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“Weak, Sad, and Lazy Fatties”: Adolescents’ Explicit and Implicit Weight Bias Following Exposure to Weight Loss Reality TV Shows

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ABSTRACT

Weight loss reality TV shows, which portray obese individuals and their struggle to lose weight, are highly popular. However, the shows often contain negative and stereotypical portrayals of obese individuals that can contribute to the formation of weight bias among viewers. In particular, adolescents might be highly susceptible to such portrayals, since physical appearance and body image play an important role during adolescence. In our experimental study, we investigated the priming effects of exposure to weight loss reality TV shows on implicit and explicit attitudes toward obese individuals among 353 adolescents. We exposed a treatment group ($n = 173$) to video clips of a weight loss reality TV show and a control group ($n = 180$) to video clips of an information-based TV magazine. Results indicated that for individuals who expressed a fear of being obese, exposure to the weight loss reality TV show reinforced negative explicit attitudes toward obese individuals by activating a perception of weight controllability. Exposure to the weight loss reality TV show also enhanced negative implicit attitudes toward obese individuals among all adolescents, irrespective of their fear of being obese. Altogether, our findings underscore the role of media in perpetuating weight bias.

Western societies highly stigmatize obesity. Overweight or obese individuals of all ages face multiple forms of discrimination in different situations of daily life, including in health, employment, and educational settings. In perpetuating the stigmatization of obesity, or weight bias, media play an important role. On the one hand, results of content analytical research have provided evidence that various media genres demonstrate weight bias (Ata & Thompson, 2010). In particular, by emphasizing the lack of willpower, isolation, and laziness of obese individuals, reality TV shows depicting weight loss (e.g., *The Biggest Loser*, *Secret Eaters*, *Extreme Weight Loss*) promote the stigmatization and degradation of obese individuals (Sender & Sullivan, 2008). On the other hand, research on media priming has shown that stereotypical portrayals enhance stereotypical

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beliefs and can influence judgments about the stereotyped group. Findings of several empirical studies have demonstrated that exposure to stereotypical portrayals of obesity prompt increased weight bias, including negative attitudes and behavior toward obese individuals (e.g., Hinman, Burmeister, Kiefner, Borushok, & Carels, 2015; Puhl, Luedicke, & Heuer, 2013).

Given the potential negative outcomes of stereotypical portrayals, it seems crucial to further investigate the media priming effects of weight loss reality TV shows on explicit and implicit weight bias. In particular, shows featuring overweight teen contestants (e.g., *The Biggest Loser Teens*, *I Used To Be Fat*) might negatively affect adolescents. Due to physical changes that emerge during puberty, body image and personal appearance become priorities among adolescents (e.g., Ricciardelli & Yager, 2016). Accordingly, weight loss reality TV shows address highly relevant topics among adolescents—namely, body image and body weight—who thus constitute an age group whose perception of obesity and overweight in media merits further investigation. Moreover, in this period of life, social relationships with peers are deemed as highly relevant (Puhl & Latner, 2007). Against this background, weight bias is considered as particularly problematic, because overweight adolescents are more likely to be socially marginalized by their peers than nonobese adolescents (Greenleaf, Chambliss, Rhea, Martin, & Morrow, 2006; Kjelgaard, Holstein, Due, Brixval, & Rasmussen, 2017; Strauss & Pollack, 2003).

Our study contributes to the literature on media priming and weight bias in several ways. For one, the study extends research on media priming and stereotyping by investigating body-related stereotypes. So far, most research on media priming and stereotyping dealt with gender stereotypes or racial stereotypes (Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2009). Second, it is the first study to investigate media priming effects of exposure to weight loss reality TV shows on weight bias among adolescents. Thus far, studies on the effects of stereotypical portrayals of obesity have used student samples (e.g., Domoff et al., 2012; Hinman et al., 2015; Yoo, 2013). Our contribution is important, because researchers consider the negative consequences of weight bias (e.g., social marginalization) as particularly problematic for adolescents (Puhl & Latner, 2007). Third, negative media portrayals may not only have an impact on overtly expressed judgments (explicit attitudes) but may also influence subtle automatic *gut reactions* toward obese individuals (implicit attitudes). Given evidence that negative implicit attitudes can predict spontaneous reactions and social behavior (Bessenoff & Sherman, 2000), taking into account implicit attitudes toward obese individuals seems indispensable. Thus, along with an explicit measure of weight bias, we included an implicit measure as well, which marks a novel implicit measurement procedure—the affective misattribution procedure (AMP)—in research on the topic (Payne, Cheng, Govorun, & Stewart, 2005). Last, despite the relevance of the topic, moderators and mediators of media exposure and obesity stigmatization remain nearly unexplored in the literature.

Nevertheless, the results of Domoff et al. (2012) and Yoo (2013) suggest that attitudes toward obese individuals relate to a belief that obesity is under personal control and being thin is merely a question of willpower. Accordingly, we tested weight controllability as a mediator, as well as whether the predisposition of *overweight preoccupation* (Crandall, 1994) moderates the media priming effect on weight bias.

Stereotypical portrayals of obese individuals

Findings from content analyses of portrayals of overweight and obese individuals in mass media have revealed a pervasive weight bias in a range of entertainment and news media (for review, see Ata & Thompson, 2010). More germane to our study, other findings have shown that stigmatizing portrayals of obese individuals are ubiquitous in media popular among adolescents, including TV programs (Eisenberg, Carlson-McGuire, Gollust, & Neumark-Sztainer, 2015), YouTube videos (Hussin, Frazier, & Thompson, 2011), and social networking sites (Chou, Prestin, & Kunath, 2014). Although media commonly underrepresent obese individuals, media are also more likely to stigmatize and deride them (Ata & Thompson, 2010).

