The Effects of Reality Television on Weight Bias: An Examination of *The Biggest Loser*

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Weight-loss reality shows, a popular form of television programming, portray obese individuals and their struggles to lose weight. While the media is believed to reinforce obesity stereotypes and contribute to weight stigma, it is not yet known whether weight-loss reality shows have any effect on weight bias. The goal of this investigation was to examine how exposure to 40-min of *The Biggest Loser* impacted participants' levels of weight bias. Fifty-nine participants (majority of whom were white females) were randomly assigned to either an experimental (one episode of *The Biggest Loser*) or control (one episode of a nature reality show) condition. Levels of weight bias were measured by the Implicit Associations Test (IAT), the Obese Person Trait Survey (OPTS), and the Anti-fat Attitudes scale (AFA) at baseline and following the episode viewing (1 week later). Participants in *The Biggest Loser* condition had significantly higher levels of dislike of overweight individuals and more strongly believed that weight is controllable after the exposure. No significant condition effects were found for implicit bias or traits associated with obese persons. Exploratory analyses examining moderation of the condition effect by BMI and intention to lose weight indicated that participants who had lower BMIs and were not trying to lose weight had significantly higher levels of dislike of overweight individuals following exposure to *The Biggest Loser* compared to similar participants in the control condition. These results indicate that anti-fat attitudes increase after brief exposure to weight-loss reality television.

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INTRODUCTION

Weight bias and discrimination is pervasive and increasingly well-documented (1). Negative attitudes toward obese individuals are evident among employers, health care professionals, educators, family members, romantic partners, friends, and the media (1,2). The physical and psychological costs of weight bias are significant (3–5).

In a recent review of the literature on weight bias in the media, Ata and Thompson (6) found that anti-fat attitudes were being reinforced in children's television shows, movies, and books, as well as in adolescent- and adult-targeted television, weight-loss programming, news coverage, and websites (e.g., YouTube). For example, in television shows, characters who are obese are underrepresented in leading roles, less frequently presented in romantic or positive interactions, less likely to be presented as attractive, charming, or smart, and are often denigrated or behave in a manner that perpetuates common obesity myths (e.g., laziness, gluttonous; ref. (2,6–8)).

Ata and Thompson (6) further suggested that reality television show portrayals of obese individuals, such as in *The Biggest Loser*, often fuel anti-fat attitudes and stereotyping. *The Biggest Loser* is one of the most popular reality television shows that exclusively features obese individuals. Contestants compete to win $250,000 by losing the most weight through a grueling exercise and restrictive eating regimen. This television show first aired in the United States in 2004, is currently in its thirteenth season, and has several million viewers weekly (9–11). *The Biggest Loser* is among the most popularly rated shows watched among viewers 18- to 49-years-old (11) and is the precursor to several reality weight-loss television shows (12).

Despite clearly promoting weight loss among its contestants, *The Biggest Loser's* impact on attitudes toward obese individuals is unclear. Some suggest that shows like *The Biggest Loser* perpetuate the unrealistic view that significant weight loss is possible through adequate willpower and hard work (12,13). Greater belief in the controllability of weight has been consistently associated with greater weight bias (14). Others suggest that reality programming like *The Biggest Loser* uses "scare tactics" to promote a fear of fat and idealization of thinness (e.g., fear of developing habits or body shapes such as those portrayed on the show; ref. (15)). However, others argue that the show promotes healthy lifestyle changes for obese individuals, and that it may serve as an inspiration and motivator for those trying to become healthier (12). In one of the few studies examining individuals' attitudes toward *The Biggest Loser*, the majority of obese Australian respondents participating in a qualitative

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study viewed the basic concept of the show negatively, believing that it portrayed stereotypical character traits of obesity, promoted individual responsibility for weight (as opposed to genetic or environmental factors), and gave unattainable, unrealistic, and unaffordable weight-loss solutions (16).

The current study was designed to examine the effects of watching 40 min (the equivalent to a 1 h episode without commercials) of the reality show *The Biggest Loser* on dislike of obese individuals, attributions of controllability of weight, obese person stereotypes, and implicit weight bias. To comprehensively assess weight bias, we sought to assess multiple types of bias (explicit and implicit bias; dislike and controllability of weight; positive and negative stereotypes). We were also interested in exploring how participants' own weight and weight-loss intentions may moderate the impact of the show on attitudes toward obese individuals.

