



Weight stigma and media: An examination of the effect of advertising campaigns on weight bias, internalized weight bias, self-esteem, body image, and affect

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ABSTRACT

While some media perpetuate weight stigma and an ideal of thinness, certain advertising campaigns, such as Aerie Real and Dove Real Beauty, have attempted to promote body acceptance. The current study evaluated the influence of exposure to these campaigns on weight bias, internalized weight bias (IWB), self-esteem, body image, and affect relative to exposure to a campaign perpetuating the thin ideal and a documentary on weight stigma.

475 female participants were randomized to one of five conditions: Aerie, Dove, Victoria's Secret, an HBO documentary, or control (i.e., neutral video clip). Participants completed measures of weight bias, IWB, self-esteem, body image, and affect one week prior to and immediately after watching the assigned video clip.

Results showed positive effects of the Aerie and Dove campaigns on women. While global measures of weight bias and IWB were unchanged, women who viewed the Dove and Aerie campaigns reported significantly improved self-esteem and positive affect. Further, women found the campaigns to have positive, uplifting, and empowering messages.

Aerie's and Dove's acceptance-promoting advertising campaigns positively influenced self-esteem and mood, and they are potential tools for weight bias reduction. Advertisements and media have the potential to impact weight-based attitudes in society.

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1. Introduction

Weight stigma and bias refer to the negative beliefs, attitudes, and stereotypes about someone due to their weight, most often obesity, and related weight-based discrimination is present in nearly every area of life, including employment, healthcare, education, and relationships (Puhl & Brownell, 2001; Puhl & Heuer, 2009). Common stereotypes regard larger-bodied individuals as lazy, unintelligent, and lacking willpower (Puhl, Moss-Racusin, & Schwartz, 2007), and experiencing weight stigma is associated with distress, binge eating, poor quality of life, and low self-esteem (Lee, Gonzalez, Small, & Thompson, 2019). Internalized weight bias (IWB) occurs when an individual directs such negative weight-based beliefs, attitudes, and stereotypes toward themselves (Durso & Latner, 2008).

Weight stigma and IWB negatively affect mood, self-esteem, body image, mental health, quality of life, and health behaviors, and are associated with increased shame, suicidality, and social isolation (Pearl & Puhl, 2016; Puhl & Heuer, 2009; Ramos Salas, Forhan, Caulfield, Sharma, & Raine, 2019). Furthermore, correlates specific to IWB include binge eating, body dissatisfaction, drive for thinness, and avoidance of exercise (Carels et al., 2010; Durso & Latner, 2008; Pearl, Puhl, & Dovidio, 2015; Vartanian & Novak, 2011). While IWB, body image, and self-esteem are highly correlated (Durso & Latner, 2008; Durso, Latner, & Ciao, 2016; Pop, 2016), they are distinct constructs. Negative beliefs and attitudes about oneself specifically due to excess weight constitute IWB, while body image is formed by the self-evaluation of many aspects of one's body features, not solely bodyweight (Cash, 1994). Self-esteem encompasses a more general evaluation of one's worth, self-acceptance, and self-respect (MacDonald & Leary, 2012; Rosenberg, 1965).

A sociocultural theory of body image posits that mass media communicates society's expectations for thinness and beauty (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Media, which encompasses several domains (i.e., news media, social

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media, the internet, television entertainment, and advertising), perpetuates weight stigma by portraying larger-bodied individuals negatively and promoting unrealistic standards regarding appearance, body ideals, and thinness (Ata & Thompson, 2010; Himes & Thompson, 2007; Jobsky, 2014; Lawrence, 2004; Rajendrah, Rashid, & Mohamed, 2017; Rodgers, McLean, & Paxton, 2015). Low mood, poor body image, low self-esteem, and maladaptive eating behaviors have been reported in direct response to viewing weight stigmatizing content (Durso & Latner, 2008; Groesz, Levine, & Murnen, 2002; Pearl, 2018; Tiggemann, Brown, Zaccardo, & Thomas, 2017). And yet, despite the widespread proliferation of such content, viewers would prefer to see positive, non-stigmatizing portrayal of larger-bodied persons and greater body diversity in the media (Pearl, Puhl, & Brownell, 2012; Puhl, Neumark-Sztainer, Austin, Luedicke, & King, 2014; Puhl, Himmelstein, Gorin, & Suh, 2017). For example, individuals were supportive of positive depictions of persons with obesity and insulted and angered by stigmatizing images of persons with obesity (Pearl et al., 2012).

Women report double the frequency of weight-based discrimination as men (Puhl, Andreyeva, & Brownell, 2008), because the thin ideal disproportionately pressures women to conform to a thin body type, and women are more likely to be subjected to weight-based judgments than men (Anixiadis, Wertheim, Rodgers, & Caruana, 2019; Gilbert, Crump, Madhere, & Schutz, 2009; Glauert, Rhodes, Byrne, Fink, & Grammer, 2009; MacNeill & Best, 2015). Women of all sizes perceive, experience, and are negatively affected by weight-based stigma due to internalization of societal body ideals, such as the thin ideal, and sociocultural appearance pressures from family, peers, and media (Falkner et al., 1999; Lee et al., 2019). For instance, beauty and fashion advertising campaigns contribute to low self-esteem and poor body image when they promote an unattainable body ideal for women (Craddock, Ramsey, Spotswood, Halliwell, & Diedrichs, 2019; Martin, 2010; Rodgers, Kruger, Lowy, Long, & Richard, 2019). Researchers have applied social comparison theory to the impact of media on body image and found that evaluating oneself against others impacts body image, and engaging in upward social comparisons (i.e., with models) results in poor body image and affect outcomes (Chrisler, Fung, Lopez, & Gorman, 2013). The impact of upward social comparison on these constructs is increasing as models are younger with smaller body sizes now than they were 25 years ago (Maymone, Laughter, Anderson, Secemsky, & Vashi, 2020). Consistent with this phenomenon, one study found that relative to viewing neutral advertisements, viewing advertisements that portray sociocultural appearance norms, such as Victoria's Secret, resulted in women experiencing lower body satisfaction, more appearance-driven self-esteem, and a greater concern with others' opinions of themselves (Strahan et al., 2008). It has been argued elsewhere that Victoria's Secret campaigns idolize thin, white women, thereby contributing to low self-esteem and poor body image among the majority of women who do not meet unrealistic standards of the thin ideal (Chrisler et al., 2013; Heinberg & Thompson, 1995). Given Victoria Secret's decline in revenue and consequent store closings since 2017 due to lower consumer engagement with its brand and marketing strategies, it is beneficial for companies to understand how consumers' reactions to their advertisements influence sales (Feng, 2019). Research findings suggest that advertisements using average-sized and plus-sized models result in women experiencing less body-focused anxiety and social comparison and higher body satisfaction while still effectively advertising their products (Clayton, Ridgway, & Hendrickse, 2017; Halliwell & Dittmar, 2004).