In particular, reality TV shows focusing on weight loss, such as *The Biggest Loser*, have faced criticism for reinforcing the stigmatization of obese individuals by portraying them in stereotypical ways. *The Biggest Loser* spotlights the association of obesity, laziness, and the need to develop willpower, all while claiming authenticity via its reality TV format (Monson, Donaghue, & Gill, 2016; Sender & Sullivan, 2008). The TV show suggests that “Anybody can be thin. And everybody should want to be thin. There is one method of weight loss that works for anyone and if you cannot lose weight it is because you are not working hard enough” (Monson et al., 2016, p. 538). Furthermore, the show strongly implies that a person’s worth stems from his or her weight and that weight loss is the only solution to all problems (Monson et al., 2016). In short, *The Biggest Loser* and other weight loss reality TV shows fuel the common belief that weight is truly controllable.

Priming stereotypical portrayals of obese individuals

Findings of previous research have suggested that the ways in which media portray obesity have important implications for the explicit and implicit weight bias among audiences (e.g., Gapinski, Schwartz, & Brownell, 2006; Hinman et al., 2015; McClure, Puhl, & Heuer, 2011). Media priming provides a theoretical explanation for this process (Roskos-Ewoldsen et al., 2009). Exposure to a media prime can temporarily activate particular concepts in line with the media content (e.g., stereotypes about obese individuals) and prompt the spreading activation of related concepts (e.g., negative attitudes toward obese individuals).

After the prime's establishment, activated concepts are both more accessible and more likely applied in subsequent situations (Roskos-Ewoldsen et al., 2009). Against that theoretical background, researchers have shown that priming individuals with stereotypical media content prompts increased explicit and implicit stereotypes (e.g., Abraham & Appiah, 2006; Arendt, 2013; Matthes & Schmuck, 2017) or increased explicit or implicit negative attitudes (e.g., Valentino, 1999) toward various social groups.

In the following sections, we review previous findings about exposure to stereotypical portrayals of obesity on individuals' explicit and implicit weight bias. In line with other researchers (e.g., Carels et al., 2013; Hinman et al., 2015; O'Brien, Hunter, Halberstadt, & Anderson, 2007), we define explicit negative attitudes toward obese individuals and weight controllability as manifestations of *explicit weight bias*, as well as implicit negative attitudes toward obese individuals as manifestations of *implicit weight bias*. Based on recent literature (e.g., Domoff et al., 2012; Hinman et al., 2015), we argue that stereotypical portrayals of obese individuals affect media viewers in two ways. On the one hand, we hypothesized an indirect effect on explicit negative attitudes toward obese individuals, which is mediated through weight controllability. More specifically, in line with the media priming approach, we expected that stereotypical media portrayals of obesity activate the concept that weight is controllable in individuals' minds, which prompts the spreading activation of the related concept, negative attitudes toward obese individuals. On the other, we anticipated a priming effect on implicit negative attitudes toward obese individuals based on automatic associations.

Explicit weight bias: Weight controllability and negative attitudes

Most research examining the consequences of exposure to negative stereotypical portrayals of obese individuals on attitudinal responses has relied on using images or photographs as media stimuli. The results of such studies have indicated that exposure to portrayals in association with behaviors congruent with common stereotypes (e.g., sedentariness, eating unhealthy food, watching TV) generate increased explicit negative attitudes toward obese individuals (Gapinski et al., 2006; Hinman et al., 2015; McClure et al., 2011; Puhl et al., 2013).

Among the few researchers to have tested the effects of weight loss reality TV shows on explicit weight bias, Domoff et al. (2012) exposed 64 university students to an episode of either *The Biggest Loser* or a nature reality TV show, and found that exposure to *The Biggest Loser* reinforced perceptions among viewers that obesity is a matter of personal responsibility. Furthermore, they also observed that watching obese individuals engage in hard exercise and successfully lose weight could promote unfavorable attitudes among viewers toward obese people in general (Domoff et al., 2012).

In several empirical studies, researchers have highlighted that perceptions of weight as being truly controllable relate to the dislike of obese individuals (e.g., Anesbury & Tiggemann, 2000; Crandall, 1994; O'Brien et al., 2007). The stereotypical attribution of weight controllability is particularly problematic, because it can fuel the dislike and stigmatization of obese individuals, as attribution theory explains (Weiner, Perry, & Magnusson, 1988). According to that theory, stigmata considered to be self-inflicted (e.g., obesity, drug addiction) evoke less pity, but more anger and dislike than stigmata considered to be noncontrollable such as blindness or cancer (Weiner et al., 1988).

So far, however, only Yoo (2013) has examined the relationship of media use, weight controllability, and attitudes toward obese individuals. Though not following an experimental approach, Yoo (2013) investigated antecedents and effects of exposure to *The Biggest Loser* in a survey among 684 undergraduate students and found that the show reinforced the perception that obesity is under personal control and that such perception, in turn, fostered negative attitudes toward obese individuals. Based on the mentioned theoretical considerations and empirical results, we hypothesized that priming participants with weight loss reality TV shows activates negative attitudes about obese individuals and that weight controllability mediates that effect, since the core message of such shows is that weight is controllable and a question of willpower (Monson et al., 2016). More formally, we proposed that

H1: Exposure to weight loss reality TV shows enhances the belief among adolescents that weight is controllable, which prompts more negative attitudes toward obese people.

The moderating role of overweight preoccupation

In earlier studies, researchers indicated that nonmedia-related factors can foster negative attitudes toward obesity (e.g., O'Brien et al., 2007; Swami, Pietschnig, Stieger, Tovée, & Voracek, 2010). Those factors can also play an important role in individuals' susceptibility to negative, stereotypical portrayals of obesity in media. Specifically, a person's fear of becoming fat (Swami et al., 2010) can moderate attitudinal outcomes in response to media exposure to the stigmatization of obesity. Overweight preoccupation refers to the concern to gain a substantial amount of weight (Crandall, 1994). Accordingly, a person who expresses fear of gaining weight or becoming overweight might be more susceptible to stereotypical portrayals in weight loss reality TV shows than someone who does not. Their heightened susceptibility might be explained by their greater involvement, for their fear of overweight allows negative portrayals of obese individuals to resonate more sharply with them. In line with dual process models of persuasion, including Petty and Cacioppo's (1986) the elaboration-likelihood model (ELM), individuals with greater overweight preoccupation, and therefore higher involved individuals,

might process media's messages more thoroughly and thus be more affected by them. Those same individuals are consequently more likely to be persuaded by the core message of weight loss reality TV shows—namely, that weight is controllable. Accordingly, we argue that pre-existing overweight preoccupation heightens the priming effect of weight loss reality TV shows in terms of perceived negative attitudes toward obese individuals via the perception of weight controllability. Based on that reasoning, we formulated a second hypothesis:

H2: The effect of exposure to weight loss reality TV shows on more negative attitudes toward obese people via weight controllability is stronger for individuals with higher levels of overweight preoccupation.