METHODS AND PROCEDURES

Participants

Sixty-four adults were recruited from undergraduate psychology classes at a Midwestern University through an online experiment recruitment system. Participants received class credit for participation in the study. This investigation received full approval from, and was in accordance with, the University's human subjects review board. The mean age of participants was 20.0 years (s.d. = 2.9 years) and approximately two-thirds of the participants were female (66.1%) and white (69.5%). Other participants self-identified as African American or Black (23.7%), Asian American or Pacific Islander (3.4%), or Hispanic or Latino/a (3.4%). Mean BMI was 25.8 (s.d. = 4.6).

Study design

The purpose of the study was advertised as the "Effect of media consumption on processing" in order to disguise the true nature of the study. Processing speed was chosen as a distractor variable so that the Implicit Associations Test (IAT) could be labeled as a test of processing speed (and thus, mask the experimenters' intent to measure bias). Distractor items related to processing speed (e.g., "I process information quickly"), with response choices on a five-point Likert scale ranging from "strongly disagree" to "strongly agree", were inserted throughout the pre- and post-test surveys to further conceal the study's true purpose. Additional distractor questions assessed media consumption, specifically regarding frequency of viewing popular reality television shows (e.g., American Idol, Jersey Shore). These distractor items assisted in conveying the rationale that this study was investigating how reality shows affect one's processing speed. Finally, participants were told that the video clip they watched was randomly selected from the list of reality shows for which frequency of viewing was previously measured.

Participants completed one 30-min session followed a week later by one 90-min session. During the first session, participants completed an electronic version of the IAT (17) and online questionnaires (including measures of explicit bias), the order of which was counter-balanced. Participants worked independently at individual computers in a computer lab. Poster boards were erected in between computers to block participants' ability to see or be influenced by the images shown on surrounding computers.

During the second session, participants were randomly assigned to view a 40-min portion of the reality television show *The Biggest Loser* (Season 7, Episode 17) or a control video clip from the nature reality television show, *Meerkat Manor* (Season 4, Episodes 1 and 4). This *Biggest Loser* episode was chosen because it was representative of a typical episode of this show: it included contestants describing their struggle with weight loss (i.e., lifetime weight fluctuations, previous dieting attempts, and health risks), depicted contestants vigorously exercising and dieting, and had scenes where contestants described the benefits of their losing weight. The episode also contained flashbacks of the contestants at the beginning of the season to portray progress concerning weight loss, health gains, and improvements in self-esteem and body image. Three of the five contestants portrayed in this episode were men, two were women, and each contestant was allotted approximately equal air-time. The show's trainers (one male and one female) generally offered appropriate support and encouragement, emphasizing contestant's ability to lose weight through hard work.

The nature reality show was chosen to control for the effect of watching reality television on subsequent attitude change, while presenting a neutral viewing stimuli. Using a nonhuman television show reduced the possibility of inadvertently influencing weight-related attitudes in the control condition. Following the video, participants were given the previously administered IAT and questionnaires, again in a counter-balanced order. Finally, height and weight were measured, and participants were debriefed.

Measures

Controllability of weight and dislike of overweight individuals. Participants' belief in the controllability of weight and dislike of overweight individuals was measured with Quinn and Crocker's (18) modification of Crandall's Anti-Fat Attitudes Scale (AFA) (5). Controllability was assessed with the willpower subscale, which is comprised of eight items that assess the belief that obese individuals are in control of and are responsible for their weight (e.g., "Fat people can lose weight if they really want to"). Dislike was assessed with the Dislike subscale, which consists of 10 items measuring participants' level of dislike for overweight individuals (e.g., "Fat people make me feel somewhat uncomfortable"). Participants answered on a five-point scale ranging from "strongly disagree" to "strongly agree." Higher scores indicate a greater belief in the controllability of weight and greater dislike of overweight individuals, respectively. An administrative error occurred and one item was inadvertently omitted from the willpower subscale and the aforementioned five-point scale was used instead of the original 10-point scale. For this investigation, Cronbach's-α for the willpower and dislike subscales ranged from 0.81 to 0.89 (at time 1 and time 2).

