitudes toward exercise that do not promote engagement in physical activity.

Although there were no consistent main effects for media exposure, investigation of the interaction between past experiences with and present media exposure to weight stigma revealed results that were concordant with the alternative hypothesis. For participants who had previously experienced weight stigma, stigmatizing media exposure triggered a short-term increase in intentions and (self-reported) behavior. This effect could account for prior observations of initial short-term weight-loss among obesity-treatment patients who had experienced past weight-stigmatization (Latner et al., 2009), particularly if aspects of treatment were experienced as acutely stigmatizing. Consistent with evidence that stereotypes involve both automatic and controlled processes (Devine, 1989), it is possible that the weight-stigmatizing video automatically activated negative stereotypes (e.g., that overweight women are lazy), which motivated participants to distance themselves (consciously or unconsciously) from those stereotypes by reporting increased exercise. Of note, there was no effect of condition or past experiences of weight-stigmatization on spontaneous physical activity, supporting the conceptualization of exercise as a planned behavior based on intentions rather than a spontaneous one (Norman & Conner, 2005).

A noteworthy study outcome is the predicted amplified negative effect of the interaction between past experiences with and media exposure to weight stigma on drive for thinness. The effect of both the video and a history of weight-stigmatization on drive for thinness is consistent with prior evidence that weight-based criticism and media consumption are associated with higher drive for thinness among young girls and women (Harrison & Cantor, 1997; Striegel-Moore, Schreiber, Pike, Wilfley, & Rodin, 1995), and this finding may provide insight into the outcomes for exercise intentions and behavior. Drive for thinness prospectively predicts long-term development of eating disorder symptoms (Dobmeyer & Stein, 2003), and it has specifically been linked to high amounts of exercise among patients with severe eating disorders (Solenberger, 2001; Vansteelandt et al., 2007). Furthermore, among women who exercise, drive for thinness is an indicator of chronic energy deficiency, which is a marker of amenorrhea, bone loss, and risk of stress fractures (DeSouza, Hontscharuk, Olmstead, Kerr, & Williams, 2007).

Given these empirical findings linking drive for thinness to unhealthy exercise behaviors, it is possible that the increase in exercise intentions and behavior among

individuals in the stigma condition who reported frequent weight-stigmatizing experiences may reflect an unhealthy drive to exercise that, in the long-term, could lead to negative health outcomes. This explanation is also supported by the observed correlations between drive for thinness and both exercise avoidance and controlled motivation in this study, which are indicative of impaired exercise motivation. Thus, if the exercise following stigmatization has a pathological quality, this finding suggests that while the short-term consequences of weight-stigmatization seem to enhance exercise behavior (and weight-loss outcomes), the long-term consequences could be detrimental to health. Future research should focus more directly on the nature of the exercise motivation and behavior resulting from weight-stigmatization, as well as extend the follow-up assessment period to capture the long-term effects of exposure.

This study was novel in its use of experimental manipulation of weight-stigmatizing media exposure to investigate its causal effects on exercise and psychological well-being. Another strength was its inclusion of observational and self-report measures of exercise behavior, rather than relying solely on measures of intentions and motivation, as well as its assessment of the behavior that occurred in a short period of time following exposure to weight stigma. Future research could prospectively track individuals' exercise behavior over time following instances of weight-stigmatization to better understand the immediate versus long-term responses to stigma.

The conclusions drawn from this study were based on self-report data, which may be biased by social desirability to appear physically active; however, a social desirability explanation would not account for the observed interaction effects. The sample size also limited the power for statistical analyses, and despite small to medium effect sizes, several simple slopes analyses failed to reach statistical significance. However, the emergence of significant effects even with the present sample size highlights the potency of the effect of weight stigma on exercise and psychological functioning. In addition, although pretest measures were not administered, the use of random assignment allows for conclusions about the causal impact of the experimental stimuli, and its effect on drive for thinness (typically considered a trait measure) is particularly striking given the brevity of the exposure. The neutral video contained more nonfiction clips than did the stigmatizing video and thus may have been less entertaining for participants. The present study failed to find a moderating effect of body weight on outcomes, but participants with higher BMIs did report identifying more strongly with the targets of weight stigma in the video. Thus, while weight-stigmatizing media may have negative effects on the general public, it is worth investigating how individuals with overweight and obesity in particular may experience and react to this form of weight stigma.

