

WEIGHT STIGMA AND MEDIA: AN EXAMINATION OF THE EFFECT OF
ADVERTISING CAMPAIGNS ON WEIGHT STIGMA, INTERNALIZED WEIGHT BIAS,
BODY IMAGE, SELF-ESTEEM, AND AFFECT

by

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July, 2019

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The terms weight stigma and weight bias have been used interchangeably to refer to the negative beliefs, attitudes, and stereotypes about someone due to their weight status, and these beliefs may be internalized when directed toward the self. Weight bias and internalized weight bias (IWB) have significant negative social, physical, and mental health consequences, which have prompted the call for weight bias reduction interventions. The media is a significant perpetrator of weight stigma, but recent Aerie and Dove campaigns have been making an effort to promote body acceptance and deemphasize the thin ideal. The current study's objectives were to 1) examine the influence of these campaigns on changes in weight bias and IWB in order to evaluate their potential as tools for weight bias and IWB reduction, and 2) measure the campaigns' effects on body image, self-esteem, and affect to determine whether they have their intended positive effect on their targeted female audience. While global measures of weight bias and IWB were unchanged by the campaigns, specific reactions to the videos showed promise for the positive effects of the Aerie Real and Dove Real Beauty campaigns on women. Women who viewed these campaigns demonstrated improved self-esteem and increased positive affect. Further, women found the campaigns to have positive, uplifting, and empowering messages.

Future research is needed to replicate the current findings. Additionally, future studies may consider print forms of body positive campaigns or an increased level of exposure to the campaigns in order to see change on more stable constructs such as weight bias, IWB, and body image. The Aerie Real and Dove Real Beauty campaigns positively influenced self-esteem and mood and are potential tools for weight bias reduction with further study. The current study should be considered a catalyst for a “fresh wave” of research on real-world interventions that may improve anti-fat attitudes in our society.

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A Dissertation Defense

Presented to the Faculty of the Department of Psychology

East Carolina University

In Partial Fulfillment of the Requirements for the Degree

Doctor of Philosophy in Health Psychology

by

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July, 2019

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Chapter I: Introduction

Obesity is a significant health problem in the United States due to the increased risks for disease and subsequently high healthcare costs. Over one-third (34.9%) of the adult population is obese (BMI ≥ 30), and over two-thirds (68.5%) are overweight (BMI > 25 ; Ogden, Carroll, Kit, & Flegal, 2014). Obesity contributes to diseases such as cardiovascular disease, atherosclerosis, type 2 diabetes, hypertension, and cancer (NHLBI, 2013). As a result of the rising prevalence rates of these adiposity-related diseases, healthcare costs have increased from \$78.5 billion in 1998 to \$147 billion in 2008 (Finkelstein, Trogon, Cohen, & Dietz, 2009). Weight status is a complex biopsychosocial phenomenon (Perri & Corsica, 2002; Pi-Sunyer, 1996; DPP, 2002; Wadden, 2006), which may be further complicated by weight stigma (Carels et al., 2009; Carels, Rossi, Solar, & Selensky, 2017; Puhl & Brownell, 2006; Wott & Carels, 2010).

Weight stigma and bias refer to the negative beliefs, attitudes, and stereotypes about someone due to their weight status (most often obesity but also excessively low weight) and are manifested in myriad ways. Common stereotypes include that persons with overweight and obesity are lazy, unintelligent, unattractive, and lack willpower (Puhl, Moss-Racusin, & Schwartz, 2007). The manifestation of these stereotypes results in discrimination in every area of life, including employment, healthcare, education, and relationships (Puhl & Brownell, 2001; Puhl & Heuer, 2009). Furthermore, weight stigma may be internalized when an individual holds negative beliefs, attitudes, and stereotypes toward themselves (Durso & Latner, 2008).

Despite the majority of the population having overweight or obesity, stigmatizing individuals who are obese has become a normative and acceptable practice in our society. The rate of discrimination by weight has steadily increased over the years and is nearly as prevalent

as race and age discrimination (Andreyeva, Puhl, & Brownell, 2008; Puhl, Andreyeva, & Brownell, 2008). In fact, 40% of individuals with a BMI > 35 kg/m² endorsed facing weight-stigmatizing situations (Puhl, Andreyeva, & Brownell, 2008). Significantly, women reported double the frequency of weight-based discrimination than men, likely due to the Western thin ideal that targets women but not men (Puhl, Andreyeva, & Brownell, 2008). Weight bias has been found to be stronger than other forms of bias, such as “Muslim bias” and “gay bias.” In most stigmatized groups, the in-group members typically oppose and challenge the negative stereotypes, but with overweight and obesity, both members of the out-group (i.e., persons without overweight and obesity) and the in-group (i.e., persons with overweight and obesity) endorse negative weight bias attitudes about the in-group members (Latner, O'Brien, Durso, Brinkman, & MacDonald, 2008).

As noted above, individuals with overweight and obesity not only experience the negative physical health consequences of excess bodyfat, but they also experience the negative physical, psychological, and social consequences of weight stigma. In response to the significant biopsychosocial burden associated with obesity and weight stigma, the development of approaches to reducing weight bias is an emerging field. Various intervention types have demonstrated a small positive effect on reducing weight bias and new effective approaches to reducing stigma are greatly needed (Lee, Ata, & Brannick, 2014). One commonly identified perpetrator of weight stigma is the media. The media is replete with negative portrayals of individuals with overweight and obesity and the promotion of a “thin ideal” body type (Ata & Thompson, 2010). Media influences of weight stigma begin at a young age, with children’s cartoon shows portraying underweight and normal weight characters as attractive and overweight characters as unattractive (Klein & Shiffman, 2006). While the media contributes to weight

stigma and associated constructs of the internalization of weight bias (i.e., mood, body image, self-esteem, and eating behaviors), the relationship between media exposure and internalized weight bias (IWB) has yet to be directly examined (Durso & Latner, 2008; Groesz, Levine, & Murmen, 2002; Pearl, 2018).

Recent campaigns have been making an effort to change social consensus about weight stigma through the promotion of body acceptance and deemphasis of the thin ideal. These efforts have been made by indicating that images have not been retouched, such as with the AerieReal campaign, and highlighting the harmful effects of female beauty standards as with the Dove RealBeauty campaign. Despite their positive message, the AerieReal advertisements have been criticized for lacking models with diversity in size and appearance (e.g., Bouma-Prediger, 2017; Karanović, 2014). Additionally, empirical research is needed to determine whether the Aerie and Dove campaigns promote positive body image as purported and whether they influence weight stigma or IWB.

Research examining the relationships between media and weight stigma thus far have focused on the stigmatizing content and the ability for images and text in media to alter views on individuals with overweight and obesity. No study to date has been conducted on the impact of advertising campaigns on weight stigma, IWB, and related correlates such as body image and self-esteem. The widespread reach of media and the known gravity of the negative consequences of weight stigma support the significance of the current investigation. Further, knowledge of the influence of such campaigns is important for informing companies about the potential positive or detrimental effects of their advertising efforts.

The current study aims to answer the questions of: do the Aerie and Dove campaigns reduce weight bias and internalized weight bias? Do they promote positive body image and self-

esteem as intended? To aid in answering these questions, the current investigation will also compare the outcomes for these two campaigns with that of the pro thin-ideal promotion in a Victoria's Secret advertisement. These two campaigns will also be compared to an educational approach to reducing weight stigma taken from the HBO documentary "Weight of the Nation" (Hoffman & Chaykin, 2012). It has been argued elsewhere that Victoria's Secret campaigns idolize thin women, thereby perpetuating weight stigma through the promotion of the thin-ideal and contributing to low self-esteem and poor body image among the majority of women who do not fulfill the thin ideal (Chrisler, Fung, Lopez, & Gorman, 2013; Heinberg & Thompson, 1995). A Victoria's Secret advertisement will be included to compare the effects of the supposedly more positive Aerie and Dove advertisements. As a contrast to Victoria's Secret, the weight stigma portion of the HBO documentary has evidence as an effective approach to reduce weight bias through media (Burmeister, Taylor, Kiefner-Burmeister, Borushok, & Carels, 2017). The effectiveness of the Dove and Aerie campaigns to reduce weight bias will be compared to an established weight bias reduction video. The current study proposes to advance the field of weight bias reduction interventions, evaluate the potential for reducing IWB, and gather empirical information on the true effects of these advertising campaigns.

Weight Stigma

The concept of stigma originated with the Greeks who defined it as "bodily signs designed to expose something unusual and bad about the moral status of the signifier" (Goffman, 1963). In contemporary society, stigma is typically recognized as a phenomenon that affects minorities and traditionally less powerful groups in society based on characteristics such as race, ability status, and sexual orientation (Hatzenbuehler, Phelan, & Link, 2013). Stigma involves negative stereotypes and discrimination against a particular group (Link & Phelan, 2001) and has

significant negative consequences on affected individuals' physical health, mental health, relationships, and employment (Hatzenbuehler et al., 2013; Link & Phelan, 2001).