Implicit weight bias: Implicit attitudes

Although research has enhanced current understandings of weight loss reality TV shows' potential priming effects on explicit self-reported attitudes, it has insufficiently accounted for the influence on adolescents' automatic reactions toward obese individuals—that is, their implicit attitudes. Numerous researchers have indicated that attitudes toward obese individuals can emerge aside from individuals' conscious awareness or intention (e.g., Bissell & Hays, 2010; Gapinski et al., 2006; O'Brien et al., 2007). Those implicit attitudes stem from automatic associations of two or more concepts—for instance, e.g., obesity and laziness; (Greenwald, McGhee, & Schwartz, 1998)—and can predict stronger appearance-based evaluations of others (Carels et al., 2013), as well as prejudiced behaviors toward overweight individuals (Bessenoff & Sherman, 2000).

To date, however, only one group of researchers has investigated the effect of weight loss reality TV shows on implicit negative attitudes toward obese individuals. Using the implicit association test (IAT), Domoff et al. (2012) found no significant effects on implicit negative attitudes. However, other researchers have revealed the negative effects of unfavorable visual media portrayals of obesity on implicit attitudes. For instance, Hinman et al. (2015) showed that images of behavior congruent with stereotypes (e.g., obese individuals watching TV or eating junk food) generated greater implicit weight bias than images of behavior incongruent with stereotypes (e.g., obese individuals exercising or eating vegetables). Interestingly, Carels et al. (2013) found similar results among a sample of overweight and obese participants upon showing them similarly congruent and incongruent images. Based on those findings and drawing on priming theory (Roskos-Ewoldsen et al., 2009), we expect exposure to a weight loss reality TV show to directly affect implicit negative attitudes toward obese individuals:

H3: Exposure to weight loss reality TV shows increases negative implicit attitudes toward obese people.

Interplay of implicit and explicit weight bias

Last, we also explored the relationship of implicit and explicit weight bias. Although some scholars argue that explicit attitudes are based on implicit attitudes (Gawronski & Bodenhausen, 2006), Hofmann, Gawronski, Gschwendner, Le, and Schmitt's (2005) meta-analysis of implicit–explicit correspondence showed that those correlations are typically quite low ($r = .17$). Nevertheless, it remains possible that negative implicit attitudes partially mediate the effects of negative portrayals of obese individuals on explicit attitudes. In the past, researchers have reported mixed results on the relationship between implicit and explicit weight bias. Whereas Bissell and Hays (2010) found that implicit weight bias measured with the IAT predicted increased explicit weight bias among 7- to 13-year-old children, Vartanian, Herman, and Polivy (2005) found no significant correlation between implicit and explicit antifat attitudes among female undergraduates. Though not central to our analysis, we additionally examined the relationship between implicit and explicit attitudes by asking

RQ1: Is there an effect of implicit attitudes on explicit attitudes?

Method

Participants

We conducted an online survey experiment with 353 adolescents, aged 16–19 years, whom we randomly assigned to a treatment group ($n = 173$) or control group ($n = 180$). We recruited 354 adolescents via a data collection company. Due to an invalid survey completion time, we had to exclude one adolescent, which yielded a final sample of 353 participants. We employed quota sampling based on the demographic characteristics of the general population in Germany for age ($M = 17.34$, $SD = 1.09$), gender (49.6% women), and level of current or completed education (3.4% without school degree, 6% compulsory school degree, 21.8% vocational school, 21.8% upper-intermediate leaving certificate, 8.2% comprehensive school, 35.1% general university qualification, 3.7% another form of school).

Experimental procedure

After giving their informed consent to participate, participants completed a questionnaire involving the hypothesized moderator of overweight preoccupation. Items appeared in a questionnaire block with other unrelated measures (e.g., questions about lifestyle and fashion) to conceal the study's intention. Next, we exposed participants to the stimulus material by presenting video clips on an otherwise blank screen in consecutive order. We instructed participants to watch the videos carefully and forced their exposure time (i.e., we prevented them from

fast-forwarding through the clips by repressing the toolbar of the video player). Subsequently, participants completed the implicit measurement procedure and an online questionnaire involving the mediator, dependent variables, and control variables. Lastly, we thanked and debriefed participants.

Stimulus material

In the treatment group, we exposed participants to three 2-min video clips of the reality TV show *The Biggest Loser Teens*, which replicates the original show *The Biggest Loser* except with 16- to 19-year-old contestants, instead of adults. Based on extensive analysis of the show's content, we created the video clips to contain negative stereotypical portrayals of obese individuals and narrative aspects typical of weight loss reality TV shows: reasons for the contestant's overweight, his or her struggle with weight loss, his or her involvement in vigorous exercise activities, and the benefits of weight loss such as improved self-esteem (Monson et al., 2016; Peltier & Mizock, 2012). Each clip featured a female and a male adolescent contestant, who received equal airtime in the clip. The first clip introduced the two contestants by providing background information about their family and history with overweight. Both contestants attributed their overweight to laziness and uncontrolled eating. The second clip depicted the two contestants exercising vigorously and contained scenes of the contestants in negative emotional states (e.g., crying, whining). Last, the third clip depicted the contestants' success with losing weight. They described the benefits of weight loss with reference to increased self-esteem and their newly acquired opportunity to fulfill their dreams (i.e., becoming a singer or a dancer). Because both contestants achieved their goals and lost a significant amount of weight, the third clip ultimately conveyed the core message of weight loss reality TV shows: that anybody can become thin if they simply work hard enough (Monson et al., 2016).