The promotion of the thin ideal in media as a perpetuation of weight bias and the detrimental effects of weight bias and IWB on physical and mental health are well-documented, but few studies have examined how portrayal of the thin ideal influences weight-

stigmatizing attitudes (Ata & Thompson, 2010; Himes & Thompson, 2007). Furthermore, the development of novel approaches to weight-bias reduction interventions is needed (Lee, Ata, & Brannick, 2014), and examining the effect of advertising campaigns promoting a positive body image through acceptance of diverse body types on weight bias and IWB would be a novel avenue to explore. Although the relationship between media exposure and IWB has yet to be directly examined, a recently developed model suggests that internalization of societal body ideals and the cumulative effects of sociocultural appearance-related pressures contribute more to university students' IWB and body image than stigmatizing experiences themselves (Lee et al., 2019).

By contrast, exposure to educational media clips may offset thin-ideal internalization and reduce negative beliefs about individuals whose body sizes and physical appearances deviate from societal ideals. One study used a video showing how images of women are digitally altered; adolescent girls in the United Kingdom who viewed the video reported lower body dissatisfaction (Halliwell, Easun, & Harcourt, 2011). Another study on media and weight-bias reduction examined the impact of a 17-minute segment of the HBO documentary *The Weight of the Nation* on weight bias (Burmeister, Taylor, Kiefner-Burmeister, Borushok, & Carels, 2017). The media clip provided education on weight stigma, positively portrayed obese individuals, and included interviews with obese individuals on their difficulties with weight-stigmatizing experiences. The participants who viewed the documentary segment reported significantly reduced negative judgements of persons with obesity while there was no change within the control group (Burmeister et al., 2017).

Major companies, such as Dove and Aerie, demonstrated efforts to intentionally undermine the thin ideal and promote positive body image in advertising campaigns geared toward women. Dove, a unit of Unilever selling hygiene and hair styling products, launched its "Campaign for Real Beauty" in 2004 using average-sized, ethnically diverse women without re-touching their genuine appearance to raise awareness of the discriminatory effects of current societal beauty standards. As part of this campaign, Dove presented a series of videos highlighting the stigma and discrimination of various beauty standards, including a video on the negative consequences of weight stigma. A decade later, Aerie, a unit of American Eagle Outfitters selling lingerie and outer apparel, launched the "Aerie Real" campaign in 2014 featuring non-model women and non-retouched images to communicate a message empowering women to love their "real" selves and place value on more than their physical appearance. The Aerie campaign videos have a light, upbeat energy, tempo, and message in contrast to the more serious tone of the Dove campaign's videos and advertisements that focus on the detrimental consequences of weight stigma.

Notwithstanding Dove and Aerie's positive aspirations, empowerment-themed advertisements have been criticized for an apparent disparity between communicating a narrative of empowerment while still visually portraying women in undergarments, which still resembles traditional, objectifying advertising campaigns (Couture Bue & Harrison, 2019). Several studies have evaluated whether the Dove Real Beauty campaign conveyed a true feminist message and concluded that the campaign was "better than nothing," (Taylor, Johnston, & Whitehead, 2016, p. 140), but there is a need to improve ethnic and body-size diversity and a concern about viewing a corporation as an agent of social change for women (Murray, 2013; Scott & Cloud, 2008; Taylor et al., 2016).

Extant research has begun to investigate the effects of progressive, body positive advertisements on its viewers. A study comparing the emotional responses to "body-positive" advertisements and traditional beauty advertisements found the body-positive advertisements elicited stronger emotional

responses than the traditional advertisements, but they did not reduce thin-ideal internalization (Kraus & Myrick, 2018). The authors (2018) concluded that viewing a video clip one time does not undo a lifetime of internalizing the thin ideal, consistent with theories underlying the concept of IWB. In another study, a sample of 200 female undergraduate students viewed three different images of either retouched Aerie images (from before the Aerie Real campaign) or non-retouched images (from the Aerie Real campaign) for 30 s (Convertino, Rodgers, Franko, & Jodoin, 2016). Participants who rated highly in their tendency to engage in appearance comparison had less body dissatisfaction upon viewing the non-retouched images compared to the retouched images, but there was no difference in body satisfaction among the sample as a whole (Convertino et al., 2016). A more recent study observed an overwhelmingly positive response to the ethnic and body diversity in Aerie Real campaign print images compared to traditional advertisements promoting the thin ideal among undergraduate women (Rodgers, Kruger et al., 2019). However, the images' effect on body image was uncertain, with some participants noting that the models were still sized closer to the thin ideal than not. Research thus far shows a mixed impact of the Dove Real Beauty and Aerie Real campaigns, including that they would be more effective if they increased body size and ethnic diversities. Additionally, the impact of these campaigns on body image and weight bias warrants further evaluation.

The current study aimed to explore the effects of the Dove Campaign for Real Beauty and the Aerie Real campaign on weight bias, IWB, self-esteem, body image, positive affect, and negative affect. The public accessibility of these advertisements enhances the ecological validity of the current study, which seeks to explore the significant clinical importance for the emerging field of weight-bias reduction interventions. Additionally, video advertisements have not been studied as much as print advertisements (e.g., Bessenoff, 2006; Convertino et al., 2016; Furnham, 2019), thus, this study aims to provide initial methodological and theoretical groundwork for future research on the video medium.

In spite of their widespread dissemination, the Aerie and Dove campaigns have yet to be experimentally evaluated as to whether differences exist between the distinct deliveries of messages about female body image and weight stigma. In particular, the positive, empowerment message from Aerie that women are more than their bodies, as compared with the interview-format, educational content of Dove highlighting negative effects of weight bias for women, is a contrast worthy of evaluation. The Dove campaign incorporates educational aspects about weight stigma toward women, which mirrors the HBO documentary's educational efforts in Dove's more casual format. Therefore, we expected exposure to Dove to be associated with more similar outcomes to HBO than to Aerie, and we expected exposure to Aerie, Dove, and HBO to be associated with better outcomes than the traditional, thin-ideal promoting Victoria's Secret campaign. Our study aims to identify the differences between a more educational message and a more uplifting message. Our comparison between the Aerie and Dove conditions on weight bias, IWB, self-esteem, body image, and affect outcomes were exploratory.

2. Methods

2.1. Participants

Participants were female students over 18 years of age enrolled in an introductory psychology course at a large southeastern university. The a priori statistical power analyses were conducted using G*Power 3.1 to compute the sample size necessary to detect a small effect for a repeated measures between-within interaction

(Faul, Erdfelder, Buchner, & Lang, 2009). It was determined that a sample size of 470 would be required to detect a small effect size for a between-within interaction, and the final sample size for the current study was 475. Participants were compensated with course credits.