While discrimination based on characteristics such as race and gender reflect more prototypical models of stigma, another frequently reported form of discrimination among adults is weight-based discrimination (Puhl, Andreyeva, & Brown, 2008). Weight stigma is considered to comprise the three constructs of prejudice, stereotyping, and discrimination (Lee, Ata, & Brannick, 2014). Lee and colleagues (2014) defined these terms in the context of weight stigma: prejudice refers to the negative attitudes toward individuals with overweight, stereotyping refers to the beliefs about the group members, and discrimination refers to the unfair treatment of heavier individuals. Members of a stigmatized group may also internalize the negative bias, particularly when there is a lack of in-group identity. An example of this phenomenon is called internalized weight bias (IWB). Internalized weight bias is evident when individuals with overweight direct weight bias toward themselves (Durso & Latner, 2008). This may come in the forms of believing the negative stereotypes about individuals with overweight to be true about themselves, holding a negative attitude toward themselves due to their weight status, negative mood relating to weight status, expecting rejection from others due to overweight status, and measuring one's personal value and self-esteem based on overweight status (Durso & Latner, 2008).

Some individuals are more likely to experience or report experiencing weight stigma than others. For example, women and younger persons report more weight discrimination than men and older persons, which may reflect disparate bodyweight standards based on gender and age (i.e., the thin ideal imposed on women in Western culture; Hunger & Major, 2015; Puhl et al., 2008;). In fact, a recent meta-analysis estimated that a disproportionate number of U.S. women

(20-45%) relative to U.S. men (6-8%) with obesity reported experiencing weight discrimination, with the range of percentages reflecting the range of obesity severity (Spahlholz, Baer, König, Riedel-Heller, & Luck-Sikorski, 2016).

Manifestation of Weight Stigma

Weight stigma manifests in many forms, including interpersonal bias expressed through attitudes, judgments, aggression, and teasing, and structural barriers, such as public seating that is too narrow (Wott & Carels, 2010; Puhl, Moss-Racusin, Schwartz, & Brownell, 2007b). Common stereotypes about individuals with overweight and obesity are that they are lazy, overeaters/binge-eaters, unintelligent, unattractive/ugly/disheveled, worthless, jolly/happy, have poor hygiene, have an emotional/psychological deficit, lack willpower/self-discipline, and eat junk food/unhealthy foods (Puhl, Moss-Racusin, & Schwartz, 2007a). In media sources, such as the news, advertisements, and entertainment, individuals with overweight and obesity are often portrayed negatively as lazy, unmotivated, inactive, and consuming unhealthy foods, and are the target for humor (Puhl & Heuer, 2009). It is a common misconception that weight stigma motivates people to lose weight, as if weight stigma provides an “incentive” to lose weight (Puhl & Heuer, 2010). In reality, these hurtful stereotypes have serious negative consequences for individuals with overweight and obesity in many domains of life.

Overweight and obese individuals report experiencing stigmatizing situations in a wide range of environments (i.e., home, school, work, public places, and healthcare settings) and from many different people (i.e., friends, spouses, family members, children, classmates, coworkers, sales clerks, strangers, and doctors) in the forms of negative assumptions and attitudes, physical barriers, social exclusion, and hurtful comments (Ashmore, Friedman, Reichmann, & Musante,

2008; Brownell, Puhl, Schwartz, & Rudd, 2005; Puhl & Brownell, 2001; Puhl & Brownell, 2006; Puhl & Heuer, 2009; Puhl et al., 2007b).

For example, healthcare providers were reported as a source of insensitive weight-related comments and as spending less time providing health education to patients with overweight and obesity (Bertakis & Azari, 2005; Brownell et al., 2005; Poustchi, Saks, Piasecki, Hahn, & Ferrante, 2013). This may, in turn, affect the patients' comfort level with seeking medical care. Weight-based discrimination in employment settings results in unfair hiring, promotion, salary, and firing decisions (Maranto & Stenoien, 2000; O'Brien et al., 2008). While more research is needed to clarify the relationship between weight and educational opportunities, current literature suggests disadvantages in educational achievement due to obesity, especially for female students (Crosnoe, 2007). Burmeister and colleagues (2013) provided evidence for weight bias in graduate school admissions as BMI inversely predicted admission for applicants with overweight and obesity who interviewed face-to-face while there was no discriminatory effect on admissions for such applicants who did not have face-to-face interviews. These results would suggest that the knowledge of weight status negatively influenced graduate school admission decisions.

Women also suffer more than men from weight-based discrimination in dating relationships. Overweight women in an undergraduate sample were less likely to be dating than their normal weight counterparts (Sheets & Ajmere, 2005). Both men and women in another collegiate sample rated individuals with obesity as less desirable sexual partners than a partner with a physical disability, mental illness, or a history of sexually transmitted diseases (Chen & Brown, 2005). In fact, weight bias appears to persist in a dating and mate value context for those who were formerly obese. In one study examining former obesity status and weight loss method (i.e., diet and exercise, bariatric surgery, or diet pills), thin women who were previously

overweight were viewed as a less desirable romantic partner regardless of weight loss method while men who were previously overweight were only viewed by women as a less desirable partner if they used diet pills or underwent bariatric surgery (Carels, Rossi, Solar, & Selensky, 2017a). Taken together, these examples reveal how persons with overweight and obesity are affected by weight-based discrimination in romantic relationships, in addition to the areas of healthcare, employment, and education.

Internalized Weight Bias

Weight stigma has been described as the last acceptable form of discrimination for nearly two decades (Puhl & Brownell, 2001). Considering the prototypical, or expected, ways that prejudice and stigmatized groups behave, persons with overweight and obesity behave differently than other stigmatized groups. First, prejudice is considered to be prototypical when the perpetrator is a member of a group of historical power (Inman, Huerta, & Oh, 1998). However, with weight stigma, the “more powerful” individuals without overweight and obesity are not the only ones perpetrating weight stigma; the “less powerful” individuals with overweight and obesity also perpetuate weight stigma by directing it toward themselves and other group members (Durso & Latner, 2008). Second, social identity theory posits that members of a group often hold more positive beliefs about ingroup members than outgroup members, which generates in-group solidarity and minimizes the devaluation of the stigmatized group (Tajfel, 1974). However, with weight stigma this is not true; the overweight “in-group” members often endorse weight stigma beliefs and even believe these stereotypes to be true about themselves (i.e., IWB; Durso & Latner, 2008). Overweight individuals evidence explicit weight bias, implicit weight bias, IWB, and a preference for the outgroup (i.e., thin) members (Wang, Brownell, & Wadden, 2004).

A possible explanation for the perpetuation of weight stigma among both out-group and in-group members and the associated internalization of negative beliefs among individuals with overweight and obesity is the controllability of weight, or the idea that weight is a personal responsibility that is controlled on an individual level through behavioral factors, such as diet and exercise (Blaine, DiBlasi, & Connor, 2002; Carels & Musher-Eizenman, 2010; Tiggemann & Anesbury, 2000). The belief that weight is controllable places a personal blame on the overweight individual for their weight status. Further, not only does the idea that weight is within someone's control make overweight distinct from an unchangeable characteristic (i.e., race) from an out-group perspective, but this also may lead in-group members to view their overweight group membership as temporary and malleable. This perspective on weight-based group membership likely weakens the in-group mindset, leading to a lack of the solidarity seen more commonly in other stigmatized groups (i.e., race, gender, religion; Rudman, Feinberg, & Fairchild, 2002). This idea that individuals with overweight do not see themselves as a permanent member of the overweight "in-group" helps to explain why overweight individuals have a preference for "out-group" thin members, and thereby endorse negative stereotypes about overweight people and direct weight bias toward themselves (IWB).

Physical and Mental Health Outcomes

Not only do individuals with overweight and obesity have physical health risks due to excess bodyweight, but they also experience weight stigma and IWB. Weight stigma results in unfair treatment in many life domains, contributes to a diminished quality of life (Puhl & Heur, 2010), and interferes with weight loss (Carels et al., 2009; Wott & Carels, 2010). Physical and psychological correlates of IWB include binge eating, negative mood, low self-esteem, body dissatisfaction, drive for thinness, and avoidance of exercise (Carels et al., 2010; Durso &

Latner, 2008; Pearl, Puhl, & Dovidio, 2015; Vartanian & Novak, 2011). In fact, weight stigma concerns mediate the relationship between greater BMI and worse self-reported health (Hunger & Major, 2015).

Weight stigma and weight-based discrimination contributes to the perpetuation of obesity, weight gain, and subjectively worse physical and mental health. A 4-year longitudinal study demonstrated the causal relationship between weight stigma and obesity (Sutin & Terracciano, 2013). Participants ($N = 6,157$) were classified as either obese or non-obese at baseline. Controlling for demographic variables and BMI at baseline, individuals without obesity at baseline who reported weight discrimination were 2.5 times more likely to have obesity at the 4-year follow-up assessment; individuals with obesity at baseline who reported weight discrimination were 3 times more likely to still have obesity at follow-up. The detrimental consequences of weight stigma were also found in a 10-year longitudinal study on individuals with overweight ($N = 1,841$), demonstrating the causal relationship between weight discrimination and worsened subjective daily physical symptoms (i.e., headache, backache), worsened subjective mental health symptoms (i.e., more negative affect), and an increase in depressive symptoms when controlling for BMI (Sutin, et al., 2016b).