Obese Person Trait Survey. The Obese Person Trait Survey (OPTS; ref. (19)) consists of 20 items listing stereotypical traits, including 10 negative (OPTS-negative; e.g., lazy, undisciplined, unattractive) and 10 positive stereotypes (OPTS-positive; e.g., honest, sociable, intelligent). Because *The Biggest Loser* presents individuals engaging in hard work and a variety of positive behaviors, we selected the OPTS which systematically assesses 10 positive and 10 negative stereotypical traits. Participants are asked to estimate the percentage (0–100%) of obese persons they believe possess each of these traits. Higher scores are indicative of endorsement of stronger negative and positive traits on the OPTS subscales, respectively. Both subscales of the OPTS have been found to have good internal reliability (19). For this study, coefficient α ranged from 0.85 to 0.91 for these scales at both time points.

Implicit bias. The Implicit Associations Test (IAT) is a widely used assessment of implicit attitudes typically associated with social prejudice (17). The IAT is based on the underlying principle that individuals classify stimuli faster when category pairs match implicit associations. Participants are expected to categorize stimuli faster when the category pairs match the way concepts are already related in their minds, such as with a biased attitude. Therefore, the IAT uses reaction time as an indirect measure of underlying automatic evaluations. The validity of the IAT as an indicator of implicit attitudes has been supported (20).

For the current study, an electronic version of the IAT was created and scored in accordance with the improved scoring algorithm described by Greenwald *et al.* (20). At the top of the computer screen, target category labels (i.e., fat people, thin people) and attribute category labels (i.e., good, bad) were paired. Participants were then instructed to classify

a list of words (subordinate stimuli: e.g., fat, slim, terrible, wonderful) into their appropriate category as quickly and accurately as possible by pushing designated keys on the keyboard. Before the weight-based IAT, participants completed a practice IAT (pairing flowers and insects with good and bad). On some trials, the target and attribute categories were paired in a way consistent with expected implicit negative associations with weight (matched conditions; e.g., fat people and bad), and on other trials, target and attribute pairings are reversed (mismatched conditions; e.g., fat people and good). These trials of matched and mismatched conditions were counter-balanced.

Weight change intentions. One question was included in the post-test questionnaire to assess participants' weight change intention ("Select the statement that best describes you: I am trying to stay the same weight; I am trying to lose weight; I am trying to gain weight; I am not concerned about my weight"). This variable was recoded as a dichotomous variable (0 = "trying to lose weight" and 1 = "not trying to lose weight") in the statistical analyses. The mean BMI for individuals trying to lose weight (mean = 28.5, s.d. = 4.06) was significantly higher (t (56) = 5.93, P = 0.00) than the mean BMI for individuals not trying to lose weight (mean = 22.9, s.d. = 3.09).

Body weight and height (BMI). Body weight was measured using a digital scale (BF-350e; Tanita, Arlington Heights, IL) to the nearest 0.1 lb and height was measured to the nearest 0.5 inch.

Statistical analyses

Baseline differences between groups were analyzed using one-way ANOVA and the Pearson's χ^2 test. Analysis of covariance was used to test hypotheses about the effect of viewing an episode of *The Biggest Loser* on explicit and implicit weight bias measures. Separate analyses of variance were conducted for each weight bias measure, and the comparable pretest score was included as a covariate. Main effects models were examined along with the two-way interaction between condition and pretest score. The results of the regression models are summarized using adjusted means or adjusted mean differences for main effects models and slopes for models with a two-way interaction. PASW Statistics 18 (Release 18.0.0; PASW, Chicago, IL) was used to analyze the data.

RESULTS

Demographic factors and weight bias

Fifty-nine of 64 participants completed both pre- and post-tests (control, n = 27; biggest loser, n = 32). There were no significant differences between the groups on demographic factors or pre-test scores (See **Tables 1** and **2**; P's > 0.20). Regarding correlations among the dependent variables, pretest levels of IAT scores did not correlate significantly with explicit measures of bias, suggesting that these measures and their constructs tap into different processes (r's ranging from 0.03 to 0.16, P >.22). The explicit measures of bias (OPTS negative and the AFA subscales) were significantly correlated to each other. For example, AFA dislike and OPTS-negative correlated at r = 0.31 (P = 0.017) and the relation between AFA willpower and OPTS-negative was r = 0.26 (P = 0.047). There were no significant correlations found between the AFA subscales and the OPTS-positive scale (P > 0.06).