In the control group, we exposed participants to three 2-min video clips of the TV magazine *Galileo*. *Galileo* is a well-known TV show with topics evolving around popular science. The control group saw video clips that explained and tested different learning techniques (i.e., learning while listening to music) used by several groups of men and women. The structure of the clips was similar to that of clips watched in the treatment group; however, clips in the control group contained many female and male contestants of varying age, weight, and attractiveness to prevent contrast effects. All stimulus materials are available from the authors upon request.

To check whether the participants paid attention to the video stimuli, we asked participants in the treatment group seven dichotomous (*yes, no*) questions regarding the content of the videos (e.g., "The boy Daniel was shown together with his brother"). Afterwards, we calculated a summative index for all seven questions. On average, participants gave 6.06 ($SD = 1.22$, *range*: 2–7) correct answers, which we considered as acceptable attention toward the stimulus.

Pretest of stimulus material

We conducted a pretest of the stimulus material among a student sample ($N = 39$, 68% female, $M_{age} = 25.03$, $SD = 8.18$), whom we randomly assigned to watch the treatment group videos ($n = 25$) or control group videos ($n = 14$). Results indicated that the treatment group and control group videos did not significantly differ in their perceived professionalism (treatment: $M = 4.60$, $SD = 2.13$; control: $M = 3.62$, $SD = 2.08$; $F(1,37) = 1.99$, $p = .167$, $\eta^2 = .05$) or perceived entertainment value (treatment: $M = 4.80$, $SD = 1.90$; control: $M = 3.75$, $SD = 1.65$; $F(1,37) = 1.34$, $p = .076$, $\eta^2 = .08$). We also presented pretest participants with several statements describing the content of the treatment group videos, and participants indicated their agreement to each statement on a 7-point scale.

We asked pretest participants to indicate whether the first video clip (i.e., about contestants' weight history) attributed obesity to internal or external causes. Three items assessed internal attributions of weight (e.g., "The video suggests that obese people's overweight is their personal responsibility"), whereas two items assessed external attributions (e.g., "The video suggests that external circumstances are responsible for individuals' overweight"). Participants indicated that internal attributions of weight ($M = 4.82$, $SD = 1.67$) were significantly greater in the clip than external ones ($M = 1.22$, $SD = 0.65$), $F(1,24) = 162.60$, $p < .001$, $\eta^2 = .82$. We also asked participants to indicate the degree to which the second video clip (i.e., showing contestants exercising vigorously) portrayed individuals as being weak using three items (e.g., "The video aims to show that obese individuals are whiny"). Another item gauged whether the clip portrayed individuals as self-confident ("The video suggests that obese individuals are self-confident"). Results indicated that participants thought obese individuals were more likely to be considered weak ($M = 4.21$, $SD = 1.72$) than self-confident ($M = 1.60$, $SD = 0.96$; $F(1,24) = 49.08$, $p < .001$, $\eta^2 = .67$). Last, we asked participants whether the third video clip (i.e., about successful weight loss) suggested that weight is important for the personal achievement of goals using four items (e.g., "The video shows you can only fulfill your dreams when you are skinny" vs. "The video suggests that one's weight does not play a role in the achievement of one's goals"). Findings indicated that the clip suggested that weight plays an important role in the achievement of personal goals ($M = 4.68$, $SD = 1.88$, versus $M = 2.66$, $SD = 1.51$; $F(1,24) = 12.20$, $p = .002$; $\eta^2 = .34$).

Measures

Explicit negative attitudes

We assessed explicit negative attitudes toward obese individuals with eight self-developed items based on Crandall's (1994) Dislike subscale (Cronbach's $\alpha = .92$, $M = 2.12$, $SD = 0.09$). We measured explicit negative attitudes and

all other items on a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*; see [Appendix](#)).

Weight controllability

We assessed weight controllability with eight items based on Quinn and Crocker's (1999) study (Cronbach's $\alpha = .81$, $M = 3.43$, $SD = 0.74$).

Overweight preoccupation

We gauged overweight preoccupation with three items based on Crandall's (1994) *fear of fat* subscale (Cronbach's $\alpha = .81$, $M = 3.11$, $SD = 1.15$).

Implicit negative attitudes

We assessed implicit negative attitudes toward obese individuals with the AMP (Payne et al., 2005), an indirect measure that does not directly ask participants to report their attitudes, but uses misattributions that people make about their own affective reactions to measure attitudes implicitly. Additionally, it measures influences of attitudes on behavior that persist though participants might oppose them. Meta-analytic evidence provided by Payne and Lundberg (2014) suggests that the AMP has strong predictive validity and strong reliability that is comparable to or even higher than that of any other implicit measure. The procedure that we used was based on Payne et al.'s (2005); we informed participants that the study examined "how people make simple but quick judgments" (p. 280), that they would see several pairs of images, each pair consisting of a silhouette and a Chinese character, and that the first image was simply a warning signal for the character. We asked participants to judge the visual pleasantness of each Chinese character as quickly as possible and to not let their appraisal of the first image influence their judgment of the character. We told participants to click a button labeled *unpleasant* if they judged the character to be less visually pleasing than average and a button labeled *pleasant* if they judged it to be more visually pleasing than average.

In total, participants saw 12 silhouette images (see Appendix for examples) of obese individuals (six women, six men) and 12 silhouette images of nonobese individuals (six women, six men), each of which appeared prior to a Chinese character (cf. Parrott, 2015). They also saw 12 Chinese characters not accompanied by a silhouette to generate a baseline measure. We obtained the Chinese pictographs from Payne's personal web site where he provides research material (Payne, 2016). The silhouettes were researched online and downloaded from the Internet. We calculated the AMP score by subtracting the proportion of pleasant responses during obese prime trials from the proportion of pleasant responses during nonobese prime trials. We ultimately excluded nine participants from the AMP who indicated that they read Chinese and two others who encountered technical problems during the procedure.