Weight stigma directly affects physical health through healthcare utilization disparities among individuals with obesity. In one study, patients with obesity reported that they expected to be stereotyped based on their weight and were reluctant to discuss weight concerns with medical providers (Brown, Thompson, Tod, & Jones, 2006). In another study, men with a BMI ≥ 40 kg/m² were nearly 20% less likely than their lower weight counterparts to have undergone endoscopic colorectal cancer screenings with a lack of physician recommendation reported as the most frequent barrier (Seibert, Hanchate, Berz, & Schroy, 2017). This is concerning since

obesity is a risk factor for colorectal cancer and, if true, it is not clear why physicians are not making these recommendations to their patients with obesity. Similarly, women with obesity are at a higher risk for gynecological cancers but are more likely to avoid screenings due to a variety of weight stigma concerns, such as feeling embarrassed to be weighed, medical providers' negative attitudes, disrespectful treatment, unsolicited weight loss advice, and medical equipment too small for their size (Amy, Aalborg, Lyons, & Keranen, 2006). These barriers to seeking healthcare were positively correlated with BMI and were reported by patients despite their concerns about cancer.

Health is also affected by weight stigma through maladaptive coping responses to weight stigma and IWB. A two-week ecological momentary assessment study uncovered that weight-stigmatizing experiences resulted in fewer positive emotions and more negative emotions (Carels, Rossi, Solar, & Selensky, 2017). Further, a number of studies identified overeating, emotional eating, or binge eating behaviors in response to the negative mood and psychological distress produced by weight-stigmatizing situations (Ashmore, Friedman, Reichmann, & Musante, 2008; Puhl & Brownell, 2006; Puhl, Moss-Racusin, Schwartz, & Brownell, 2007; Sutin et al., 2016a). A model has been proposed to explain the relationship between stigmatizing events, maladaptive eating behaviors, and higher BMI. The cyclic obesity/weight-based stigma (COBWEBS) model suggests that stress promotes the cyclical nature of weight stigma (Tomiya, 2014). The model is based on the idea that weight stigma is a stressor and stress leads to weight gain through biological and behavioral mechanisms; stress promotes the secretion of the fat-storage-promoting hormone cortisol, weakens self-regulation ability, and drives increased eating behaviors as a coping method. The subsequent weight gain maintains an

individual's overweight status, thereby maintaining their susceptibility to weight stigma and perpetuating the cycle of the COBWEBS model (Tomiyama, 2014).

The cycle of stress, maladaptive coping (i.e., binge/emotional eating), and weight gain, described in the COBWEBS model explains how weight stigma increases obesity risk and interferes with weight loss treatment. In addition, individuals who internalize weight stigma are more likely to engage in adverse health behaviors, such as binge eating, increased food consumption, and decreased physical activity motivation and engagement, and are more likely to be obese or gain weight (Puhl & Suh, 2015). In a separate but similar study, women ($M_{\text{BMI}} = 37.66 \text{ kg/m}^2$, $SD = 9.47 \text{ kg/m}^2$) with high internalized weight bias reported more binge-eating episodes and fewer weight loss behaviors (i.e., dieting; Puhl, Moss-Racusin, & Schwartz, 2007).

In experimental research, women with or without overweight were exposed to a news article with either a weight stigmatizing or control message (Major, Hunger, Bunyan, & Miller, 2014). Interestingly, women with overweight responded to the weight stigmatizing message by consuming more calories and reported lowered perceived dietary control. Conversely, the stigmatizing message did not drive the women without overweight to consume more calories and they reported increased perceived dietary control.

Finally, in a treatment-seeking sample of overweight and obese individuals enrolled in a 14-week behavioral weight loss program, more weight stigmatizing experiences (Wott & Carels, 2010) and a higher degree of IWB (Carels et al., 2010) were correlated with greater caloric consumption, less physical activity, less weight lost in the program, a higher frequency of binge eating, more depressive symptoms, and worse appearance evaluation. In addition to overeating, binge-eating, and poor weight loss outcomes, individuals who experience weight discrimination

report greater irregular meal times and consuming more convenience (i.e., “fast”) foods, even when controlling for BMI (Sutin, Robinson, Daly, & Terracciano, 2016a).

Weight stigma and IWB are also related to psychological correlates, such as increased symptoms of depression, low self-esteem, poor body image, more negative affect, less positive affect, and lower quality of life (Pearl & Puhl, 2016; Puhl & Heur, 2009). In a presurgical sample of bariatric-seeking patients, depressive symptoms were positively correlated with IWB, and greater IWB was correlated with less weight lost 12 months after the surgery (Lent et al., 2014). Developers of the Weight Bias Internalization Scale (WBIS) found scores on the scale to be inversely correlated with self-esteem and positively correlated with drive for thinness and body image concern while controlling for BMI among a sample of men and women with BMI > 25 kg/m² (Durso & Latner, 2008). Higher scores on the WBIS among a behavioral weight loss treatment sample were also associated with higher body image concern, anti-fat attitudes, depressive symptoms, and stress, and with lower self-esteem (Durso, Latner, & Ciao, 2016). Lillis, Levin, and Hayes (2011) found that internalized weight bias and coping through experiential avoidance helped to explain the inverse relationship between BMI and health related quality of life (HRQL) in a community sample of 87 weight loss seeking participants (89% female, 91% Caucasian, $M_{\text{BMI}} = 33.05 \text{ kg/m}^2$). Given the negative physical and psychological health consequences of weight stigma and IWB, it is unsurprising that researchers have begun to address these issues by exploring approaches to reduce weight stigma and attitudes of weight bias.

Extant Weight Bias Reduction Interventions

Due to the harmful effects of weight stigma and internalized weight bias on physical health, mental health, and quality of life, interventions to reduce weight bias have emerged.

However, relative to the extensive literature on the presence and consequences of weight stigma, intervention research has been more limited (Puhl & Heuer, 2009). Nevertheless, a meta-analysis of 30 studies across 29 articles examined the effectiveness of several different types of approaches to reducing weight bias (Lee, Ata, & Brannick, 2014). Three main types of intervention categories emerged: controllability, empathy, and social consensus.

A controllability intervention targets beliefs about the cause of obesity by providing education about the roles of genetics and environmental factors in an effort to reduce personal blame for weight status (e.g., Diedrichs & Barlow, 2011). For example, a study examining the effect of a controllability intervention on changing different aspects of weight bias (overall attitudes, controllability beliefs, unattractiveness, and social disparagement) in a sample of Australian pre-service health students showed improvements in all aspects of weight bias except social disparagement, which remained unchanged (Diedrichs & Barlow, 2011). Despite some limited success, the attribution theory-based (Heider, 1958) controllability approach has had mixed success with reducing weight bias and changing attitudes toward overweight and obese individuals (i.e., Crandall, 1994; O'Brien, Puhl, Latner, Mir, & Hunter, 2010; Puhl, Schwartz, and Brownell, 2005; Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003).

The next type of intervention uses empathy to increase the acceptance and likeability of individuals with obesity. One study demonstrated that reading a women's personal narrative about the contributors of her weight status and the difficulties of being overweight increased positive feelings about obese individuals (Grosko, 2010). Nostalgia has been shown to foster social support and connectedness (Wildschut, Sedikides, Routledge, Arndt, & Cordaro, 2010). Therefore, consistent with the approach to increase attitudes of acceptance and likeability, nostalgia has also been used as an intervention tool for reducing weight bias. While controlling

for mood, positiveness of the memory, and prototypicality of the person recalled, when participants were asked to recall a nostalgic (vs. ordinary) event involving an overweight person, participants reported subsequently improved cognitive, affective, and behavioral attitudes toward overweight individuals in general (Turner, Wildschut, & Sedikides, 2012). Similarly, having a close relationship with an overweight person is associated with lower anti-fat attitudes (Geier, Schwartz, & Brownell, 2003).

The final main type of weight bias reduction intervention uses social consensus. One study asked participants to rate the percentage of individuals with obesity who possess a list of 10 negative and 10 positive traits (Puhl et al., 2005). One week later, participants were provided with feedback; they were told that their peers rated individuals with obesity either more or less favorably than they did and then were asked to rate the traits again. Participants who were told others reported more positive traits responded with more favorable trait ratings the second time, which suggests that whether one perceives others to be accepting or disparaging toward overweight individuals is influential on their own weight stigma beliefs.

Overall, the meta-analysis found no significant difference between intervention type and attitude change; they generally produced a small, positive effect on weight bias attitudes and beliefs (Lee et al., 2014). It is possible that simply making one's weight biases salient, regardless of the method, is helpful in changing beliefs and attitudes. However, this awareness and reflection is likely a rare natural daily occurrence. Lee and colleagues (2014) concluded that weight bias, like obesity, is a complex construct that does not have a simple solution and suggested researchers be encouraged by the positive impact of the existing interventions to develop novel approaches in this "fresh wave" of research.

Weight Bias and the Media

Due to the apparent limited effect of the extant weight bias reduction interventions, it is important to consider what other factors, beyond education, empathy, and social consensus, contribute to the perpetuation of individuals' weight biases. The media is a significant source of weight stigma in our society, as it promotes the denigration of persons with overweight and obesity and the thin ideal. Television and movies perpetuate weight stigma through the underrepresentation and stigmatization (i.e., humor, negative representation) of overweight characters and the overrepresentation and idealization of thin characters (Himes & Thompson, 2007). The overrepresentation of thin female characters and positive verbal reinforcements for having a thin figure have been seen in situation comedies for decades (Fouts & Burggraf, 1999).