Effect of condition on weight bias

In testing changes in controllability of weight, a significant interaction effect was found for AFA controllability pretest scores and condition (P = 0.003). Pretest scores accounted for 63% of the variability in post-test scores for the control group (B = 0.95, s.e. = 0.16) compared to 17% of the variance in post-test scores for *The Biggest Loser* condition (B = 0.34, s.e. = 0.11). In *The Biggest Loser* condition, individuals with lower initial perceptions of the controllability of weight had larger increases in their attitudes about the controllability of weight at post-test than individuals with higher initial perceptions of controllability (see **Figure 1**).

For the AFA dislike outcome, main effects are reported (the interaction between condition and pretest score was not statistically significant). Results of the main effects model showed that after adjusting for pretest dislike score, participants in *The Biggest Loser* condition (adjusted M = 2.04, s.e. = 0.06), on average, had significantly higher dislike scores on the post-test than those in the control condition (adjusted M = 1.84, s.e. = 0.07; P = 0.04).

For the OPTS outcomes, the effect of condition on OPTS-positive scores at the post-test was not statistically significant (adjusted M difference: 1.19, s.e. = 2.50; P = 0.64) and the interaction was not significant (P > 0.05). Similarly, there was no significant difference between the two conditions on OPTS-negative scores (adjusted M difference: 3.79, s.e. = 2.83; P = 0.19).

In assessing changes in implicit bias, no significant condition effect was found. Participants in *The Biggest Loser* condition did not significantly differ from participants in the control condition on levels of implicit bias on the post-test, after adjusting for pretest scores (adjusted M difference: 0.08, s.e. = 0.09; P = 0.38).

Post hoc analyses

In exploratory analyses, analysis of covariance was used to examine if weight-related factors (BMI and trying to lose weight) moderated the effect of condition on post-test dislike of overweight individuals and controllability of weight scores. The results showed a significant interaction effect of BMI and condition on post-test dislike scores (P = 0.04). Participants with lower BMIs had post-test dislike scores that were significantly higher after watching *The Biggest Loser* (B = −0.02,

Table 1 Demographic characteristics

	Control (n = 27)		Biggest loser (n = 32)		Total (n = 59)	
Characteristics	n	%	n	%	N	%
Female gender	18	66.7	21	65.7	39	66.1
White race	18	66.7	23	71.9	41	69.5
BMI categories						
Normal (<25)	14	51.9	15	46.9	29	48.3
Overweight (25–29)	6	22.2	11	34.4	17	28.3
Obese (≥30)	6	22.2	6	18.8	12	20.0
Trying to lose weight	12	44.4	18	56.3	30	50.8
	Mean	s.d.	Mean	s.d.	Mean	s.d.
Age	19.7	1.8	20.1	3.6	20.0	2.9
BMI	26.1	5.1	25.6	4.2	25.8	4.9

Table 2 Measures of weight bias by condition

	Control				Biggest loser			
	Pretest		Post-test		Pretest		Post-test	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
AFA dislike[a]	1.9	0.6	1.8	0.7	1.9	0.6	2.1	0.7
AFA controllability[a]	3.3	0.6	3.3	0.7	3.0	0.8	3.3	0.6
OPTS-positive[b]	57.2	11.4	56.9	11.9	57.1	17.9	58.0	14.8
OPTS-negative[b]	63.3	13.3	58.5	14.3	62.8	16.0	61.9	16.0
Implicit bias	0.46	0.30	0.33	0.37	0.49	0.45	0.43	0.45

AFA, anti-fat attitudes scale; OPTS, Obese Person Trait Scale.
[a]Higher scores indicate greater dislike of overweight individuals (dislike) or greater belief that weight is controllable (controllability). Scores range from 0 to 5.
[b]OPTS: higher scores indicating more positive or negative traits assigned to obese persons (range of scores: 0–100).