2.2. Procedure

The current study was conducted entirely online and was intentionally described vaguely as evaluating reactions to media. Upon reading the online informed consent, participants provided electronic consent to participate in the research. All participants completed the online baseline survey via Qualtrics (Part 1). During Part 1, participants created a 5-character code of numbers and letters, ensuring anonymity. One week after completing the baseline survey, participants were prompted to complete Part 2 of the study via the university's research participation system. Separating Part 1 and Part 2 by one week curtailed potential priming and instrument reactivity related to the research aims. During Part 2, participants were asked to enter the code they created during Part 1 to match the data points from Part 1 and Part 2. Participants were then randomized using Qualtrics to one of five groups exposed to different videos: Aerie, Dove, Victoria's Secret, HBO, or control. After they watched the corresponding video clip, participants completed a series of post-intervention questions and measures. Aside from reactions to the video, which were only measured post-intervention, all study variables were measured one week prior and immediately after video exposure.

2.3. Materials

The group assigned to the Aerie condition watched the Aerie Real campaign video called "The Share Your Spark Experience" (2 min, 32 s), which was described as including "real" women in the campaign to "ignite empowerment and share their positive vibes" (Aerie, 2016). The video portrays women in Aerie undergarments who appear happy and confident in their bodies with uplifting music in the background. Various voices discuss the message of self-confidence and the importance of loving the person you are on the inside.

The condition assigned to Dove viewed a video titled, "Beauty standards of weight are a form of bias" (2 min), designed to raise awareness of the negative effects of weight stigma among women (Dove U.S., 2016). In this clip, women are interviewed on the street with questions such as "Would you ever lose weight to make more money?" and discusses how "beauty standards of body size" negatively affect women in the workplace.

Participants in the HBO condition viewed a 2-minute, 42-second minute clip (from 10:28 to 13:10) of the "Stigma" segment of *Weight of the Nation* (Hoffman & Chaykin, 2012). This clip was selected because it discusses weight stigma in the media, the negative portrayals of obese individuals in media, and the "strict ideals for female physical attractiveness in our culture." Commentary by Dr. Rebecca Puhl, an expert in the area of weight stigma, covers how even non-overweight women who do not fit the thin ideal are also vulnerable to weight stigma while men are not held to the same strict body ideals. The Stigma segment of *Weight of the Nation* previously demonstrated the ability to reduce weight bias (Burmeister et al., 2017) and, therefore, could serve as a suitable video-based condition to assess for the relative effectiveness of the two aforementioned advertising campaigns.

Participants assigned to the Victoria's Secret condition watched a media clip titled "Victoria's Secret Dream Angels Commercial 2018" (2 min, 29 s), a stereotypical example of an advertising campaign that promotes weight stigma by displaying very thin women

in Victoria's Secret undergarments with upbeat background music (TV Shows, 2018).

Participants in the control condition watched the first 2 min 30 s of a neutral video, a documentary clip about Denali National Park and Preserve in Alaska, which was selected to control for any effects related to simply watching a video and completing the measures a second time (Sigma Documentaries, 2016).

2.4. Measures

2.4.1. Demographics

Participants were asked to provide demographic information, including their age, gender, race/ethnicity, and self-reported height and weight. Participants were also asked about attempts to lose weight or change their body shape, history of an eating or exercise disorder, and any current exercise routine.

2.4.2. Reactions to the video

In order to capture participants' reactions to their randomly assigned video, they were asked to rate how true or false seven statements were on a scale from one (Very False) to five (Very True). These items asked about the video's impact on their acceptance of diverse body shapes and sizes, the video's production quality, how the video made them feel about themselves or their bodies, if they liked the video, if they found the video to be entertaining, how the video affected their liking of persons with overweight and obesity, and whether the video had a positive, uplifting, and empowering message. The development of these items was based, in part, on the "public attitudes" statements developed by Puhl et al. (2012).

2.4.3. Weight Bias

Weight bias was measured using the Antifat Attitudes Questionnaire (AFA), which is a 13-item scale assessing explicit weight bias (Crandall, 1994). The AFA produces three subscales: dislike (antipathy toward individuals with overweight), fear of fat (personal fear of being overweight), and willpower (controllability beliefs). A Likert scale from zero (very strongly disagree) to nine (very strongly agree) is used to assess respondents' agreement with the items. Higher scores indicate a greater degree of weight bias. The AFA has a good internal consistency for the three subscales: dislike ($\alpha = .84$), fear of fat ($\alpha = .79$) and willpower ($\alpha = .66$).

2.4.4. Internalized weight Bias

IWB was measured using the Weight Bias Internalization Scale-Modified (WBIS-M; Pearl & Puhl, 2014), which applies the original 11-item WBIS (Durso & Latner, 2008) to all BMIs as opposed to only individuals with overweight. Respondents answer using a Likert scale from one (strongly disagree) to seven (strongly agree). Higher scores indicate greater degrees of IWB. The WBIS-M demonstrated strong internal consistency ($\alpha = 0.94$) in a sample of a diverse range of bodyweight classifications, from underweight to obese (Pearl & Puhl, 2014).

2.4.5. Self-Esteem

Self-esteem was measured using the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965, 1979), which consists of 10 items assessing self-worth and self-esteem on a Likert scale from one (strongly disagree) to four (strongly agree). Higher scores indicate higher self-esteem. The RSES has demonstrated good internal consistency across a variety of samples, with Cronbach's alpha ranging from .72 to .90 (Gray-Little, Williams, & Hancock, 1997; Robins, Hendin, & Trzesniewski, 2001).

2.4.6. Body image

Body image was measured using the Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002),

which is a six-item assessment of momentary evaluative and affective body image experiences. Respondents assess how they feel in the moment about their body with items beginning with phrases such as "Right now I feel. . ." and nine possible responses ranging from extremely satisfied to extremely dissatisfied. Higher scores on the scale indicate better body image. The BISS demonstrated good internal consistency in a neutral context ($\alpha = 0.77$), negative contexts ($\alpha = 0.88$, $\alpha = 0.90$), and positive contexts ($\alpha = 0.80$, $\alpha = 0.81$) among a sample of women (Cash et al., 2002).

2.4.7. Positive and negative affect

Affect was assessed with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Respondents are asked to indicate to what extent "you feel this way right now, that is, at the present moment" for 10 positive and 10 negative affect descriptors on a five-point Likert scale ranging from one (very slightly or not at all) to five (extremely). A higher score on each subscale indicates a higher degree of that affect. The positive affect ($\alpha = 0.89$) and negative affect ($\alpha = 0.85$) subscales demonstrated good internal consistency.

2.5. Data analyses

All data analyses were performed using the Statistical Package for Social Sciences, Version 25. Descriptive and frequency statistical analyses were performed to describe the sample characteristics, such as age, ethnicity, BMI, weight loss history, eating disorder history, and current physical activity routine. One-way between-groups ANOVAs were conducted to determine if conditions differed on age or BMI. Chi-square tests for independence were conducted to examine group differences by BMI category, ethnicity, previous weight loss attempts (yes or no), the presence of an eating or exercise disorder history (yes or no), and engagement in a physical activity routine (yes or no).