Similarly, the news media is a consistent avenue for shaping societal beliefs and attitudes, and there is mounting evidence of its influence on weight stigma and bias through the way it frames obesity as a problem of personal responsibility (Bonfiglioli, Smith, King, Chapman, & Holding, 2007; Kim & Anne Willis, 2007; Lawrence, 2004). A relevant experimental study examined the influence of news stories about obesity accompanied with or without positive or negative images of obese individuals on anti-fat attitudes (McClure, Puhl, & Heuer, 2011). All participants read a neutral news article about the prevalence of obesity and viewed either a negative image (stereotypical or unflattering) or a positive image (nonstereotypical or flattering) image of an obese Caucasian woman. Participants in the negative image group reported greater anti-fat attitudes than participants in the positive image group, which supports the notion that media images influence weight bias. While stereotypical images of individuals with overweight and obesity have declined between 2004 to 2009 (e.g., an 11% decrease in images of persons with overweight eating and a 7% increase in images of them exercising) in news magazines (i.e.,

Times, Newsweek), there is still significant room for improvement (Gollust, Eboh, & Barry, 2012).

There are also often stigmatizing images in public health campaigns intended to prevent or reduce obesity; placing blame and responsibility on persons with obesity is an ineffective tactic and perpetuates weight bias attitudes (Young, Subramanian, & Hinnant, 2016). For example, leading obesity public health campaigns have been criticized for including weight stigmatizing content as it actually results in decreased self-efficacy and motivation to make positive health behavior changes (Puhl, Luedicke, & Peterson, 2013a; Puhl, Peterson, & Luedicke, 2013b). Similarly, weight loss advertisements often have a stigmatizing effect. For example, viewing “before and after” diet advertisements increases the perception of the controllability of weight and, in turn, increases weight bias attitudes (Geier, Schwartz, & Brownell, 2003).

While there is a plethora of literature describing the weight stigmatizing content in the media and its negative impact on weight bias, no studies to date have examined the relationship between exposure to weight stigmatizing media and IWB. In response to viewing weight stigmatizing media content, such as images embodying the thin ideal, psychological constructs of negative mood, poor body image, low self-esteem, and maladaptive eating behaviors have been reported (Durso & Latner, 2008; Groesz, Levine, & Murmen, 2002; Pearl, 2018). Many of these constructs map onto the psychological correlates of IWB, which include poor appearance evaluation, body image concern, drive for thinness, low self-esteem, and depressive symptoms (Carels et al., 2010; Durso & Latner, 2008; Lent et al., 2014; Pearl & Puhl, 2016). Having these psychological correlates in common suggests the possibility that exposure to weight stigmatizing media content may affect IWB and warrants the exploration of this relationship.

While the media contributes to weight stigma and bias, the argument that media provides what the consumer demands is not true (Pearl, 2018). Contrary to the majority of current media content, there is a viewer preference for non-stigmatizing and positive portrayal of overweight persons and a demand for a greater body diversity in media (Pearl, Puhl, & Brownell, 2012; Puhl, Himmelstein, Gorin, & Suh, 2017; Puhl, Neumark-Sztainer, Austin, Luedicke, & King, 2014). For example, participants who viewed stigmatizing images of persons with obesity reported that the images were insulting and made them angry while participants who viewed positive images of persons with obesity endorsed support for those images (Pearl et al., 2012). Despite its ubiquity and potential impact, few studies have examined the media (i.e., advertising campaigns, documentaries, television shows, the news, etc.) as a tool for reducing rather than perpetuating weight stigma.

In one of the few studies in this area, Burmeister, Taylor, Kiefner-Burmeister, Borushok, and Carels, (2017) examined the impact of a 17-minute segment of the HBO documentary *The Weight of the Nation* on weight bias. 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. This study suggests that media with high productive value may be effective at reducing weight bias (Burmeister et al., 2017).

Current Study

The mainstream media has a strong sociocultural influence on beliefs about and unrealistic standards for appearance, body ideals, and thinness (Jobsky, 2014). Advertising campaigns can play an important role in highlighting an unattainable ideal body type, which

contributes to decreased self-esteem and body image (Martin, 2010). For example, 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 strongly basing their self-esteem on appearance, and a greater concern with others' opinions of them (Strahan et al., 2008). Similarly, as indicated earlier, the mainstream media regularly reinforces the denigration of overweight individuals (e.g., Himes & Thompson, 2007; Lawrence, 2004). Despite references to the promotion of the thin ideal in media as a source of weight bias perpetuation, few studies have actually examined how this portrayal of the thin ideal may actually impact weight bias and IWB (Ata & Thompson, 2010; Himes & Thompson, 2007), nor has research examined how ad campaigns designed to promote a positive body image may impact weight bias and IWB.

Major companies, such as Dove and Aerie, have been making a recent effort to undermine the thin ideal and promote positive body image in their advertising campaigns geared toward women. While advertising media has a long way to go to achieve true inclusion and acceptance of all body shapes and sizes, important brand names are making an effort to bring awareness to the issue. Dove launched its "Campaign for Real Beauty" by Unilever in 2004, which pledged to use average-sized, non-retouched, and diverse women instead of models in their advertisements and aimed to bring awareness to the discriminatory effects of current beauty standards. One of Dove's campaign videos even centered on the issue of weight stigma among women and negative consequences of such stigma. The AerieReal campaign was launched in 2014 and also features non-model women and non-retouched images.

Several studies have evaluated the Dove Real Beauty campaign through a feminist lens (i.e., Murray, 2013; Scott & Cloud, 2008; Taylor, Johnston, & Whitehead, 2016) but not from a

weight stigma perspective. One study examined the emotional responses to “body positive” vs. traditional beauty advertisements using a Dove Real Beauty campaign “sketches” advertisement. One of two body-positive advertisements was viewed by participants and compared with traditional beauty advertisements (Kraus & Myrick, 2018). The body positive advertisements resulted in stronger positive and negative emotions than the traditional advertisements, although the negative emotions were not rated as strongly as the positive emotions. The explanation for the resulting negative emotions is uncertain, but the authors (2018) speculated that perhaps negative emotions, such as guilt, were also elicited in women who do not accept their bodies like the women portrayed in the video. The finding that the campaign elicits stronger positive emotions is nonetheless encouraging of the positive effect the campaign may have on viewers.

To my knowledge, only one research study has been conducted thus far on the AerieReal campaign. A sample of 200 female undergraduate students viewed 30 seconds worth of three different images of either retouched Aerie images (pre-Real campaign) or non-retouched images (post-Real campaign; Convertino, Rodgers, Franko, & Jodoin, 2016). Participants high in appearance comparison had less body dissatisfaction upon viewing the non-retouched campaign images compared to prior Aerie advertising campaigns with digitally altered images. However, there was no difference on body satisfaction among the sample as a whole (Convertino et al., 2016). While the results were modest and preliminary, the findings suggest that progressive body campaigns may be able to decrease the negative effects of the thin ideal that is typically portrayed in media advertisement.

As noted earlier, experiencing weight stigma is associated with lower self-esteem and worse body image (Annis, Cash, & Hrabosky, 2004) and weight-based discrimination is related to lower self-acceptance (Carr & Friedman, 2005). Preliminary research on the negative

influence of the content of advertising media on correlates of IWB, such as body image and self-esteem, has also been documented (Durso & Latner, 2008; Groesz, Levine, & Murmen, 2002; Pearl, 2018). While extant weight bias reduction interventions have focused on contributing factors of controllability beliefs, increasing empathy, and manipulating social consensus, the impact of relevant progressive advertising campaigns on weight bias and IWB and their potential use in the reduction of weight bias and IWB among women has not been examined. The current study aims to explore whether the Aerie and Dove campaigns have a positive effect on weight bias and IWB. Due to the reach of media and advertising to a large audience and its contribution to the perpetuation of weight stigma, the current study has the potential to be more effective and have greater real-world applications than prior weight bias reduction interventions. Further, research is also warranted to determine the campaigns' effectiveness with fulfilling their proposed intentions of having a positive effect on women's self-esteem and body image.

The current study is significant due to the detrimental effects of weight bias and IWB on physical and mental health. Furthermore, there has been a call for the development of novel approaches to weight bias reduction interventions (Lee et al., 2014). A Victoria's Secret advertisement and a clip from the weight stigma portion of the HBO documentary "Weight of the Nation" (Hoffman & Chaykin, 2012) will be used as comparison groups. The Victoria's Secret advertisement was chosen to represent a traditional thin-ideal-promoting advertisement. The HBO documentary was chosen to represent a previously successful, but alternative, media approach to weight bias reduction (Burmeister, 2017). This comparison is important considering the novelty of the current approach.

The current research objectives include: (1) to evaluate the AerieReal and Dove Real Beauty campaigns as methods for reducing weight bias and IWB, and (2) to determine the effects of the Aerie and Dove campaigns on self-esteem and body image.

Hypothesis 1. The participants who view either the AerieReal or Dove Real Beauty advertisements will report a greater reduction of weight bias and IWB than participants who view the HBO documentary clip, the Victoria's Secret advertisement, or are in the control group. The participants who view the HBO documentary clip will report a greater reduction of weight bias and IWB than participants who view the Victoria's Secret advertisement or are in the control group.

Hypothesis 2. The participants who view either the AerieReal or Dove Real Beauty advertisements will report improved self-esteem, body image, and affect from pre- to post-viewing while the participants who view the Victoria's Secret advertisement will report worsened self-esteem, body image, and affect; participants in the HBO documentary clip or are in the control group will report unchanged self-esteem, body image, and affect.

Hypothesis 3. Momentary mood will be explored as a mediator between the experimental condition and weight bias, IWB, self-esteem, and body image. It is hypothesized that positive affect mediates lower weight bias and IWB and higher self-esteem and body image while negative affect mediates higher weight bias and IWB and lower self-esteem and body image.