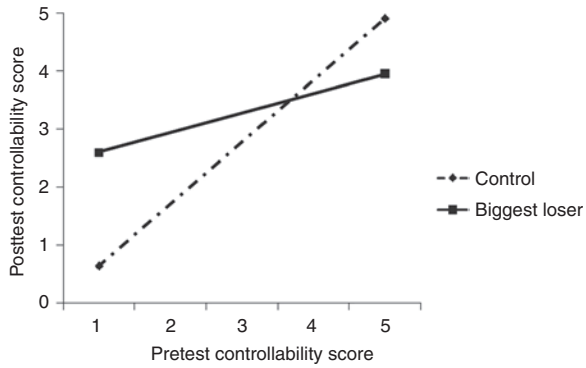

Figure 1 Pretest score moderates the effect of condition on attitudes about controllability of weight.

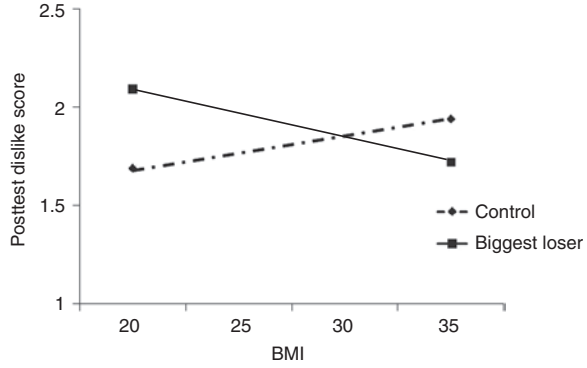

Figure 2 Interaction of BMI and condition on post-test anti-fat attitude dislike scores, controlling for pretest anti-fat attitude dislike scores.

s.e. = 0.01) compared to the control group ($B = 0.02$, s.e. = 0.01; see Figure 2). This suggests that the effect of condition was stronger for participants with lower BMIs.

Similarly, the interaction between trying to lose weight and condition was significant for the post-test dislike scores ($P = 0.04$). Post hoc pairwise comparisons showed that among participants who reported that they were not trying to lose weight, post-test dislike scores were significantly higher after watching *The Biggest Loser* compared to the control group (adjusted $M = 2.11$, s.e. = 0.09 vs. adjusted $M = 1.74$, s.e. = 0.09, $P = 0.005$). Adjusted mean AFA dislike scores on the post-test were similar for *The Biggest Loser* and control groups among participants who reported that they were trying to lose weight (adjusted $M = 1.98$, s.e. = 0.08 vs. adjusted $M = 1.99$, s.e. = 0.10, respectively). Thus, there was no effect of condition for participants who reported trying to lose weight. In contrast, trying to lose weight, as well as BMI, did not significantly moderate post-test controllability scores.

DISCUSSION

With millions of viewers each week, *The Biggest Loser* is an exceptionally popular reality television show. Nevertheless, heated debates have arisen over whether the program contributes to positive or negative attitudes toward obese individuals. In other words, does watching obese contestants engaging in grueling exercise and a restrictive eating regimen increase or decrease negative attitudes toward obese individuals? To our knowledge, no prior studies have experimentally examined this question. In short, watching 40 min of *The Biggest Loser* did not improve anti-fat attitudes, but rather, exacerbated them. After exposure to *The Biggest Loser*, participants reported significantly higher anti-fat attitudes; specifically, they reported greater belief that weight is controllable and greater dislike of obese individuals. Although contestants on *The Biggest Loser* shared their struggles with weight loss, this did not decrease participants' endorsement of the belief that weight is controllable as well as dislike of obese individuals. These findings are consistent with the contention by obesity researchers and obese individuals that *The Biggest Loser* inaccurately portrays weight loss and highlights individual responsibility for obesity (6,16).

In contrast to anti-fat attitudes, negative and positive traits prescribed to obese persons (OPTS) were not significantly changed after exposure to an episode of *The Biggest Loser*. We were surprised that OPTS-positive and negative scores were not significantly changed, given that the contestants on the episode engaged in a number of behaviors likely to counter stereotypes (e.g., persistence, hard work, and self-discipline). While the belief that obese individuals possess positive or negative

traits has been responsive to change in prior research modifying social consensus information (particularly from members of one's in-group; ref. (19)), *The Biggest Loser* episode used in the experimental condition did not communicate information regarding "others'" perceptions of the traits that obese individuals do or do not possess. In the absence of important social consensus information, it would appear that prevailing stereotypes were not modified, compared to the observed change in the perceived controllability of weight and the level of dislike of obese individuals.