Pearson correlation coefficient analyses were conducted to determine relationships between outcome variables at baseline. A series of one-way between-groups ANOVAs were conducted to determine differences in responses to the video reaction statements between each condition. Differences within and between the five groups were examined using mixed between-within repeated measure ANOVAs with post-hoc comparisons. One-way between-groups ANOVAs were conducted on change in outcome variables between the five groups when there was a significant time by condition interaction to determine where the interaction occurred.

3. Results

3.1. Demographics

The current study enrolled 704 female undergraduate psychology students at a large southeastern university and 506 participants completed the entire study. Invalid responses ($n = 2$) and lack of a matching participant ID for pre-post data ($n = 29$) resulted in a final sample of 475 participants for data analyses. Participants were randomized at Part 2 to one of five conditions: Aerie Real Advertisement ($n = 97$), Dove Real Beauty Advertisement ($n = 97$), HBO Documentary ($N = 88$), Victoria's Secret Advertisement ($n = 101$), or control ($n = 92$).

The sample had the following characteristics: $M(SD)$ age = 18.55 (1.36), $M(SD)$ BMI = 24.89 (6.00), 4.6 % underweight ($n = 22$), 59.2 % average weight ($n = 281$), 20.8 % overweight ($n = 99$), and 13.7 % obese ($n = 65$). Participants identified as 4.8 % Asian or Pacific Islander ($n = 23$), 8.7 % Black or African American ($n = 89$), 6.3 % Hispanic or Latino ($n = 30$), 66.1 % White ($n = 314$), and 4.0 % Other ($n = 19$: Black and Hispanic: $n = 2$, Asian and White: $n = 4$, Black and White: $n = 5$, Hispanic and White: $n = 1$, White and Native

Table 1
Demographic Information by Condition.

Demographics		Aerie	Dove	HBO	Victoria's Secret	Control
Age	M (SD)	18.49 (.87)	18.45 (.99)	18.73 (2.60)	18.56 (.68)	18.51 (.88)
BMI	M (SD)	24.76 (5.07)	24.92 (5.06)	24.85 (5.07)	24.85 (7.03)	25.10 (6.84)
Underweight	N (%)	2 (2.1)	4 (4.1)	6 (6.9)	4 (4.0)	6 (6.7)
Normal weight	N (%)	58 (61.7)	53 (54.6)	48 (55.2)	68 (68.7)	54 (60.0)
Overweight	N (%)	22 (23.4)	26 (26.8)	23 (26.4)	11 (11.1)	17 (18.9)
Obese	N (%)	12 (12.8)	14 (14.4)	10 (11.5)	16 (16.2)	13 (14.4)
Ethnicity						
Asian or Pacific Islander	N (%)	5 (5.2)	7 (7.2)	2 (2.3)	3 (3.0)	6 (6.5)
Black or African American	N (%)	17 (17.5)	17 (17.5)	16 (18.2)	18 (17.8)	21 (22.8)
Hispanic or Latino	N (%)	10 (10.3)	6 (6.2)	4 (4.5)	6 (5.9)	4 (4.3)
White	N (%)	63 (64.9)	64 (66.0)	61 (69.3)	70 (69.3)	56 (60.9)
Other	N (%)	2 (2.1)	3 (3.1)	5 (5.7)	4 (4.0)	5 (5.4)
Weight loss history						
Yes	N (%)	69 (71.1)	65 (67.0)	52 (59.1)	68 (67.3)	64 (69.6)
No	N (%)	28 (28.9)	32 (33.0)	36 (40.9)	33 (32.7)	28 (30.4)
Eating or exercise disorder history						
Yes	N (%)	8 (8.2)	6 (6.2)	5 (5.7)	4 (4.0)	8 (8.7)
No	N (%)	89 (91.8)	91 (93.8)	83 (94.3)	97 (96.0)	84 (91.3)
Current physical activity routine						
Yes	N (%)	49 (50.5)	55 (56.7)	53 (60.2)	51 (50.5)	52 (56.5)
No	N (%)	48 (49.5)	42 (43.3)	35 (39.8)	50 (49.5)	40 (43.5)

Note. M (SD) = Mean (Standard Deviation). n (%) = Number of participants (percentage of sample). There were no significant differences between conditions.

American: $n = 1$, Biracial, Mixed, or Multiracial: $n = 6$). The descriptors for “Other” include the responses the participants submitted. For example, some participants wrote “Black and Hispanic” while other participants wrote “Biracial.” There were no significant differences in demographic variables among experimental conditions. Please reference Table 1 for means and standard deviations or frequency percentages of demographic data within each experimental condition.

3.2. Baseline correlations

Pearson correlation coefficient analyses were conducted to determine relationships between outcome variables at baseline (see Table 2 for correlation coefficients and levels of statistical significance). Higher weight bias was significantly correlated with lower self-esteem and worse body image, and all weight bias subscales (dislike, fear of fat, and willpower) were positively correlated with one another. Higher fear of fat was significantly correlated with higher IWB, higher negative affect, lower self-esteem, and lower body image. Higher IWB was significantly correlated with higher willpower and negative affect, as well as lower self-esteem, body image, and positive affect. Higher self-esteem was significantly correlated with higher body image and positive affect, as well as lower negative affect. Body image and negative affect revealed a significant inverse relationship.

3.3. Video reactions

A series of one-way between-groups ANOVAs were conducted to determine differences among the reactions to the videos for each condition, and we found the Aerie and Dove campaign videos were generally perceived similarly and received more positive reactions than the other three conditions. Means and standard deviations are presented in Table 3.

The statement “The video made me more accepting of diverse body shapes and sizes,” $F(4, 470) = 194.47, p < .001$, was endorsed significantly more for Aerie, Dove, and HBO than for Victoria's Secret and control, $p < .001$. There were no significant differences among Aerie, Dove, and HBO groups or between Victoria's Secret and control.

The next six statements' analyses resulted in a Levene's test for homogeneity of variances value $< .05$, which indicated that the

assumption of homogeneity of variance was violated, so an asymptotically F distributed was reported using the Brown-Forsythe test. Participants in the Victoria's Secret condition agreed with “The video made me feel bad about myself or my body,” $F(4, 376.23) = 52.37, p < .001$, significantly more than participants in the Aerie, Dove, HBO, or control conditions, $p < .001$. Participants in the HBO condition agreed with this statement significantly more than participants in the Aerie ($p = .003$) and control ($p = .001$) conditions. There were no significant differences between HBO and Dove, Aerie and Dove, or Aerie and control.

Participants who viewed the Victoria's Secret video agreed with “The video made me dislike persons with overweight and obesity,” $F(4, 327.42) = 3.49, p = .009$, significantly more than participants who viewed the Aerie, Dove, or control videos, $p < .05$. There were no significant differences among Aerie, Dove, HBO, and control or between HBO and Victoria's Secret.