Chapter II: Methods

Participants

Participants were recruited using the ECU Sona system and compensated through credits (rate of 1 credit per 1 hour of participation). Participants were unable to enroll in the study if they were male or under 18 years of age. There was no exclusion criteria by BMI because research has shown that even non-overweight women perceive weight stigma due to internalization of the thin ideal (Falkner et al., 1999). A prior 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 for the current study was $N = 475$.

Procedure

The current study was conducted entirely online. Eligible participants enrolled in the study by selecting a predetermined enrollment slot online through Sona System. The study was vaguely described as looking at reactions to media. The participants were provided with instructions on the study procedure and were directed to complete the study in a quiet place of their choice without distractions. They were informed that the study required volume on videos or headphones, depending on the setting they chose to complete the study. Upon reading the online informed consent, participants provided electronic consent to participate in the research.

Participants were randomized to one of five groups: Aerie, Dove, Victoria's Secret, HBO, or Denali Control Group. All participants completed the online baseline survey via Qualtrics (Part 1). Approximately one week after completing the baseline survey ($M = 7.71$, $SD = 2.49$ days later), participants were asked to watch a video clip (Part 2). Following the video clip,

participants completed a series of post-intervention questions and measures. Participants in the control group viewed a neutral video clip on Denali National Park while participants in the four experimental groups viewed a media clip intending to manipulate the outcome variables.

Materials

Materials consisted of the five video clips for each of the five conditions. These clips are described in more details below.

#AerieREAL Campaign. The #AerieREAL Campaign presented the video called “The Share Your Spark Experience,” which was described as including “real” women in the campaign to “ignite empowerment and share their positive vibes” (Aerie, 2016). The 2 minute and 32-second-long video portrays women in Aerie undergarments who are happy and confident in their bodies. There is uplifting music in the background with lyrics such as “I love myself.” There is commentary about the development of the campaign from the women who appear in the campaign. For example, an overweight woman in the campaign states, “When I was younger, I never had representation of people that I truly could relate to.” Audio from this clip discusses the message of self-confidence and the importance of loving the person you are on the inside. The link to this video can be found here: <https://www.youtube.com/watch?v=UktgRClp7Bc>

Dove Real Beauty Campaign. The Dove RealBeauty Campaign presented a series of videos bringing to light the stigma and discrimination of various beauty standards, such as “looks,” “age,” and “height. The video titled, “Beauty standards of weight are a form of bias,” is designed to raise awareness of the negative effects of weight stigma among women (Dove US, 2016). The 2-minute video interviews (fully clothed) women 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. In contrast to the Aerie video which has an upbeat

energy intended to promote positive feelings, the Dove video has a more serious tone. The video can be found here: <https://www.youtube.com/watch?v=mZ05C1o9utg>

Victoria's Secret Advertisement. The Victoria's Secret Advertisement titled "Victoria's Secret Dream Angels Commercial 2018" is a stereotypical example of an advertising campaign that promotes weight stigma through the emphasis on the thin ideal (TV Shows, 2018). The two-minute and 29-second video displays very thin women in Victoria's Secret undergarments. The video has upbeat background music but lacks body size diversity. The link to the video is: https://www.youtube.com/watch?v=o_5FAgxX3Fw

HBO Weight of the Nation Documentary. The Stigma segment of Weight of the Nation is 18 minutes and 54 seconds long (Hoffman & Chaykin, 2012). To be consistent with the advertising clips, participants will view a two-minute and 42-second clip from 10:28 to 13:10. This portion was selected because it discusses weight stigma in the media and gender differences. The media segment of this clip discusses the negative portrayals of obese individuals and the "strict ideals for female physical attractiveness in our culture" with commentary provided by Dr. Rebecca Puhl, an expert in the area of weight stigma. Puhl discusses how non-overweight women who do not fit the exact criteria for the thin ideal are vulnerable to stigma while men are not held to such strict ideals. The segment shows interviews with women discussing the hardship of weight stigma, including how it has affected their engagement in romantic relationships. Puhl comments in this section on the disparity between the threshold for weight stigma between men and women. The full Stigma segment was previously used in a successful weight bias reduction intervention (Burmeister et al., 2017). The link to the full Stigma segment can be found here: <https://www.youtube.com/watch?v=4Ow1uiWcn4c>

Denali National Park Documentary. Participants in the control condition will watch a 2 minute and 12 second (from start 0:00 to 2:12) neutral documentary clip describing facts about the Denali National Park and Preserve in Alaska (Sigma Documentaries, 2016). The link to the documentary segment can be found here: https://www.youtube.com/watch?v=gs123AZ8i_k

Measures

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

Video Specific Questions. Participants in all five conditions were asked to respond to video-specific questions to assess their reactions to the videos themselves. One question assessed validity by asking about the content of the video watched with the following possible responses: a Victoria's Secret advertisement, an Aerie campaign advertisement, a Dove campaign advertisement, an HBO documentary clip on weight bias in media, a documentary clip on Denali National Park, unsure, or other. Seven other items assessed participants' reactions to the video on a 5-point Likert scale from "very false" to "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 about the video's message.

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 0 (very strongly disagree) to 9 (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 ($\alpha = .66$).

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. Five items from the original measure were adjusted in the WBIS-M by replacing phrases such as “being overweight” with “my weight.” For example, an item was changed from “I feel anxious about being overweight because of what people might think of me” to “I feel anxious about my weight because of what people might think of me.” Respondents answer using a Likert scale from 1 (strongly disagree) to 7 (strongly agree). Higher scores indicate greater degrees of IWB. The WBIS-M is an 11-item measure demonstrated strong internal consistency ($\alpha = 0.94$) in a sample of a diverse range of bodyweight classifications, from underweight to obese (Pearl & Puhl, 2014). The WBIS-M will be referred to as WBIS throughout the remainder of the document.

Self-Esteem. Self-esteem was measured using the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965; Rosenberg, 1979), which consists of 10 items assessing self-worth and self-esteem on a Likert scale from 1 (strongly disagree) to 4 (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).

Body Image. Body image was measured using the Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman, Whitehead, 2002), which is a 6-item assessment of momentary evaluative and affective body image experiences. Respondents assess how they feel in the moment with items beginning with phrases such as “Right now I feel...” and 9 possible responses ranging from “extremely satisfied” to “extremely dissatisfied with my body size and shape.” Higher scores on the scale indicate better body image. This scale measures body image as a state, rather than a trait, and this is valuable for the current study in examining potential momentary changes in body image following the intervention. 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). In another study, the BISS demonstrated good internal consistency ($\alpha = 0.87$) in a sample of undergraduate women who were exposed to media images of thin and beautiful women (Yamamiya, Cash, Melnyk, Posavac, & Posavac, 2005).

Positive and Negative Affect. Momentary mood 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 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). A higher score on each subscale indicated a higher degree of that affect. The positive affect ($\alpha = 0.89$) and negative affect ($\alpha = 0.85$) subscales demonstrated good internal consistency.

Data Analyses

All data analyses were performed using the Statistical Package for Social Sciences, Version 25. Descriptive and frequency statistical analyses were performed in order to describe

the sample characteristics, such as age, ethnicity, BMI, weight loss history, eating disorder history, and current physical activity routine. One-way between-group 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), engagement in a physical activity routine (yes or no), and the presence of an eating or exercise disorder history (yes or no).

Next, relationships between demographic variables and the outcome variables at baseline were examined. Pearson correlation coefficient was employed to determine differences by age and BMI (continuous variable) on the outcome variables at baseline. A one-way between-groups ANOVA was employed to explore relationships between the outcome variables and BMI categories and between the outcome variables and ethnicity. Independent samples t-tests were conducted to determine differences on baseline variables between participants who endorsed or denied past weight loss attempts, participants who endorsed or denied a history of eating or exercise disorder, and participants who endorsed or denied engaging in a current exercise routine. 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. Finally, exploratory post hoc analyses were performed examining the impact of participant weight category (i.e., underweight, normal, overweight, obese) and ethnicity on these reactions to the videos by condition using univariate general linear model.

Hypothesis 1. The participants who viewed either the AerieReal or Dove Real Beauty advertisements would report a greater reduction of weight bias and IWB than participants who viewed the Victoria's Secret advertisement, HBO documentary clip, or the Denali Control video.

Differences within and between the 5 groups were examined using mixed between-within repeated measure ANOVAs with post hoc comparisons.

Several post-hoc analyses were conducted depending on the outcomes of the repeated measures ANOVAs. First, one-way between-groups ANOVAs were conducted on change in outcome variables between the five groups when there was a significant time x condition interaction to determine where the interaction occurred. Second, paired samples t-tests were conducted to identify significant within-group changes over time. Third, when main effect for condition was significant, LSD post hoc comparisons showed differences between groups.

Hypothesis 2. The participants who viewed either the AerieReal or Dove Real Beauty advertisements would report improved self-esteem, body image, and affect from pre- to post-viewing while the participants who viewed the Victoria's Secret advertisement would report worsened self-esteem, body image, and affect; participants in the HBO documentary clip or control group would report unchanged self-esteem, body image, and affect. As for Hypothesis 1, within and between-subject differences were explored using mixed between-within repeated measure ANOVAs with post hoc comparisons.