Several important implications for fitness settings, clinical and public health approaches, and media practice follow from the current findings. The idea that weight stigma may motivate engagement in health behaviors, including exercise (Callahan, 2013), has been used as justification for shaming

and potentially harmful tactics used by health-care providers, fitness trainers and educators, and antiobesity public health campaigns (Chambliss & Blair, 2005; Fabricatore, Wadden, & Foster, 2005; Puhl, Peterson, & Luedicke, 2012). The findings from this study may illuminate at least one mechanism in the perpetuation of this misguided societal belief: certain individuals may exhibit short-term increases in exercise motivation and behavior immediately following exposure to weight stigma (whether it be a critical or degrading comment by a clinician or trainer), which could be perceived as a sign that stigmatizing strategies might be useful. However, in light of the considerable previous research consistently documenting negative psychological and physical health effects of weight stigma, it is crucial to consider the potential long-term consequences that may follow from an apparent short-term exercise boost, such as eating pathology, to provide accurate information to health and fitness professionals about the broader effect of stigma on health. Overall, health practitioners should avoid using stigma as a motivational tool, considering the potentially negative long-term consequences and broader health implications.

These findings also raise concern about the potentially negative effect of weight-stigmatizing media content on exercise motivation and behavior, especially given the pervasiveness of this content in mainstream media. Future research could identify and compare what types of media content are most motivating for health behaviors such as exercise, to determine what kinds of media content could be adopted to better promote exercise and health without eliciting the negative consequences associated with stigmatization.

Funding

This research was funded by the Yale Rudd Center for Food Policy and Obesity.

Supplemental Material

A supplemental appendix (Tables A and B) can be accessed at <http://dx.doi.org/10.1080/10810730.2015.1018601>.

References

- Ashmore, J. A., Friedman, K. E., Reichmann, S. K., & Musante, G. J. (2008). Weight-based stigmatization, psychological distress, & binge eating behavior among obese treatment-seeking adults. *Eating Behaviors, 9*, 203–209.
- Ata, R. N., & Thompson, J. K. (2010). Weight bias in the media: A review of recent research. *Obesity Facts, 3*, 41–46.
- Berry, T. R., McLeod, N. C., Pankratow, M., & Walker, J. (2013). Effects of *Biggest Loser* exercise depictions on exercise-related attitudes. *American Journal of Health Behavior, 37*, 96–103.
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*, 748–766.
- Brochu, P. M., & Dovidio, J. F. (2014). Would you like fries (380 calories) with that? Menu labeling mitigates the impact of weight-based stereotype threat on food choice. *Social Psychological and Personality Science, 5*(4), 414–421.