Participants in the Aerie and Dove groups agreed with “The video had a positive, uplifting, and empowering message,” $F(4, 367.39) = 191.22, p < .001$, significantly more than participants in the other three groups, $p < .001$. Participants in the HBO group agreed with this statement significantly more than participants in the Victoria's Secret and control groups, $p < .001$. There were no significant differences between Aerie and Dove or Victoria's Secret and control on how the videos were perceived to have a positive, uplifting, and empowering message.

The statement “The video had a good production quality,” $F(4, 337.79) = 44.25, p < .001$, was rated significantly higher by the Aerie, Dove, and HBO conditions than for the Victoria's Secret and control conditions, $p < .001$. Participants in the Aerie and Dove groups agreed with this statement significantly more than the HBO group, $p < .001$. Participants in the Victoria's Secret group agreed with this statement significantly more than the control group, $p < .001$. There were no significant differences between Aerie and Dove on their perceived production quality.

The significant differences between groups for “I liked the video,” $F(4, 404.03) = 75.00, p < .001$, were the control group liked the Denali National Park video significantly less than the other four conditions liked their respective videos, $p < .05$, while participants in the Aerie and Dove groups liked their videos significantly more than the participants in the VS and HBO groups liked their videos, $p < .01$, and participants in the HBO group liked their video more than participants in the VS liked their video, $p < .001$. There were

Table 2
Correlations Between Outcome Variables at Baseline (n = 475).

Variables	1	2	3	4	5	6	7	8
1 Weight stigma dislike	–							
2 Weight stigma fear	.30***	–						
3 Weight stigma willpower	.50***	.40***	–					
4 Internalized weight bias	0.03	.54***	.11*	–				
5 Self-esteem	–0.04	–.32***	–.04	–0.58***	–			
6 Body image	–.04	–.26***	–.04	–.27***	.11*	–		
7 Positive affect	0.01	–0.08	0.04	–0.20***	.42***	0.02	–	
8 Negative affect	0.04	.21***	0.08	.32***	–.44***	–.14**	–0.08	–

* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 3
Average Response Ratings to Video Reaction Statements by Condition.

Statement	Aerie		Dove		HBO	Control	Victoria's Secret		
	M	SD	M	SD	M	SD	M	SD	SDM
The video made me more accepting of diverse body shapes and sizes.	4.35 ^{ab}	1.00	4.21 ^{cd}	0.95	4.15 ^{ef}	1.01	1.72 ^{ace}	1.09	0.9851 ^{bdf}
The video made me feel bad about myself or my body.	1.23 ^{ab}	0.73	1.40 ^{cd}	0.93	1.65 ^{aef}	1.06	2.83 ^{bceg}	1.28	0.5615 ^{dfg}
The video made me dislike persons with overweight and obesity.	1.01 ^a	0.10	1.09 ^b	0.48	1.13	0.48	1.23 ^{abc}	0.62	0.2907 ^c
The video had a positive, uplifting, and empowering message.	4.87 ^{abc}	0.42	4.60 ^{def}	0.92	3.38 ^{adgh}	1.28	1.81 ^{beg}	1.05	1.1205 ^{efh}
The video had a good production quality.	4.78 ^{abc}	0.56	4.62 ^{def}	0.59	3.89 ^{adgh}	1.04	3.85 ^{begi}	1.16	0.9808 ^{efhi}
I liked the video.	4.64 ^{abc}	0.70	4.44 ^{def}	0.85	4.02 ^{adgh}	1.12	2.93 ^{begi}	1.19	1.2655 ^{efhi}
The video was entertaining.	4.28 ^{abc}	0.97	4.01 ^{def}	1.07	3.49 ^{adgh}	1.24	2.70 ^{begi}	1.33	1.1815 ^{efhi}

Notes. M = Mean, SD = Standard Deviation. Averages range from 1 = very false to 5 = very true. Group means sharing superscripts within the same row are statistically different from each other at the .05 level. See text for *F* statistics and *p* values.

no significant differences between how much participants liked the Aerie and Dove videos.

Participants in the control group found their video to be significantly less entertaining, $F(4, 447.12) = 56.32$, $p < .001$, than the other four groups, $p < .001$, while participants in the Aerie and Dove groups found their video to be significantly more entertaining than the participants in the VS and HBO groups, $p < .01$, and participants in the HBO group found their video to be significantly more entertaining than participants in the VS group, $p < .001$. There were no significant differences between Aerie and Dove on entertainment value.

3.4. Repeated measures

A series of mixed between-within subjects ANOVAs were conducted to assess for significant differences between the five conditions in change on the nine outcome variables (5×2 condition $\times$ time interaction). See Table 4 for means and standard deviations. For the few significant interactions of condition by time observed, Tukey HSD post hoc tests determined which groups differed on each measure.

3.4.1. Weight Bias and IWB

The overall sample's report of disliking larger-bodied individuals was low, $M(SD)_{pre} = 1.87 (1.02)$ and $M(SD)_{post} = 1.84 (1.13)$. The interaction effect of the dislike weight bias subscale approached significance, $F(4, 470) = 2.26$, $p = .062$, $\eta_p^2 = .019$. The main effects for time, $F(1, 470) = .76$, $p = .383$, $\eta_p^2 = .002$, and condition, $F(4) = .80$, $p = .525$, $\eta_p^2 = .007$, were not significant. To interpret the interaction effect that approached significance, a one-way between-groups ANOVA was conducted on the change in dislike between conditions, $F(4, 470) = 2.26$, $p = .06$. Post hoc analyses determined that the change in dislike diminished for Aerie and increased for Vic-

toria's Secret, and the conditions were significantly different from each other, $p = .01$. There were no significant differences on changes in dislike among the other conditions, $p > .05$.

The total sample endorsement of fear of fat was above the midpoint of the scale, $M(SD)_{pre} = 5.17 (2.54)$ and $M(SD)_{post} = 4.76 (2.52)$. There was no significant interaction between condition and time on fear of fat, $F(4, 470) = .33$, $p = .856$, $\eta_p^2 = .003$. The overall sample's weight bias beliefs regarding willpower were moderately high, $M(SD)_{pre} = 4.06 (2.07)$ and $M(SD)_{post} = 3.70 (1.96)$. The interaction effect on weight bias (willpower) was not significant, $F(4, 470) = 1.96$, $p = .099$, $\eta_p^2 = .02$. Regarding IWB, the sample reported $M(SD)_{pre} = 2.96 (1.48)$ and $M(SD)_{post} = 2.88 (1.45)$, and the interaction effect was not significant, Wilks' Lambda = .99, $F(4, 470) = 1.16$, $p = .327$, $\eta_p^2 = .01$.