Several post-hoc analyses were conducted depending on the outcomes of the repeated measures ANOVAs. First, one-way between-groups ANOVAs were conducted on change in outcome variables between the five groups when there was a significant time*condition interaction to determine where the interaction occurred. Second, paired samples t-tests were conducted to identify significant within-group changes over time. Third, when main effect for condition was significant, LSD post hoc comparisons showed differences between groups.

Hypothesis 3. A mediational model was examined with momentary mood as a mediator between the experimental condition and weight bias, IWB, self-esteem, and body image. It was

hypothesized that the positive affect mediates lower weight bias and IWB and higher self-esteem and body image while negative affect mediates higher weight bias and IWB and lower self-esteem and body image. Prior to running the mediation models, Pearson correlation coefficients were used to determine relationships between change in affect and the outcome variables. Mediation analysis using bias-correcting bootstrapping methodology with the PROCESS macro for SPSS (Hayes, 2018) was used to assess this model.

Chapter III: Results

Demographics

The current study enrolled a total sample of 704 undergraduate psychology students at a large southeastern university at baseline and 506 participants completed the entire study. Parts 1 and 2 were completed approximately one week apart ($M = 7.71$, $SD = 2.49$ days). 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. The sample of 475 participants were randomized at Part 2 to one of five conditions: Victoria's Secret Advertisement ($N = 101$), Control Group/Denali National Park ($N = 92$), AerieReal Advertisement ($N = 97$), HBO Documentary ($N = 88$), or Dove Real Beauty Advertisement ($N = 97$).

The sample was 100% female, $M_{\text{age}} = 18.55$, $SD_{\text{age}} = 1.36$, $M_{\text{BMI}} = 24.89$, $SD_{\text{BMI}} = 6.00$, 4.6% underweight ($N = 22$), 59.2% normal weight ($N = 281$), 20.8% overweight ($N = 99$), and 13.7% obese ($N = 65$). Participants identified as the following: 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 ($N = 314$), 4.0% Other ($N = 19$; Black/Hispanic: $N = 2$, Asian/White: $N = 4$, Biracial/Mixed/Multiracial: $N = 6$, Black/White: $N = 5$, Hispanic/White: $N = 1$, White/Native American: $N = 1$). Regarding weight-related information, 66.9% of participants ($N = 318$) endorsed previous attempts to lose weight or change body shape, 6.5% ($N = 31$) endorsed a history of an eating or exercise disorder, and 54.7% ($N = 260$) endorsed currently engaging in a physical activity routine.

Demographic Differences by Condition. There were no significant differences in demographic or weight-related variables between experimental conditions. One-way between-groups ANOVAs were conducted to examine group differences by age, $F(4, 470) = .56$, $p = .70$,

and BMI, $F(4, 468) = .04, p = 1.00$. Chi-square tests for independence were conducted to examine group differences by BMI category, $\chi(12) = 13.80, p = .31$, ethnicity, $\chi(16) = 11.03, p = .81$, previous weight loss attempts (yes or no), $\chi(4) = 3.52, p = .48$, engagement in a physical activity routine (yes or no), $\chi(4) = 2.77, p = .60$, and the presence of an eating or exercise disorder history (yes or no), $\chi(4) = 2.39, p = .66$. Please reference Table 1 for means and standard deviations or frequency percentages of demographic data within each experimental condition.

Demographic Differences in Baseline Variables. Potential relationships between demographic information and outcome variables were analyzed with Pearson correlation, ANOVA, and independent samples t-test. Pearson correlation coefficient was employed to determine differences by age and BMI on the outcome variables at baseline. Older age was significantly correlated with more negative affect, $r = .09, p = .047$, and lower self-esteem, $r = -.12, p = .01$. In a separate series of correlation analyses, higher BMI was significantly correlated with lower positive affect, $r = -.09, p = .045$, lower self-esteem, $r = -.11, p = .02$, lower body image, $r = -.25, p < .001$, lower dislike weight bias, $r = -.13, p < .01$, lower willpower weight bias subscale, $r = -.10, p = .04$, more fear of fat weight bias, $r = .19, p < .001$, and more internalized weight bias, $r = .49, p < .001$.

A one-way between-groups ANOVA using the Brown-Forsythe test (equal variances not assumed, Levene's Test for Equality of Variances, $p = .049$) showed significant differences between BMI categories on positive affect, $F(3, 214.66) = 3.09, p = .03$. Participants with normal weight, $p = .046$, and overweight, $p = .009$, reported significantly greater positive affect than participants with obesity. See Table 2 for means and standard deviations. A one-way between-groups ANOVA showed significant differences between BMI categories on body

image, $F(3, 463) = 9.92, p < .001$. Participants with obesity reported worse body image than participants of any of the other three BMI categories, $p < .01$. Participants with overweight reported worse body image than participants with normal weight, $p = .03$. A one-way between-groups ANOVA using the Brown-Forsythe test (equal variances not assumed, Levene's Test for Equality of Variances, $p < .001$) showed significant differences between BMI categories on dislike weight bias, $F(3, 63.97) = 4.71, p = .01$. Participants with underweight reported greater dislike weight bias than participants with obesity, $p = .04$. Participants with normal weight reported greater dislike weight bias than participants with overweight, $p = .01$, and obesity, $p = .004$. A one-way between-groups ANOVA showed significant differences between BMI categories on fear of fat weight bias, $F(3, 463) = 6.79, p < .001$. Participants with obesity reported greater fear of fat weight bias than participants with normal weight, $p = .002$, and underweight, $p < .001$. Participants with overweight reported greater fear of fat weight bias than participants with normal weight, $p = .03$, and underweight, $p = .001$. Participants with normal weight reported greater fear of fat weight bias than participants with underweight, $p = .02$. A one-way between-groups ANOVA using the Brown-Forsythe test (equal variances not assumed, Levene's Test for Equality of Variances, $p < .001$) showed significant differences between BMI categories on IWB, $F(3, 463) = 48.83, p < .001$. Participants with obesity endorsed greater IWB than all other weight categories, $p < .001$. Participants with overweight endorsed greater IWB than participants with normal weight and underweight, $p < .001$. Participants with normal weight endorsed greater IWB than participants with underweight, $p = .02$.

A one-way between-groups ANOVA showed significant differences between ethnic identities on self-esteem at baseline, $F(4, 470) = 3.18, p = .01$. Post-hoc analyses revealed that participants who identified as "Black or African American" reported significantly higher self-

esteem than participants who identified as “Hispanic or Latino,” $p = .002$, or “White,” $p = .003$. See Table 2 for means and standard deviations.

Independent samples t-tests were conducted to determine differences on baseline variables between participants who endorsed or denied past weight loss attempts, participants who endorsed or denied a history of eating or exercise disorder, and participants who endorsed or denied engaging in a current exercise routine. See Table 2 for means and standard deviations. Participants who endorsed a history of weight loss attempts reported significantly more negative affect than participants who denied ever trying to lose weight or change body shape, equal variances not assumed (Levene’s Test for Equality of Variances, $p < .001$), $t(393.08) = 3.54, p < .001$. Participants who endorsed a history of weight loss attempts reported significantly lower self-esteem than participants who denied ever trying to lose weight or change body shape, $t(473) = -3.86, p < .001$. Participants who endorsed a history of weight loss attempts reported significantly lower body image than participants who denied ever trying to lose weight or change body shape, equal variances not assumed (Levene’s Test for Equality of Variances, $p = .02$); $t(380.78) = -5.37, p < .001$. Participants who endorsed a history of weight loss attempts reported significantly greater overall weight bias than participants who denied ever trying to lose weight or change body shape, $t(473) = 5.06, p < .001$. Participants who endorsed a history of weight loss attempts reported significantly greater fear of fat weight bias than participants who denied ever trying to lose weight or change body shape, $t(473) = 8.68, p < .001$. Participants who endorsed a history of weight loss attempts reported significantly greater willpower weight bias than participants who denied ever trying to lose weight or change body shape, $t(473) = 2.39, p = .02$. Participants who endorsed a history of weight loss attempts reported significantly greater IWB than participants who denied ever trying to lose weight or change body shape, equal

variances not assumed (Levene's Test for Equality of Variances, $p < .001$), $t(445.66) = 11.13$, $p < .001$. A series of simple linear regressions were conducted and determined that these relationships between weight loss history and baseline variables were still significant after controlling for BMI suggesting that these relationships are not merely secondary to weight status.