- Callahan, D. (2013). Obesity: Chasing an elusive epidemic. *Hastings Center Report*, 43, 34–40.
- Carels, R. A., Hinman, N. G., Burmeister, J. M., Hoffman, D. A., Ashrafioun, L., & Koball, A. M. (2013). Stereotypical images and implicit weight bias in overweight and obese people. *Eating and Weight Disorders*, 18, 441–445.
- Chambliss, H. O., & Blair, S. N. (2005). Improving the fitness landscape. In K. D. Brownell, R. M. Puhl, M. B. Schwartz, & L. Rudd (Eds.), *Weight bias: Nature, consequences, and remedies* (pp. 248–264). New York, NY: Guilford Press.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. New York, NY: University of Rochester Press.
- DeSouza, M. J., Hontscharuk, R., Olmstead, M., Kerr, G., & Williams, N. I. (2007). Drive for thinness score is a proxy indicator of energy deficiency in exercising women. *Appetite*, 48, 359–367.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, 56, 5–18.
- Dobmeyer, A. C., & Stein, D. M. (2003). A prospective analysis of eating disorder risk factors, drive for thinness, depressed mood, maladaptive cognitions, and ineffectiveness. *Eating Behaviors*, 4, 135–147.
- Dohnt, H., & Tiggemann, M. (2006). Contribution of peer and media influences to the development of body satisfaction and self-esteem in young girls: A prospective study. *Developmental Psychology*, 42, 929–936.
- Domoff, S. E., Hinman, N. G., Koball, A. M., Storf-Isser, A., Carhart, V. L., Baik, K. D., & Carels, R. A. (2012). The effects of reality television on weight bias: An examination of *The Biggest Loser*. *Obesity*, 20, 993–998.
- Fabricatore, A. N., Wadden, T. A., & Foster, G. D. (2005). Bias in health care settings. In K. D. Brownell, R. M. Puhl, M. B. Schwartz, & L. Rudd (Eds.), *Weight bias: Nature, consequences, and remedies* (pp. 29–41). New York, NY: Guilford Press.
- Field, A. E., Manson, J. E., Taylor, C. B., Willett, W. C., & Colditz, G. A. (2004). Association of weight change, weight control practices, and weight cycling among women in the Nurses' Health Study II. *International Journal of Obesity*, 28, 1134–1142.
- Fouts, G., & Burggraf, K. (2000). Television situation comedies: Female weight, male comments, and audience reactions. *Sex Roles*, 42, 925–932.
- Garner, D. M., Olmstead, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2, 15–34.
- Gibbons, F. X., Etcheverry, P. E., Stock, M. L., Gerrard, M., Weng, C. Y., Kiviniemi, M., & O'Hara, R. E. (2010). Exploring the link between racial discrimination and substance use. What mediates? What buffers? *Journal of Personality and Social Psychology*, 99, 785–801.
- Godin, G., & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sports Sciences*, 10, 141–146.
- Godin, G., & Shephard, R. J. (1997). Godin leisure-time exercise questionnaire. *Medicine & Science in Sports & Exercise*, S29, S36–S38.
- Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin*, 134, 460–476.
- Haines, J., Neumark-Sztainer, D., Eisenberg, M. E., & Hannan, P. J. (2006). Weight teasing and disordered eating behaviors in adolescents: Longitudinal findings from Project EAT (Eating Among Teens). *Pediatrics*, 117, e209–e215.
- Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology*, 1, 293–319.
- Harrison, K., & Cantor, J. (1997). The relationship between media consumption and eating disorders. *Journal of Communication*, 47, 40–67.
- Hayden-Wade, H. A., Stein, R. I., Ghaderi, A., Saelens, B. E., Zabinski, M. F., & Wilfley, D. E. (2005). Prevalence, characteristics, and correlates of teasing experiences among overweight children vs. non-overweight peers. *Obesity Research*, 13, 1381–1392.
- Heuer, C. A., McClure, K. J., & Puhl, R. M. (2011). Obesity stigma in online news: A visual content analysis. *Journal of Health Communication*, 16, 976–987.
- Jones, L. W., Sinclair, R. C., & Courneya, K. S. (2003). The effects of source credibility and message framing on exercise intentions, behaviors, and attitudes: An integration of the elaboration likelihood model and prospect theory. *Journal of Applied Social Psychology*, 33, 179–196.
- Latner, J. D., Wilson, G. T., Jackson, M. L., & Stunkard, A. J. (2009). Greater history of weight-related stigmatizing experience is associated with greater weight loss in obesity treatment. *Journal of Health Psychology*, 14, 190–199.
- McClure, K. J., Puhl, R. M., & Heuer, C. A. (2011). Obesity in the news: Do photographic images of obese persons influence antifat attitudes? *Journal of Health Communication*, 16, 359–371.
- Mond, J. M., Hay, P. J., Rodgers, B., & Owen, C. (2006). Update on the definition of "excessive exercise" in eating disorders research. *International Journal of Eating Disorders*, 39, 147–153.
- Norman, P., & Conner, M. (2005). The theory of planned behavior and exercise: Evidence for the mediating and moderating roles of planning on intention-behavior relationships. *Journal of Sport & Exercise Psychology*, 27, 488–504.
- Pascoe, E. A., & Richman, L. S. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin*, 135, 531–554.
- Pearl, R. L., Puhl, R. M., & Brownell, K. D. (2012). Positive media portrayals of obese persons: Impact on attitudes and image preferences. *Health Psychology*, 31, 821–829.
- Pelletier, L. G., Dion, S., & Levesque, C. (2004). Can self-determination help protect women against sociocultural influences about body image and reduce their risk of experiencing bulimic symptoms? *Journal of Social and Clinical Psychology*, 23, 61–88.
- Puhl, R. M., Andreyeva, T., & Brownell, K. D. (2008). Perceptions of weight discrimination: Prevalence and comparison to race and gender discrimination in America. *International Journal of Obesity*, 32, 992–1000.
- Puhl, R. M., & Brownell, K. D. (2006). Confronting and coping with weight stigma: An investigation of overweight and obese adults. *Obesity*, 14, 1802–1815.
- Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: A review and update. *Obesity*, 17, 941–964.
- Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: Important implications for public health. *American Journal of Public Health*, 100, 1019–1028.
- Puhl, R. M., & Luedicke, J. (2012). Weight-based victimization among adolescents in the school setting: Emotional reactions and coping behaviors. *Journal of Youth and Adolescence*, 41, 27–40.
- Puhl, R. M., Peterson, J. L., DePierre, J. A., & Luedicke, J. (2013). Headless, hungry, and unhealthy: A video content analysis of obese persons portrayed in online news. *Journal of Health Communication*, 18, 686–702.
- Puhl, R. M., Peterson, J. L., & Luedicke, J. (2012). Fighting obesity or obese persons? Public perceptions of obesity-related health messages. *International Journal of Obesity*, 37(6), 774–782.
- Rosenberg, M. (1979). *Conceiving the self*. New York, NY: Basic Books.
- Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality*, 63, 397–428.
- Schvey, N. A., Puhl, R. M., & Brownell, K. D. (2011). The impact of weight stigma on caloric consumption. *Obesity*, 19, 1957–1962.
- Seacat, J. D., & Mickelson, K. D. (2009). Stereotype threat and the exercise/dietary health intentions of overweight women. *Journal of Health Psychology*, 14, 556–567.