3.4.2. Self-esteem and body image

The sample's self-esteem was $M(SD)_{pre} = 19.87 (5.70)$ and $M(SD)_{post} = 20.43 (5.64)$. The interaction effect of self-esteem was significant, Wilks' Lambda = .98, $F(4, 470) = 3.05$, $p = .017$, $\eta_p^2 = .03$. The main effect for time was significant, Wilks' Lambda = .97, $F(1, 470) = 13.25$, $p < .001$, $\eta_p^2 = .03$. The main effect for condition was not significant, $F(4) = .26$, $p = .91$, $\eta_p^2 = .002$. To interpret the significant interaction effect, a one-way between-groups ANOVA was conducted on the change in self-esteem between conditions, $F(4, 470) = 3.05$, $p = .02$. Post hoc analyses determined that the changes in self-esteem for Aerie ($p = .03$) and Dove ($p = .01$) were significantly greater than the changes in self-esteem for Victoria's Secret and Control. Self-esteem increased in the Aerie and Dove conditions and decreased slightly in the Victoria's Secret condition. There were no significant differences among Aerie, Dove, and HBO or between Victoria's Secret and Control on changes in self-esteem, $p > .05$. The overall sample's body image was slightly above average, $M(SD)_{pre} = 4.78 (.73)$ and $M(SD)_{post} = 4.84 (.63)$. The interaction

Table 4
Average Pre-Post Scores by Condition and Total Sample.

Variable	Aerie		Dove		HBO		Victoria's Secret		Control	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Dislike	2.01 (1.17)	1.81 ^A (1.18)	1.77 (.99)	1.82 (1.18)	2.06 (1.14)	1.95 (1.23)	1.75 (.86)	1.86 ^A (1.11)	1.80 (.88)	1.79 (.92)
Fear of Fat	5.32 (2.44)	4.78 (2.51)	5.17 (2.63)	4.89 (2.47)	5.50 (2.50)	5.15 (2.52)	4.91 (2.48)	4.50 (2.47)	4.97 (2.65)	4.51 (2.64)
Willpower	4.02 (2.04)	3.33 (1.83)	4.04 (2.08)	3.73 (1.87)	4.30 (2.09)	4.03 (2.02)	4.17 (2.11)	3.77 (2.04)	3.78 (2.05)	3.70 (2.01)
Internalized weight bias	3.14 (1.46)	3.00 (1.52)	3.06 (1.68)	2.91 (1.60)	2.80 (1.39)	2.87 (1.41)	2.95 (1.46)	2.90 (1.36)	2.81 (1.38)	2.70 (1.35)
Self-esteem	19.51 (5.47)	20.50 ^{AB} (5.77)	19.34 (5.76)	20.57 ^C (5.72)	20.24 (5.93)	20.95 (5.38)	19.97 (5.63)	19.90 ^{AC} (5.50)	20.33 (5.80)	20.27 ^{BC} (5.87)
Body image	4.68 (.75)	4.84 (.68)	4.88 (.82)	4.90 (.58)	4.85 (.68)	4.91 (.60)	4.62 (.64)	4.70 (.68)	4.86 (.74)	4.87 (.59)
Positive affect	27.12 (8.84)	31.75 ^{ABCD} (8.50)	26.35 (8.07)	27.95 ^{AEEG} (8.23)	27.89 (8.34)	26.57 ^{BEHI} (8.06)	28.26 (7.97)	23.63 ^{CFH} (8.29)	26.67 (8.21)	21.64 ^{DGI} (8.51)
Negative affect	17.26 (6.14)	13.84 ^A (5.03)	16.69 (6.15)	14.68 (5.47)	17.55 (6.26)	17.02 ^{AB} (5.82)	17.40 (6.71)	14.76 (5.59)	16.90 (6.66)	13.52 ^B (4.51)

Notes. Conditions with group "Post" means sharing superscripts within the same row indicate the change from pre to post is statistically different between conditions at the .05 level. See text for *F* statistics and *p* values.

effect for body image was not significant, Wilks' Lambda = 1.00, $F(4, 470) = .56$, $p = .695$, $\eta_p^2 = .01$.

3.4.3. Affect

The sample as a whole reported a positive affect above the mid-point of the scale, $M(SD)_{pre} = 27.26(8.29)$ and $M(SD)_{post} = 26.33(9.00)$, and the interaction effect was significant, Wilks' Lambda = .82, $F(4, 470) = 25.80$, $p < .001$, $\eta_p^2 = .18$. The main effects for time, Wilks' Lambda = .99, $F(1, 470) = 6.72$, $p = .01$, $\eta_p^2 = .01$, and condition were significant, $F(4) = 6.68$, $p < .001$, $\eta_p^2 = .05$. To interpret the significant interaction effect, a one-way between-groups ANOVA was conducted on the change in positive affect between conditions, $F(4, 470) = 25.80$, $p < .001$. Post hoc analyses determined that the change in positive affect for Aerie was significantly greater than the change in positive affect for Victoria's Secret, $p < .001$, Control, $p < .001$, HBO, $p < .001$, and Dove, $p = .01$. The change in positive affect for Dove was significantly greater than the change in positive affect for HBO, $p = .01$, Victoria's Secret, $p < .001$, and Control, $p < .001$. The decrease in positive affect for Victoria's Secret and Control was significantly greater than the decrease in positive affect for HBO, $p < .01$. There were no differences on changes in positive affect between Victoria's Secret and Control, $p = .72$.

The sample as a whole reported a moderately low negative affect, $M(SD)_{pre} = 17.16(6.37)$ and $M(SD)_{post} = 14.73(5.42)$, and the interaction effect was significant, Wilks' Lambda = .97, $F(4, 470) = 25.80$, $p = .01$, $\eta_p^2 = .03$. The main effect for time was significant, Wilks' Lambda = .87, $F(1, 470) = 70.42$, $p < .001$, $\eta_p^2 = .13$. The main effect for condition approached significance, $F(4) = 2.32$, $p = .056$, $\eta_p^2 = .02$. To interpret the significant interaction effect, a one-way between-groups ANOVA was conducted on the change in negative affect between conditions, $F(4, 470) = 3.37$, $p = .01$. Post hoc analyses determined that the decreases in negative affect for Control, $p = .02$, and Aerie, $p = .01$, were significantly greater the decrease in negative affect for HBO. There were no significant differences on changes in negative affect among Aerie, Dove, Victoria's Secret, and Control, or among HBO, Dove, and Victoria's Secret, $p > .05$.

4. Discussion

The current study focused on examining the influence of body-positive advertising campaigns, specifically the Dove for Real Beauty and Aerie Real campaigns, on weight bias, internalized weight bias, self-esteem, body image, positive affect, and negative affect among female undergraduates. The campaigns were compared to a prototypical, thin-idealizing advertisement (Victoria's Secret), an educational approach to weight bias reduction (an excerpt from an HBO documentary), and a control video. It was

hypothesized that the women who viewed Aerie, Dove, or HBO would report a greater reduction in weight bias, IWB, and negative affect, and a greater increase in self-esteem, body image, and positive affect, than participants who viewed Victoria's Secret or the control. However, our examination of differences between the two progressive campaigns was exploratory in nature, because it was novel to compare an uplifting, positive message with an educational, informative message about women's bodies in an advertising campaign video medium on the targeted outcome variables. Overall, exposure to the Aerie, Dove, and HBO videos was associated with similar improvements in outcome variables, and reported reactions to the videos showed Aerie and Dove were perceived in comparable ways. The main distinction between the exposure to the Dove and Aerie videos was that exposure to the Aerie video was also associated with increased positive affect.