Liking of weight loss reality TV shows

As a control variable, we assessed the degree to which participants liked weight loss reality TV shows in general using one 5-point semantic differential-scaled item ($M = 2.68$, $SD = 1.32$). Participants could also indicate that they had no knowledge of any weight loss reality TV shows ($n = 38$; 10.8%).

Randomization check

A randomization check revealed no significant effects for gender, $\chi^2(1, N = 353) = 0.07$, $p = .793$; age, $F(1,351) = 0.27$, $p = .607$; education, $\chi^2(6, N = 353) = 6.15$, $p = .406$; self-reported body mass index, $F(1,342) = 0.28$, $p = .599$; or liking of weight loss reality TV shows, $F(1,351) = 1.12$, $p = .291$, which indicated that randomization was successful.

Data analysis

To test our hypotheses, we conducted a path analysis based on full information maximum likelihood estimation using the *lavaan* package in *R* (Rosseel, 2012). We entered the interaction term of experimental group and overweight preoccupation to investigate the moderating effect of overweight preoccupation on the effect of exposure to the reality TV show on weight controllability. We mean-centered overweight preoccupation prior to computing the interaction term and modeled weight controllability as a mediator of the TV show's effects on negative explicit attitudes toward obese individuals. We used 95% bias-corrected bootstrap confidence intervals based on 1,000 bootstrap samples for statistical inference of indirect effects and controlled for weight loss reality TV show liking in all analyses. Figure 1 shows the model of hypothesized effects.

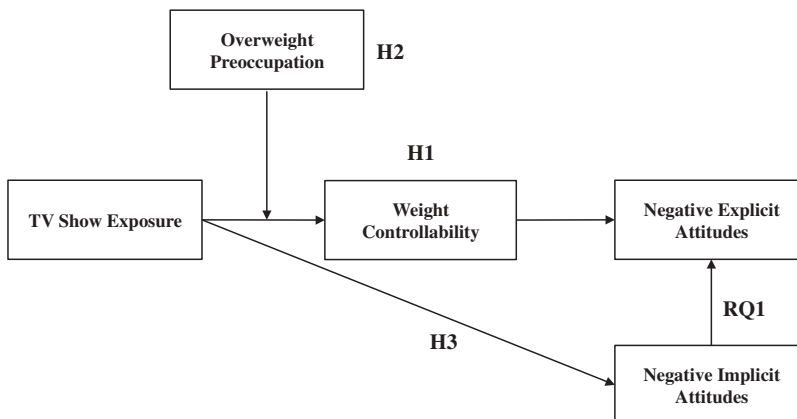


Figure 1. Conceptual moderated mediation model.

Note. Control variables, measurements errors, and correlations between all exogenous variables were omitted from depiction for clarity reasons.

Results

Table 1 displays the zero-order correlations between the core variables of the study and Table 2 presents our results of the path analysis. Our first hypothesis (H1) assumed that exposure to the weight loss reality TV show would enhance perceived weight controllability, which would result in more negative explicit attitudes toward obese individuals. Our results did not confirm that hypothesis. Exposure to the weight loss reality TV show exerted no significant effect on perceived weight controllability ($b = 0.11$, $SE = 0.08$, $p = .188$). We detected a positive and significant effect of weight controllability on negative explicit attitudes toward obese individuals ($b = 0.49$, $SE = 0.08$, $p < .001$); however, results revealed that exposure to the reality TV show had no indirect effect on explicit attitudes via perceived weight controllability ($b = 0.05$, $SE = 0.04$, $p = \text{n.s.}$; confidence interval [CI] = $[-.02, .15]$). Accordingly, we rejected H1.

In our second hypothesis (H2), we assumed that the effect of exposure to the weight loss reality TV show on negative explicit attitudes via weight controllability would be stronger for individuals with greater overweight preoccupations. In line with that assumption, we detected a significant interaction effect of exposure to the weight loss reality TV show and overweight preoccupations on perceived weight controllability ($b = 0.17$, $SE = 0.07$, $p = .012$). Additionally, we computed a moderated mediation analysis using 1,000 bootstrapping samples and 95% bias-corrected confidence interval (Hayes, 2015). Our findings revealed a significant interaction effect of exposure to the weight loss reality TV show and

Table 1. Zero-order-correlations.

	1	2	3	4	5
1. Overweight preoccupation	1				
2. Weight loss TV show liking	.08	1			
3. Weight controllability	.05	.16**	1		
4. Negative explicit attitudes	.06	.09	.39**	1	
5. Negative implicit attitudes	-.02	.01	.17**	.04	1

Note. ** $p < .01$

Table 2. Path analysis based on full information maximum-likelihood-estimation, $N = 353$.

Variables	Weight controllability			Negative explicit attitudes			Negative implicit attitudes		
	<i>b</i>	SE	β	<i>b</i>	SE	β	<i>b</i>	SE	β
Weight loss TV show exposure	0.11	0.08	.07	0.09	0.10	.05	0.10	0.04	.12*
Overweight preoccupation	-0.06	0.05	-.10	0.05	0.05	.06	0.00	0.03	.00
Weight loss TV show exposure*overweight preoccupation	0.17	0.07	.19*	-0.03	0.08	-.03	-0.02	0.04	-.04
Weight loss TV show liking	0.07	0.04	.13*	0.00	0.04	.01	0.00	0.02	.00
Weight controllability				0.49	0.08	.39***	0.14	0.03	.26***
Negative implicit attitudes				-0.05	0.13	-.02			
Adj. R^2		.05			.16			.08	

Note. *** $p < .001$; * $p < .05$; Model Fit Indices ($\chi^2 (21) = 367.16$, CFI = 1.00, TLI = 1.00, RMSEA = .00 90%-CI [.00, .00]).