Participants who endorsed a history of eating disorder reported significantly greater negative affect than participants who denied a history of eating or exercise disorder, equal variances not assumed (Levene's Test for Equality of Variances, $p = .01$), $t(32.37) = 3.06$, $p = .004$. Participants who endorsed a history of eating or exercise disorder reported significantly lower self-esteem than participants who denied a history of eating or exercise disorder, $t(473) = -5.22$, $p < .001$. Participants who endorsed a history of eating or exercise disorder reported significantly lower body image than participants who denied a history of eating or exercise disorder, $t(473) = -2.90$, $p = .004$. Participants who endorsed a history of eating or exercise disorder reported significantly greater overall weight bias than participants who denied a history of eating or exercise disorder, $t(473) = 2.95$, $p = .003$. Participants who endorsed a history of eating or exercise disorder reported significantly greater fear of fat weight bias than participants who denied a history of eating or exercise disorder, equal variances not assumed (Levene's Test for Equality of Variances, $p = .002$), $t(39.02) = 7.03$, $p < .001$. Participants who endorsed a history of eating or exercise disorder reported significantly greater internalized weight bias than participants who denied a history of eating or exercise disorder, $t(473) = 6.54$, $p < .001$. A series of simple linear regressions were conducted and determined that the relationships between eating disorder history and baseline variables were still significant after controlling for BMI suggesting that these relationships are not merely secondary to weight status. Participants who endorsed currently engaging in a physical activity routine reported significantly greater positive affect than

participants who denied currently engaging in a physical activity routine, $t(473) = 4.26, p < .001$. Participants who endorsed currently engaging in a physical activity routine reported significantly greater overall weight bias than participants who denied currently engaging in a physical activity routine, equal variances not assumed (Levene's Test for Equality of Variances, $p = .004$), $t(472.97) = 4.35, p < .001$. Participants who endorsed currently engaging in a physical activity routine reported significantly greater dislike weight bias than participants who denied currently engaging in a physical activity routine, equal variances not assumed (Levene's Test for Equality of Variances, $p < .001$), $t(461.50) = 2.63, p = .009$. Participants who endorsed currently engaging in a physical activity routine reported significantly greater fear of fat weight bias than participants who denied currently engaging in a physical activity routine, $t(473) = 4.45, p < .001$. Participants who endorsed currently engaging in a physical activity routine reported significantly greater willpower weight bias than participants who denied currently engaging in a physical activity routine, $t(473) = 2.69, p = .007$. A series of simple linear regressions were conducted and determined that these relationships between physical activity and baseline variables were still significant after controlling for BMI suggesting that these relationships are not merely secondary to weight status.

Baseline Correlations

Pearson correlation coefficient analyses were conducted to determine relationships between outcome variables at baseline (see Table 3 for correlation coefficients and levels of statistical significance). Higher overall weight bias (AFA-Total) was significantly correlated with higher dislike weight bias (AFA-Dislike subscale), higher fear of fat weight bias (AFA-Fear subscale), higher willpower weight bias (AFA-Willpower subscale), higher internalized weight bias (WBIS), and higher negative affect (NAS). Higher overall weight bias was significantly

correlated with lower self-esteem (RSES) and worse body image (BISS). Higher AFA-Dislike was significantly correlated with higher AFA-Fear and higher AFA-Willpower. Higher AFA-Fear was significantly correlated with higher AFA-Willpower, higher WBIS, and higher NAS. Higher AFA-Fear was significantly correlated with lower RSES and lower BISS. Higher AFA-Willpower was significantly correlated with higher WBIS. Higher WBIS was significantly correlated with higher NAS. Higher WBIS was significantly correlated with lower RSES, BISS, and positive affect (PAS). Higher RSES was significantly correlated with higher BISS and PAS. Higher RSES was significantly correlated with lower NAS. Higher BISS was significantly correlated with lower NAS.

Specific Video Reaction Questions

In order to capture participants' reactions to their randomly assigned video, they were presented with seven statements and asked to rate how true or false the statements were on a scale from 1 = Very False to 5 = Very True (see Figure 1 for visual display of group differences). See Table 4 for means and standard deviations. A series of one-way between-groups ANOVAs were conducted to determine differences in reactions to the videos for each condition.

There were significant differences between the groups for the statement "The video made me more accepting of diverse body shapes and sizes," $F(4, 470) = 194.47, p < .001$. This statement was endorsed significantly higher for the Aerie, Dove, and HBO groups than for the VS and Control groups, $p < .001$.

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. Therefore, for the next six ANOVAs an asymptotically F distributed was reported using the Brown-Forsythe test. There were significant differences between groups for "The

video made me feel bad about myself or my body,” $F(4, 376.23) = 52.37, p < .001$. Participants in the VS condition agreed with this statement 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 significant differences between groups for “The video made me dislike persons with overweight and obesity,” $F(4, 327.42) = 3.49, p = .009$. Participants who viewed the VS video agreed with this statement significantly more than participants who viewed the Aerie, Dove, or Control videos, $p < .05$.

Responses to “The video had a positive, uplifting, and empowering message,” differed significantly between conditions, $F(4, 367.39) = 191.22, p < .001$. Participants in the Aerie and Dove groups agreed with this statement 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 VS and Control groups, $p < .001$.

Agreement with the statement “The video had a good production quality,” varied significantly between groups, $F(4, 337.79) = 44.25, p < .001$. This statement was agreed with significantly more by the Aerie, Dove, and HBO conditions than for the VS 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 VS group agreed with this statement significantly more than the Control group, $p < .001$.

There were significant differences between groups for “I liked the video,” $F(4, 404.03) = 75.00, p < .001$. Participants in the Control group liked the Denali National Park video significantly less than the VS, Aerie, Dove, and HBO groups liked their respective videos, $p <$

.05. Participants in the Aerie and Dove groups liked their videos significantly more than the participants in the VS and HBO groups liked their videos, $p < .01$. Participants in the HBO group liked their video more than participants in the VS liked their video, $p < .001$.

Responses to “The video was entertaining,” differed significantly between conditions, $F(4, 447.12) = 56.32, p < .001$. Participants in the Control group found their video to be significantly less entertaining than the other four groups, $p < .001$. Participants in the Aerie and Dove groups rated this statement significantly higher than the participants in the VS and HBO groups, $p < .01$. Participants in the HBO group agreed with this statement more than participants in the VS group, $p < .001$.

Finally, exploratory post hoc analyses were performed examining the impact of participant weight category (i.e., underweight, normal, overweight, obese) on these reactions to the videos by condition using univariate general linear model. Weight category had little impact on reaction to the videos except for underweight participants disagreed with the statement, “The video made me feel bad about myself or my body,” slightly more than participants with overweight (mean difference = .57) or obesity (mean difference = .78). Likewise, normal weight participants disagreed with the aforementioned statement more than participants with obesity (mean difference = .38).

Additional exploratory post hoc analyses were performed examining the impact of ethnicity on the video reactions by condition using univariate general linear model. Ethnicity had little impact on reaction to the videos except for Hispanic participants disagreed with the statement, “The video had a good production quality,” significantly more than Asian (mean difference = .84), Black (mean difference = .54), and White (mean difference = .44) participants.

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 (5x2 condition x time interaction). Overall, few of the hypothesized significant interactions of condition by time were observed. Main effects were reported and should be interpreted with caution. For instance, while a significant main effect for time reflects change within a condition after watching the respective video, in the absence of a significant interaction the change is not significantly different from change in other conditions. Nevertheless, to better understand the outcomes, additional post hoc analyses were conducted to explore changes within each condition among the variables of interest regardless of the presence of a statistically significant main effect for time. Paired samples t-tests were employed to explore the possibility of within-group changes. Again, these exploratory findings were post hoc and meaningful interpretation is limited in the absence of a significant interaction effect.

Weight Bias (AFA). There was no significant interaction between condition and time on overall weight bias (AFA-Total) between the 5 different groups, $F(4, 470) = 1.98, p = .097, \eta_p^2 = .02$. The main effect for time was significant, $F(1, 470) = 25.86, p < .001$. The main effect of condition was not significant, $F(4) = 1.13, p = .341, \eta_p^2 = .01$. Paired-samples t-tests were conducted post hoc to determine which conditions' scores changed significantly over time. There were statistically significant improvements in overall weight bias for Aerie, $t(96) = 4.67, p < .001$, and HBO, $t(87) = 2.33, p = .022$. See Table 5 for means and standard deviations.

The interaction effect on AFA-Dislike subscale approached significance, $F(4, 470) = 2.26, p = .062, \eta_p^2 = .019$. The main effect for time was not significant, $F(1, 470) = .76, p = .383, \eta_p^2 = .002$. The main effect for condition was not significant, $F(4) = .80, p = .525, \eta_p^2 = .007$. To interpret the interaction effect that approached significance, a one-way between-groups

ANOVA was conducted on the change in dislike weight bias between conditions, $F(4, 470) = 2.26, p = .06$. Post hoc analyses determined that the change in dislike weight bias for Aerie was significantly greater than the change in dislike weight bias for VS, $p = .01$. Changes in AFA-Dislike did not significantly differ between the other conditions, $p > .05$. While the main effect for time was not significant, paired samples t-tests indicated that the difference between AFA-Dislike at pre and post was significantly different for Aerie, $t(96) = 2.36, p = .02$, but not for any other conditions, $p > .05$.

There was no significant interaction between condition and time on AFA-Fear of Fat subscale, $F(4, 470) = .33, p = .856, \eta_p^2 = .003$. However, there was a significant main effect for time, $F(1, 470) = 26.88, p < .001, \eta_p^2 = .05$. The main effect for condition was not significant, $F(4) = 1.04, p = .388, \eta_p^2 = .009$. Paired-samples t-tests were conducted post hoc to determine which conditions changed significantly on AFA-Fear of Fat from pre to post-intervention due to the significant main effect of time (see Table 5 for means and standard deviations). There were statistically significant improvements on fear of fat subscale for Victoria's Secret, $t(100) = 2.05, p = .043$; Control Group, $t(91) = 2.67, p = .009$; and Aerie, $t(96) = 3.29, p = .001$. HBO approached significance, $t(87) = 1.91, p = .059$. Dove was not significant, $t(96) = 1.82, p = .072$.