- Silva, M. N., Markland, D., Carraça, E. V., Vieira, P. N., Coutinho, S. R., Minderico, C. S., . . . Teixeira, P. J. (2011). Exercise autonomous motivation predicts 3-yr weight loss in women. *Medicine & Science in Sports & Exercise*, *43*, 728–737.
- Solenberger, S. E. (2001). Exercise and eating disorders: A 3-year inpatient hospital record analysis. *Eating Behaviors*, *2*, 151–168.
- Spees, C. K., Scott, J. M., & Taylor, C. A. (2012). Differences in amounts and types of physical activity by obesity status in us adults. *American Journal of Health Behavior*, *36*, 56–65.
- Standage, M., Sebire, S. J., & Loney, T. (2008). Does exercise motivation predict engagement in objectively assessed bouts of moderate-intensity exercise?: A self-determination theory perspective. *Journal of Sport & Exercise Psychology*, *30*, 337–352.
- Striegel-Moore, R. H., Schreiber, G. B., Pike, K. M., Wilfley, D. E., & Rodin, J. (1995). Drive for thinness in Black and White preadolescent girls. *International Journal of Eating Disorders*, *18*, 59–69.
- Sutin, A. R., & Terracciano, A. (2013). Perceived weight discrimination and obesity. *PLoS ONE*, *8*.
- Thomas, S., Hyde, J., & Komesaroff, P. (2007). “Cheapening the struggle:” Obese people’s attitudes towards *The Biggest Loser*. *Obesity Management*, *3*, 210–215.
- Tucker, J. M., Welk, G. J., & Beyler, N. K. (2011). Physical activity in U.S.: Adults compliance with the Physical Activity Guidelines for Americans. *American Journal of Preventive Medicine*, *40*, 454–461.
- U.S. Census Bureau. (2007). *Statistical abstract of the United States*. Washington, DC: Author.
- Vansteelandt, K., Rijmen, F., Pieters, G., Probst, M., & Vanderlinden, J. (2007). Drive for thinness, affect regulation and physical activity in eating disorders: A daily life study. *Behaviour Research and Therapy*, *45*, 1717–1734.
- Vartanian, L. R., & Novak, S. A. (2011). Internalized societal attitudes moderate the impact of weight stigma on avoidance of exercise. *Obesity*, *19*, 757–762.
- Vartanian, L. R., & Shaprow, J. G. (2008). Effects of weight stigma on exercise motivation and behavior: a preliminary investigation among college-aged females. *Journal of Health Psychology*, *13*, 131–138.
- Williams, G. C., Grow, V. M., Freedman, Z. R., Ryan, R. M., & Deci, E. L. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology*, *70*, 115–126.
- Williamson, D. A., Lawson, O. J., Brooks, E. R., Wozniak, P. J., Ryan, D. H., Bray, G. A., & Duchman, E. G. (1995). Association of body mass with dietary restraint and disinhibition. *Appetite*, *25*, 31–41.
- Wilson, P. M., Blanchard, C. M., Nehl, E., & Baker, F. (2006). Predicting physical activity and outcome expectations in cancer survivors: an application of self-determination theory. *Psycho-Oncology*, *15*, 567–578.
- Wott, C. B., & Carels, R. A. (2010). Overt weight stigma, psychological distress and weight loss treatment outcomes. *Journal of Health Psychology*, *15*, 608–614.
- Yoo, J. H. (2013). No clear winner: Effects of *The Biggest Loser* on the stigmatization of obese persons. *Health Communication*, *28*, 294–303.