Implicit anti-fat attitudes also did not change in response to the experimental manipulation, thus serving as a successful replication of prior research indicating that implicit attitudes are particularly difficult to change (21). Nevertheless, it may have been informative to use different category labels for implicit associations other than "good/bad." For example, it is not known if using a "motivated/lazy" IAT measure or an IAT more geared toward the reality show participants would have produced different results.

It is unclear why watching obese individuals engage in hard work and receive considerable success in losing weight could result in greater dislike towards obese individuals. Many have argued that the pervasive belief that weight is entirely under an individual's personal control is one of the primary attitudes perpetuating stigma and stereotypes of obese people (1). For instance, Allison, Basile, and Yuker found that people who believe obesity is largely within the person's control tend to have more negative attitudes toward obese persons than do individuals who believe obesity cannot be controlled by the person (22). It appears that people who hold these etiological beliefs infer that obese persons have not worked hard enough to reverse their condition, which is perceived to be highly controllable. It is plausible that seeing specific hardworking obese individuals lose weight successfully fuels negative attitudes toward obese people in general (e.g., "If they can do it, why don't all obese people?").

Exploratory analyses indicated stronger effects of *The Biggest Loser* for individuals who had lower BMI scores and among people who were not trying to lose weight. In fact, participants with higher BMIs or who were trying to lose weight in *The Biggest Loser* condition did not differ in dislike of obese individuals from similar participants in the control condition. Individuals who were thin or not trying to lose weight may have observed obese participants in *The Biggest Loser*, successfully losing weight and, as such, felt more negatively toward obese people in general. However, it is plausible that, as a consequence of internalized weight bias, individuals who are obese judged themselves more harshly for carrying excess weight, when they observed other obese individuals being successful at weight loss. Administration of an internalized weight bias scale, such as the Weight Bias Internalization Scale (23) may shed light on these relationships. Given the somewhat limited number of overweight individuals, these results warrant replication with a larger sample of individuals who are overweight or obese.

Despite the moderation of the condition effect by BMI and weight change intentions on dislike of overweight individuals, these variables did not moderate the condition effect on controllability of weight. Outrageous claims of the ease with which weight can be lost are ubiquitous in the media (1,24). Also, television news media most often focuses on personally controllable causes and solutions for obesity while mentioning less the uncontrollable social, biological, and environmental causes and solutions (25). Perhaps the pervasiveness of the belief that weight is controllable is so entrenched that people, regardless of weight category, endorse it. As such, it would appear that pre-existing BMI or weight change intentions has little influence on the belief that weight is highly controllable after viewing one episode of *The Biggest Loser*.

Limitations and implications

While the findings in the present study are provocative, conclusions are limited by the small, homogenous convenience sample in this investigation. Replication with a larger, more diverse sample is warranted. The majority of our participants were white and between the ages of 18- and 22-years-old. The impact of viewing *The Biggest Loser* on people of different race or ethnicity and age is unknown. Examining race and ethnicity is especially important given that levels in which persons stigmatize obese individuals have been found to differ by race and ethnicity (26). Future research should examine how the beliefs about controllability of weight serve as a mediating process between exposure to weight-loss reality shows and other forms of weight bias. Given its preliminary nature, the results in this study need replication before firm statements about causality can be made.

It would also be informative to use different forms of the IAT to detect condition effects on other associations with obese individuals, as well as alternative measures of explicit weight bias, such as the Anti-fat Attitudes Test (AFAT; ref. (27)) or the Fat Phobia Scale (28). Similarly, an examination of weight bias internalization (e.g., weight bias internalization scale; ref. (23)) would have been informative.

Future research may also be pursued in understanding the impact of watching the show on the self-esteem, mood, and body image of obese individuals, or the differential impact of reality television show programming of obesity vs. other prime time fictitious portrayals of obese individuals.

This investigation takes a needed first step in examining how weight-loss reality shows affect weight bias and has implications for interventions to reduce weight bias. This investigation suggests that even television shows in which overt bias towards obese individuals is not portrayed may inadvertently increase dislike of these individuals and fuel perceptions that weight is highly controllable. Viewing this form of entertainment would appear to come at a cost to people who are obese by fueling weight stigma in general. Given the popularity of this show, these effects could have a considerable impact on the millions of its viewers.

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DISCLOSURE

The authors declared no conflict of interest.

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