overweight preoccupations on explicit attitudes, mediated by weight controllability for individuals with high overweight preoccupations (1 *SD* above the mean; conditional indirect effect of exposure: $b = 0.17$, $SE = 0.06$; $p < .05$; $[CI] = [.05, .31]$). The indirect effects of TV show exposure on negative explicit attitudes toward obese individuals for individuals with low (1 *SD* below the mean; $b = -0.03$, $SE = 0.05$, $p = \text{n.s.}$; $[CI] = [-.13, .08]$) and moderate (mean; $b = 0.07$, $SE = 0.04$, $p = \text{n.s.}$; $[CI] = [-.00, .15]$) overweight preoccupation were not significant. That is, weight loss reality TV exposure shaped explicit negative attitudes toward obese individuals by enhancing perceived weight controllability; however, that effect occurred only for adolescents with high overweight preoccupations. Therefore, for individuals who expressed fear and disgust of being obese, the weight loss reality TV show reinforced their negative explicit attitudes toward people with obesity by activating the perception of weight controllability. The weight loss reality TV show did not affect explicit attitudes of individuals with moderate or low overweight preoccupations. In technical terms, we thus detected a moderated mediation mechanism. We also ran the analysis with self-reported body mass index as moderator and found no significant effects, indicating that subjective rather than objective body perceptions moderated the effects of TV show exposure on negative attitudes toward obese individuals.

Next, we tested whether exposure to the weight loss reality TV show enhanced negative implicit attitudes toward obese individuals (H3), for which we found support. Exposure to the weight loss reality TV show induced more negative implicit attitudes toward obese individuals ($b = 0.10$, $SE = 0.04$, $p = .030$). Participants in the treatment group achieved a significantly higher difference score between pleasant responses during obese prime trials and pleasant responses during nonobese prime trials than that of participants in the control group, which indicates that the treatment group rated obese prime trials as being significantly more unpleasant (Figure 2). We also observed a positive and significant effect of perceived weight controllability on negative implicit attitudes toward obese individuals ($b = 0.14$, $SE = 0.03$, $p < .001$). As for explicit attitudes, moderated mediation analysis confirmed an indirect effect of TV show exposure on implicit attitudes via weight controllability for participants with high overweight preoccupations ($b = 0.05$, $SE = 0.02$; $p < .05$; $[CI] = [.01, .09]$). Hence, participants with higher weight preoccupations reacted with not only more negative explicit attitudes, but also more negative implicit attitudes toward obese individuals in response to exposure to the weight loss reality TV show. However, we also found a significant direct effect of TV show exposure on implicit attitudes for all participants irrespective of their overweight preoccupations that weight controllability could not explain.

Finally, in response to our research question (RQ1), we found no effect of implicit attitudes on explicit attitudes toward obese individuals ($b = -0.05$, $SE = 0.12$, $p = .694$). Overall, we could explain 16% of the variance of negative

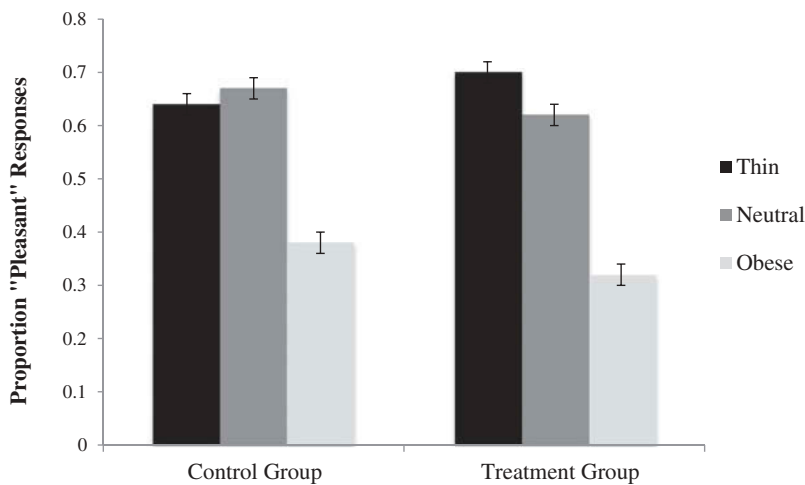


Figure 2. Proportion of “pleasant” responses as a function of prime trials and experimental condition. Error bars represent one standard error.

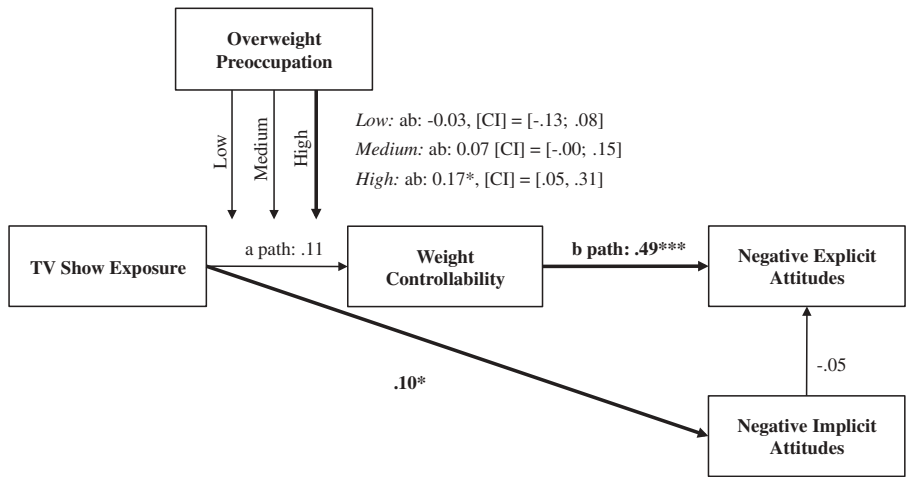


Figure 3. Hypothesized unstandardized path coefficients.
Note. Control variables, measurement errors, and correlations between all exogenous variables were omitted from depiction for clarity reasons. The indicated effect of overweight preoccupation refers to the moderated mediation mechanism. $^{***} p < .001$; $^* p < .05$

explicit attitudes toward obese individuals (Table 1). For the control variable of liking the TV show, we found a positive and significant effect on weight controllability ($b = 0.07$, $SE = 0.03$, $p = .030$). Figure 3 presents the unstandardized coefficients of our model.