Strong differences in weight-based attitudes emerged when participants were specifically asked how the videos made them feel. For example, women who viewed the Aerie, Dove, or HBO videos reported that the videos made them feel more accepting of diverse body shapes and sizes than participants who viewed the Victoria's Secret or control videos. The Victoria's Secret campaign generated greater attitudes of dislike toward persons with overweight and obesity than the Aerie, Dove, and control videos, and Victoria's Secret viewers felt worse about themselves and their bodies than women in any other condition. The Aerie, Dove, and HBO videos were associated with comparable terms of participants' reported acceptance of themselves and their bodies. However, the Aerie and Dove videos were liked more than HBO and were regarded as having a more positive, uplifting, and empowering message, better production quality, and greater entertainment value than HBO. Advertising campaigns may be more accessible and enjoyed more by a young, female audience in these areas than a documentary clip, but there were no significant changes on weight-related beliefs or attitudes between these three messaging formats.

Besides a decrease in dislike weight bias after watching the Aerie campaign and an increase in dislike weight bias after watching the Victoria's Secret campaign, the video clips generated limited change on global measures of weight bias and IWB. Although many existing studies have produced minimal reduction in weight bias (Alberga et al., 2016; Lee et al., 2014), we consider possible reasons for the lack of change in weight bias and IWB for the current study. The overall sample endorsed a relatively low level of dislike of larger-bodied persons, so the modest change in this attitude may reflect a floor effect, although we were unable to find research to support this possible explanation. While it is possible the current sample has low weight bias, it is unlikely that weight stigma has diminished significantly among undergraduate

students. A growing recognition that it is not socially acceptable to admit to prejudice against larger-bodied individuals and a reluctance to explicitly endorse such negative attitudes might be more realistic explanations, because people tend to exhibit lower explicit bias relative to implicit bias (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Therefore, examining the perceived acceptability of expressing weight-biased attitudes as well as examining change in implicit bias following media exposure are important areas of future inquiry.

Regarding self-esteem, the women who viewed the Aerie and Dove campaigns reported improved self-esteem compared with the women who viewed the Victoria's Secret and control videos. Considering exposure to the thin ideal in print advertisements has been related to lowered self-esteem (Bessenoff & Sherman, 2000), it is encouraging that the Aerie and Dove video campaigns increased self-esteem. This effect is important as self-esteem is correlated with IWB and general health (Durso & Latner, 2008; Vartanian & Novak, 2011). The impact that a brief advertisement can have on self-esteem, even if the long-term effects are uncertain, is promising. Considering this is the first study to examine these campaigns' effect on self-esteem, the findings would benefit from replication.

The brief videos appeared to have no impact on body image. It is possible that like weight bias and IWB, body image develops over a person's lifetime and is difficult to modify (Cash & Pruzinsky, 1990; Martin, 2010; Tiggemann, 2004). More research is needed to clarify why some research has demonstrated change in body image as a function of exposure to thin-ideal media (Strahan et al., 2008; Want, 2009), but others have not (Anschutz, Engels, Becker, & Van Strien, 2009). A possible explanation is that a stronger identification with portrayed models creates greater change in body dissatisfaction (Bell & Dittmar, 2011). Finally, the sample's body image was not particularly low; in fact, scores were slightly above the midpoint of the scale, which may have limited the opportunity for the videos to have a significant effect on body image.

Women who viewed the Aerie campaign reported a greater improvement in positive affect than any of the other conditions. The upbeat music combined with Aerie's positive body acceptance message may have contributed to the improved mood of its viewers. Qualitative research has found similar results, noting that the print version of the Aerie Real campaign elicited positive reactions regarding body image, mood, and self-concept (Rodgers, Kruger et al., 2019). Viewers of the Dove video also reported increased positive affect, while the women who viewed the HBO, Victoria's Secret, and control videos reported a decline in positive affect. While both the Dove and HBO videos discussed the negative implications of weight bias, Dove's inclusion of women's views taking a stand against weight-based discrimination may have elicited a more positive affect than HBO's personal accounts of the hurtful impacts of weight bias. Perhaps the balance of education and empowerment prevented the Dove video from reducing positive affect unlike the HBO video, which increased the saliency of the negative weight stigma implications. The decrease in positive affect after viewing the Victoria's Secret video is noteworthy for the effects of the thin-ideal, and the control group's decrease in positive affect may have been due to the monotonous nature of the video.

The HBO video was the only one not found to be associated with reductions in negative affect. This may be because its presentation of the harmful consequences of weight stigma may have been upsetting to viewers and elicited negative emotions. While it may seem unusual that Victoria's Secret and control simultaneously reduced both positive and negative affect, research has demonstrated that positive and negative affect are two independent constructs and are not necessarily correlated (Watson & Tellegen, 1985). An alternate explanation is the Control and Victoria's Secret videos may have distracted from participants' negative affect in other areas of their lives.

4.1. Limitations

While the current study contributes to the growing literature on media's influences on psychological well-being, several limitations about the sample's demographics are worth noting. The sample was two-thirds white, mostly normal weight, and drawn from a pool of undergraduate students enrolled in the introduction to psychology course at a large southeastern university, which limits the findings' generalization to older, larger-bodied, more ethnically diverse, and less educated women. Weight discrimination is experienced more by persons that are younger and larger-bodied (Puhl et al., 2008) and the thin ideal is internalized differently by women of different races and ethnicities (Fujioka, Ryan, Agle, Legaspi, & Toohey, 2009; Powell & Kahn, 1995; Rakhkovskaya & Warren, 2014; Warren, Gleaves, Cepeda-Benito, Fernandez, & Rodriguez-Ruiz, 2005). Ethnic minorities may reject the Western thin ideals and be less likely to internalize body standards aimed toward white women (Fujioka et al., 2009; Rakhkovskaya & Warren, 2014; Warren et al., 2005). A more racially and ethnically diverse sample may respond differently to advertising campaigns promoting or demoting the thin ideal. It is also important to note the ethnic representations in the video clips themselves. While Aerie and Dove included a more ethnically diverse selection of models, they were still predominantly white. It would be important for future campaigns to include more ethnically diverse models and future research to examine the effects on constructs such as body image, IWB, and self-esteem, in a more diverse sample.

The exclusively female sample limits the study's potential generalizability to men, who are likely more passive consumers of women's advertising and whose responses to the Aerie and Dove campaigns are likely to be quite different than women's (Barlett, Vowels, & Saucier, 2008). However, Baker and Blanchard (2017) found that female thin ideal media activated men's appearance schema, so the effects of these campaigns may not be completely irrelevant to the male population. Further, men also experience media pressures to conform to a muscular ideal male body type (Barlett et al., 2008). Future research may consider examining the effects of media targeting male and female audiences on a sample including men.

Another limitation is the study's focus on proximal reactions as opposed to long-held beliefs and attitudes. Weight bias, IWB, and body image are formed by beliefs about oneself, others, and weight as related to a one's value and characteristics, which develop at a young age (Bissell & Hays, 2010; Paxton & Damiano, 2017) and are shaped throughout one's lifetime, in part, through exposure to media (Martin, 2010). For instance, children's cartoon television shows portray underweight and normal weight characters as attractive and overweight characters as unattractive (Klein & Shiffman, 2006). Preadolescents use the media for information about appearance ideals, resulting in peer appearance criticism and poor body image (Rousseau, Trekels, & Eggermont, 2018). Views of weight and body image are influenced by other sociocultural factors, too, such as family and romantic partners, that were beyond the scope of this study (Huxley, Halliwell, & Clarke, 2015; Rodgers, Wertheim, Damiano, & Paxton, 2019). Participant reactions to the videos (e.g., "the video made me feel...") revealed improved weight-based attitudes immediately following the videos, but we did not assess for long-term effects on the participants' beliefs. The videos did not affect global measures assessing more stable and enduring beliefs and attitudes that develop over years of exposure. Additionally, the video-specific phrasing of the video reaction items may have made these proximal attitudes more susceptible to demand characteristics and of limited relevance to the control group.

Additionally, while the study was advertised vaguely as assessing reactions to media, the baseline assessment of weight-

related variables may have shaped participants' ideas about the researchers' true interests. Similarly, completing questionnaires about weight bias and IWB prior to watching the video may have primed participants to think about these issues prior to the intervention, thereby influencing the effect of the video clip (i.e., instrument reactivity; Allen, 2017). We made an effort to reduce priming effects by showing the video clip one week after completing the baseline assessment of these constructs, but it is unlikely this completely eliminated this concern.

4.2. Future directions and current study implications

Future research may consider implementing an increased dose of exposure to the campaigns, because of the null findings for body image, weight bias, and IWB. The necessity of repeated exposure to television advertisements in order to persuade viewers has been a topic of discussion and research for decades (Krugman, 1965). While it would have been impressive if a single dose of a brief advertising campaign produced significant changes on long-standing beliefs, expectations for such change were probably unrealistic. Previous studies have successfully manipulated weight bias with 17-minute (Burmeister et al., 2017) and 40-minute (Domoff et al., 2012) videos. While advertising campaigns are typically much shorter, multiple campaigns from the same company could be combined, the same campaign could be shown repeatedly, or multiple campaigns with similar messages could be combined in the same condition (e.g., showing both the Aerie and Dove campaigns to the same group of participants). Regarding the latter idea, guided by the recommendations for message selection outlined by Slater, Peter, and Valkenburg (2015), we suggest future studies define and operationalize heterogeneous message variables and consider content analyses for inherently complex messages.

Furthermore, cultivation theory (Kosut, 2014; Shanahan, Signorielli, & Morgan, 2014) supports the notion that a higher dose of exposure to body-positive media would be required for viewers to accept the new body standards and develop progressive attitudes toward diverse body weights and shapes (Gerbner, Gross, & Morgan, 2002). While the current findings suggest that a single brief exposure did not have an impact on body image and replication is warranted, the significant differences between conditions on how the videos made the participants feel about themselves and their bodies is encouraging and suggests exposure to a positive advertising campaign over a longer period of time, such as a lifetime, may indeed have a positive impact on body image. These findings are consistent with preliminary research on the Aerie and Dove campaigns suggesting they impact mood (Kraus & Myrick, 2018), body-focused anxiety (Anschutz et al., 2009), and body satisfaction (Convertino et al., 2016).

The study's findings have implications for a broader impact on society. If advertising campaigns in print, television, and social media continue in the direction of body positivity and inclusivity, then over time we may see these inherent brief, repetitive exposures as a mechanism for long-term change. While the notion of creating weight bias reduction interventions is relatively novel, research on interventions targeting body image has existed for some time (Posavac, Posavac, & Weigel, 2001; Slatkoff, 1999; Veldhuis, Konijn, & Knobloch-Westerwick, 2017). The current work may also be considered encouraging for the continued development of positive body image interventions via social media (Cohen & Blaszczynski, 2015; Dumas & Desroches, 2019; Lydecker et al., 2016; Santarossa, 2015) and a catalyst for weight bias reduction interventions on social media platforms. This line of research may also facilitate change in business strategy to positively influence body image (Craddock et al., 2019), the development of body image laws (Bromberg, Hay, LLB, & Freitas, 2019), and other research-to-policy translation (Austin, Yu, Tran, & Mayer, 2017) that could

be expanded to weight stigma and weight-based discrimination. Corporations, such as Dove and Aerie, have a wide reach to a large audience and may be able to use their platforms to engender change in beliefs and attitudes. Finally, it would be helpful for future research to specifically explore the impact of different content from various media sources, from educational media to commercial media selling a product to advocacy on social media, and focus subsequent intervention efforts according to whether people perceive and respond to these different forms of media in distinct ways. As future research and potential societal, law, and policy changes will take time to come to fruition, interventions that enhance women's appreciation of their own bodies and reduce thin-ideal internalization may help protect against negative media exposure effects in the meantime (Halliwell, 2013).

5. Conclusion

Advertisements undoubtedly have the power to shape attitudes and beliefs around weight. This investigation highlights that advertisements are not socially neutral but can and do contribute to social norms, discourse, and attitudes in ways that are sometimes intended and other times unintended. Cumulative exposure to media promoting the thin ideal has likely created significant body image disturbances in women for a long time (Grabe, Ward, & Hyde, 2008), and more research is needed to parse out exactly how media affects body dissatisfaction for both women and men (Ferguson, 2013). The exact amount of exposure and time required for campaigns such as Dove and Aerie to create lasting positive change on body ideals and weight bias is uncertain, but the current study demonstrated that even a brief, one-time exposure to an advertising campaign can influence individuals. Viewers in the current study found the Aerie and Dove campaigns to have a positive, uplifting, and empowering message. We found Aerie and Dove campaigns not only improved self-esteem and put viewers in a better mood, but they also made viewers more accepting of diverse body shapes and sizes. Given that there are myriad negative influences in media perpetuating society's unrealistic thin ideal for women (Martin, 2010), the Aerie Real and Dove Real Beauty campaigns are promising steps toward presenting a positive, accepting message around women's bodies and counteracting weight stigma for women.

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Jennifer C. Selensky: Conceptualization, Formal analysis, Investigation, Methodology, Visualization, Writing - original draft, Writing - review & editing. **Robert A. Carels:** Conceptualization, Methodology, Writing - review & editing.

Declaration of Competing Interest

The authors report no declarations of interest.

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