We found no significant effects between the control and treatment groups when we used the difference score between the obese prime trials and baseline (i.e., no prime) as a dependent variable. Additionally, participants did not significantly differ in their evaluation of the Chinese characters without a prime (i.e., baseline) in the control and treatment groups.

Discussion

Overweight and obese individuals face discrimination in many settings of their daily lives. By extension, media—in particular, weight loss reality TV shows—present obese individuals in stereotypical ways (Ata & Thompson, 2010): as lazy, whiny, and with poor willpower (Sender & Sullivan, 2008). Those shows also underscore the notion that weight is under personal control and a matter of personal responsibility (Monson et al., 2016). However, researchers have largely neglected the media priming effects of weight loss reality TV shows on attitudes toward obese individuals despite the shows' immense popularity. So far, only one experimental study by Domoff et al. (2012) has investigated the effects of exposure to *The Biggest Loser* on attitudes toward obese individuals among university students. Their findings indicated that exposure to the show can heavily contribute to individuals' explicit weight bias, although they detected no effect on implicit weight bias. At the same time, researchers have widely neglected an audience segment that could be particularly vulnerable to stigmatizing portrayals of obese individuals: adolescents. Against the background of recent TV shows and TV show formats that focus specifically on weight loss among adolescents (e.g., *The Biggest Loser Teens*, *I Used to Be Fat*), investigating the media priming effects of weight loss reality TV shows on adolescents' explicit and implicit weight bias is important.

Overall, our findings demonstrate that weight loss reality TV shows can increase negative explicit attitudes toward obese individuals by activating the perception of weight controllability among adolescents. Weight loss reality TV shows reinforced the perception that weight is controllable and a matter of personal responsibility, which resulted in unfavorable attitudes toward obese people in general. However, that effect was present only among adolescents who expressed fear of becoming overweight. In other words, overweight preoccupations moderated the effects of exposure to the weight loss reality TV show on perceptions of weight controllability, which suggests that pre-existing attitudes or predispositions play a critical role in media effects in the context of weight bias. Dual process models such as the ELM (Petty & Cacioppo, 1986) provide a theoretical explanation for that effect; individuals who worry about their weight show a higher personal involvement in weight-related issues and are thus more likely to thoroughly process the core message of weight loss reality TV shows—namely, that weight is a matter of personal responsibility.

Interestingly, we also found an indirect effect of exposure to the weight loss reality TV show on implicit attitudes via the notion of weight controllability among individuals with high overweight preoccupations. Hence, the belief that weight is a matter of personal responsibility not only increased negative explicit attitudes toward obese individuals, but also simultaneously fostered an

independent automatic formation of negative associations with overweight individuals. However, both processes occurred only for individuals with high overweight preoccupations, perhaps due to the greater salience of weight-related issues for individuals who worry about gaining weight (Swami et al., 2010).

Furthermore, for all adolescents in our sample, we detected a direct effect of exposure to the weight loss reality TV show on implicit negative attitudes. In that sense, our entire sample demonstrated increased negative implicit attitudes toward obese individuals following exposure to the kind of reality show that we studied. In line with previous research (e.g., Vartanian et al., 2005), those implicit attitudes were independent from explicit negative ones, which suggests that weight loss reality TV shows foster two independent processes: explicit verbally expressed weight bias and implicit spontaneous, unintentional negative associations with overweight individuals.

Implications and future research

These findings have important theoretical implications. Whereas past research on media priming and stereotyping has almost exclusively focused on racial stereotypes or gender stereotypes, this study extends the literature by investigating the priming effects of body-related media stereotypes. Thus, we examined for the first time how priming adolescents with negative portrayals of obesity in a weight loss reality TV show influences their explicit and implicit weight bias. In doing so, we identified crucial underlying mechanisms and boundary conditions of those media priming effects by examining the mediating role of weight controllability and the moderating role of overweight preoccupation in explicit weight bias. Our findings are in line with previous empirical work (Abraham & Appiah, 2006; Arendt, 2013; Matthes & Schmuck, 2017), supporting the theoretical idea of distinct explicit and implicit media effects. Negative media portrayals of obesity influence explicit attitudes via priming beliefs that weight is controllable, which, in turn, activates related concepts such as negative explicit attitudes toward obese individuals. However, in line with previous research (e.g., Matthes & Schmuck, 2017), this effect on explicit attitudes is limited to a specific subgroup of individuals (i.e., those who worry about being overweight). Hence, we can speak of a conditional media effect. Recent media effect theories (e.g., SESAM model, Knobloch-Westerwick, 2015; differential susceptibility model of media effects model, Valkenburg & Peter, 2013) ascribe an important role to this kind of dispositional factors in explaining susceptibility to media effects. Our study contributes to this literature by identifying overweight preoccupation as crucial boundary condition in explaining explicit weight bias in response to media stereotypes. Of course, future research on the moderating role of individual's predispositions is nevertheless necessary. For example, weight bias was shown to be more pronounced among women compared to men (Gray, Simon, Janicke, & Dumont-Driscoll, 2011). In addition, body weight (Schwartz, Vartanian, Nosek, &

Bownell, 2006) and body dissatisfaction (Gray et al., 2011) moderated weight bias. It is up to future research to test these and other relevant moderators in regard to media-induced weight bias.

Besides the effects on explicit attitudes, our study is the first to demonstrate that stereotypical media portrayals of obesity may also automatically affect implicit attitudes. In contrast to the effect on explicit attitudes, the priming effect on implicit attitudes is universal and affects all adolescents. These distinct effects may be explained by a tendency to suppress or control stereotypes or biased attitudes on the explicit level. On the implicit level, however, stereotypical media portrayals exert a direct automatic effect resulting in more negative implicit attitudes toward obese individuals. Yet, individuals may reject these automatic evaluations as a valid basis for an evaluative judgment, which explains the non-significant effect of implicit attitudes on explicit attitudes in our study and the low correlations between these constructs in general (Gawronski & Bodenhausen, 2006). Nevertheless, implicit attitudes are relevant, because researchers have repeatedly shown that explicit and implicit attitudes predict different forms of behavior. Whereas explicit attitudes predict reflected, goal-oriented behavior, implicit attitudes are associated with nonverbal, spontaneous behavior (e.g., Friese, Hofmann, & Schmitt, 2008). In particular, in situations involving low cognitive resources, implicit rather than explicit attitudes drive individuals' thinking and behavior (e.g., Strack, Werth, & Deutsch, 2006). Against that backdrop, strong negative implicit attitudes should increase avoidance-related motivations (Matthes & Schmuck, 2017). In public situations, for instance, such avoidance motivation could prompt the public alienation and social exclusion of obese individuals. In support of that idea, Bessenoff and Sherman (2000) demonstrated that implicit attitudes could better predict how far individuals chose to sit from an obese person than explicit ones. That finding underscores the importance of considering both implicit and explicit attitudes when investigating media effects on individuals' weight bias. Thus, our findings also have clear relevance for other research areas dealing with socially sensitive topics such as stereotypes or biased attitudes. A next step for future research would be to investigate prime intensity and time course of media priming effects in the context of weight bias (Roskos-Ewoldsen et al., 2009).

Our findings also have important implications for society at large and for adolescents in particular. Researchers consider adolescence as a particularly sensitive time of experiences of weight bias, because social relationships with peers are highly salient (Puhl & Latner, 2007). Weight bias among adolescents is problematic, because overweight and obese adolescents face an increased likelihood of being socially marginalized by their peers. For example, adolescents endorsing stigmatizing weight beliefs reported less intentions to engage in social, academic and recreational activities with overweight peers compared to thin peers (Greenleaf et al., 2006). Furthermore, overweight adolescents are less popular (Strauss &

Pollack, 2003), more likely bullied (Kjelgaard et al., 2017), and have less digital communication by phone and/or Internet with friends (Kjelgaard et al., 2017).

Additionally, researchers have indicated that body dissatisfaction is especially prevalent among adolescents during middle and high school (Bucchianeri, Arikian, Hannan, Eisenberg, & Neumark-Sztainer, 2013). Displaying unrealistic weight loss strategies as viable solutions could thus severely harm adolescents' development of a healthy body image in the long term. To prevent negative effects on adolescents' weight bias, reality TV shows need to modify their content in terms of the core messages that they convey. By providing additional context concerning the factors that influence overweight instead of attributing overweight to poor willpower and laziness, they could prevent negative effects on explicit and implicit weight bias.

Limitations

Some limitations of this study should be noted. For one, because we conducted an online survey experiment, we exposed adolescents to video clips of the show *The Biggest Loser Teens* instead of to an entire episode. Nevertheless, we aimed to reflect the core messages of the show by including scenes of emotionally fraught contestants, vigorous exercise, and successful weight loss. All scenes, moreover, implied that the contestants were to blame for their overweight because of their (former) lack of willpower. Accordingly, all scenes conveyed the message that weight is controllable. Furthermore, we showed clips from only one reality program, which limits the generalizability of our findings. However, the show *The Biggest Loser*, which we used as our stimulus, is the most successful weight-loss TV show in the United States with up to 10 million viewers and in Europe (Germany) with up to 2.3 million viewers. Similar shows have copied this format like *Extreme Makeover* or *Extreme Weight Loss* in the United States. Therefore, although we have used only one reality show as our stimulus material, we are confident that our findings have high relevance and do also apply to other reality shows dealing with body image or weight loss. All three clips contained messages which are typical for these kind of shows. Additionally, we exposed participants not only to one, but to three short clips from different episodes of *The Biggest Loser Teens* to give participants a broad overview of the topics included in this show, which are also comparable to other weight loss shows. Also, we presented two different candidates: a female and a male candidate struggling with their weight loss to enhance the generalizability of our findings. Nevertheless, we suggest that researchers should include several reality shows as media priming material in future studies. Another limitation was that we did not conduct the experiment in a controlled laboratory setting. As such, we could not determine how attentive participants were to the stimulus material or how conscientiously they completed the implicit measurement procedure and questionnaire. Additionally, to rule out

technical problems, participants answered control questions regarding the implicit measurement procedure.

Conclusion

In sum, we have demonstrated the media priming effects of reality weight loss reality TV shows on adolescents' implicit and explicit weight bias. Our findings indicate that for individuals who fear being obese, weight loss reality TV shows reinforce negative explicit attitudes toward obese individuals by activating the perception of weight controllability. Moreover, exposure to TV shows enhanced negative implicit attitudes toward obese individuals among all adolescents sampled. Altogether, our results highlight the role of media in perpetuating weight bias.

Acknowledgments

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Appendix

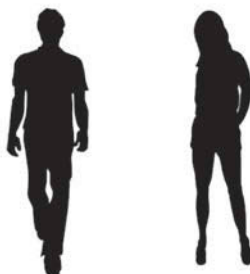
Weight controllability. Fat people can lose weight if they really want to. With a combination of exercise and dieting, anyone can lose weight and keep it off indefinitely. The medical problems that overweight people have are their own fault. Weight is under a person's control. People who weigh too much could lose at least some of their weight with a little exercise. Some people are fat because they have no willpower. Fat people tend to be fat pretty much because it is their own fault.

Overweight preoccupation. I feel disgusted with myself when I gain weight. One of the worst things that could happen to me would be if I gained 10 kg. I worry about becoming fat.

Explicit attitudes toward obese individuals. Obese people make me feel somewhat uncomfortable. I have a hard time making friends with obese people. I find obese people repulsive. I don't like it when an obese person sits next to me on public transportation. I try to avoid obese people. I don't think it's good to surround oneself with too many obese people. Obese people have a bad influence on others. I could never fall in love with an obese person.

Liking of weight loss reality TV Shows. How do you evaluate weight loss reality TV shows in general? Negative-to-positive scale (–77 = I have never seen a weight loss reality TV show before).

AMP example silhouettes non-obese



AMP example silhouettes obese