The interaction effect on AFA-Willpower subscale was not significant, $F(4, 470) = 1.96, p = .099, \eta_p^2 = .02$. The main effect for time was significant, $F(1, 470) = 24.47, p < .001, \eta_p^2 = .05$. The main effect for condition was not significant, $F(4) = .98, p = .416, \eta_p^2 = .009$. Paired-samples t-tests were conducted post hoc to determine which conditions changed significantly on AFA-Willpower from pre to post-intervention due to the significant main effect of time (see Table 5 for means and standard deviations). There were statistically significant improvements

on the willpower subscale for Victoria's Secret, $t(100) = 2.46, p = .016$, and Aerie, $t(96) = 4.87, p < .001$. Dove approached significance, $t(96) = 1.98, p = .05$. HBO, $t(87) = 1.72, p = .089$, and control, $t(91) = .481, p = .631$, were not significant.

Internalized Weight Bias (WBIS). The interaction effect was not significant, Wilks' Lambda = .99, $F(4, 470) = 1.16, p = .327, \eta_p^2 = .01$. The main effect for time was significant, Wilks' Lambda = .99, $F(1, 470) = 4.41, p = .036, \eta_p^2 = .01$. The main effect for condition was not significant, $F(4) = .70, p = .591, \eta_p^2 = .01$. Paired-samples t-tests were conducted post hoc to determine which conditions changed significantly on IWB from pre to post-intervention due to the significant main effect of time (see Table 5 for means and standard deviations). Aerie approached significance, $t(96) = 1.96, p = .053$. Victoria's Secret, $t(100) = .53, p = .595$, Control Group, $t(91) = 1.43, p = .156$, HBO, $t(87) = -.723, p = .472$, and Dove, $t(96) = 1.83, p = .071$, conditions did not significantly differ on IWB from pre to post intervention.

Self-Esteem (RSES). The interaction effect 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 change in self-esteem for Aerie was significantly greater than the change in self-esteem for Victoria's Secret and Control, $p = .03$, the change in self-esteem for Dove was significantly greater than the change in self-esteem for Victoria's Secret and Control, $p = .01$. Changes in self-esteem did not significantly differ between the other conditions, $p > .05$.

Paired-samples t-tests were conducted post hoc to determine which conditions changed significantly on self-esteem from pre to post-intervention due to the significant main effect of time (see Table 5 for means and standard deviations). Participants in the Aerie, $t(96) = -2.92, p = .004$, and Dove, $t(96) = -3.78, p < .001$, conditions showed significant improvement in self-esteem from before to after watching the respective media clips. The participants' improvement in self-esteem after watching the HBO clip approached significance, $t(87) = -1.96, p = .054$. Participants in the Victoria's Secret, $t(100) = .20, p = .840$, and Control Group, $t(91) = .15, p = .878$, conditions did not significantly differ on self-esteem from pre to post intervention.

Body Image (BISS). The interaction effect was not significant, Wilks' Lambda = 1.00, $F(4, 470) = .56, p = .695, \eta_p^2 = .01$. The main effect for time was not significant, Wilks' Lambda = .99, $F(1, 470) = 3.26, p = .072, \eta_p^2 = .01$. The main effect for condition was significant, $F(4) = 2.94, p = .020, \eta_p^2 = .02$. While the main effect for time was not significant, paired samples t-tests showed that Aerie's improvement in momentary body image approached significance, $t(96) = -1.90, p = .06$. The difference in body image between baseline and post-intervention did not differ significantly on any other condition, $p > .05$.

Post-hoc analyses for the significant main effect for condition showed significantly lower momentary body image in Victoria's Secret condition than the Control group (mean difference = $-.21, p = .012$), the HBO group (mean difference = $-.22, p = .009$), and the Dove group (mean difference = $-.23, p = .005$). The scores on momentary body image were not significantly greater in the Aerie condition than the Victoria's Secret condition (mean difference = $-.10, p = .204$). In the context of the current study design, a significant main effect for condition in the absence of a significant interaction required further investigation to determine whether these differences are due to the intervention or to natural group differences at baseline prior to randomization. A one-

way between-group ANOVA indicated the body image scores differed at baseline, $F(4, 470) = 2.48, p = .04$. Participants in the Victoria's Secret condition had significantly lower body image scores at baseline than participants in the Control group, $p = .02$, HBO group, $p = .04$, and Dove group, $p = .02$. Randomization did not eliminate differences between these groups on baseline body image, and therefore, the main effects of condition here are not, in fact, due to the effects of the study.

Positive and Negative Affect (PANAS). The interaction effect on positive affect was significant, Wilks' Lambda = .82, $F(4, 470) = 25.80, p < .001, \eta_p^2 = .18$. The main effect for time was significant, Wilks' Lambda = .99, $F(1, 470) = 6.72, p = .01, \eta_p^2 = .01$. The main effect for condition was 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 VS, $p < .001$, 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, $p = .01$, VS, $p < .001$, and Control, $p < .001$. The decrease in positive affect for VS and Control was significantly greater than the decrease in positive affect for HBO, $p < .01$. Changes in positive affect did not significantly differ between VS and Control, $p = .72$.

Paired-samples t-tests were conducted post hoc to determine which conditions changed significantly on positive affect from pre- to post-intervention due to the significant main effect of time (see Table 5 for means and standard deviations). Participants in the Aerie, $t(96) = -5.78, p < .001$, and Dove, $t(96) = -.14, p = .032$, conditions showed significant increases in positive affect from before to after watching the respective media clips. Participants' positive affect

significantly declined following the Victoria's Secret advertisement, $t(100) = 5.49, p < .001$, and control group clip, $t(91) = 5.43, p < .001$. The participants' positive affect did not significantly decrease after watching the HBO clip, $t(87) = 1.71, p = .09$.

Post hoc analyses for the main effect on condition showed participants who viewed the Aerie advertisement reported significantly greater positive affect than all other conditions (Victoria's Secret mean difference = 3.49, $p = .001$; control group mean difference = 5.28, $p < .001$; HBO mean difference = 2.21, $p = .04$; and Dove mean difference = 2.29, $p = .029$). Participants who viewed the Dove advertisement reported significantly greater positive affect than participants who viewed the control video (mean difference = 2.99, $p = .005$). Participants who viewed the HBO advertisement reported significantly greater positive affect than the participants who viewed the control video (mean difference = 3.07, $p = .005$).

The interaction effect on negative affect 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. Changes in negative affect did not significantly differ between the other groups, $p > .05$.

Paired-samples t-tests were conducted post hoc to determine which conditions changed significantly on negative affect from pre to post-intervention due to the significant main effect of time (see Table 5 for means and standard deviations). Participants in the Aerie, $t(96) = 6.07, p < .001$, Dove, $t(96) = 3.56, p = .001$, Victoria's Secret advertisement, $t(100) = 3.92, p < .001$, and

Control, $t(91) = 4.85, p < .001$, conditions showed significant decreases in negative affect after watching the respective media clips. The participants' negative affect did not significantly decrease after watching the HBO clip, $t(87) = .77, p = .45$.

Post hoc analyses for the significant main effect of condition showed participants who viewed the HBO media clip reported significantly greater negative affect than participants who viewed the Aerie advertisement (mean difference = 1.74, $p = .018$), the Dove advertisement (mean difference = 1.60, $p = .03$), and the control video (mean difference = 2.07, $p = .006$). HBO group did not report significantly greater negative affect than participants who viewed the Victoria's Secret advertisement (mean difference = 1.20, $p = .098$).

Additional Post-Hoc Analyses. Post-hoc repeated measures analyses were run by excluding either the HBO or VS conditions to see if this would change the significance of the interactions for each outcome variable. When either the HBO or VS condition were excluded from the analysis, the interaction for AFA-Total approached significance. When HBO was excluded from the analysis, the interaction for AFA-Dislike became significant. When VS was excluded from the analysis, the interaction for AFA-Willpower became significant. No other changes occurred for other outcome variable interactions when these different groupings were considered post-hoc.

Finally, exploratory post hoc analyses were performed examining the impact of participant weight category (i.e., underweight, normal, overweight, obese) on study outcomes by condition using univariate general linear model. Weight category had little impact on change in attitudes except for participants with obesity demonstrated a somewhat greater reduction in WBIS in response to video than underweight (mean difference = -.38), $p = .04$, and normal weight participants (mean difference = -.33), $p = .002$.

Mediation Analyses

Momentary mood (i.e., affect; PAS and NAS of PANAS) was hypothesized to be a mediator between experimental condition and weight bias, IWB, self-esteem, and body image. Prior to running the mediation analyses, the relationships between change in affect and change in the outcome variables were explored using Pearson correlation coefficient irrespective of condition. Change in positive affect was only significantly correlated with change in self-esteem, $r = .22, p < .001$, with increase in positive affect associated with increase in self-esteem. Conversely, increase in negative affect was significantly associated with decrease in self-esteem, $r = -.19, p < .001$. Increase in negative affect was significantly correlated with an increase in AFA-Dislike, $r = .09, p = .046$, and an increase in IWB, $r = .18, p < .001$.

Mediation analyses using bias-correcting bootstrapping methodology with Hayes' PROCESS macro for SPSS were used to assess the models. Based on the previously reported analyses that only self-esteem had a significant interaction between time and the 5 conditions, it was not expected that many relationships would produce a significant mediation. Seventy mediation analyses were run, as conditions were dummy coded and 5 comparisons were examined for mediation models with each of the 7 outcome variables and 2 affect scales: 1) 0 = Control, 1 = Aerie, 2) 0 = Control, 1 = Dove, 3) 0 = Control, 1 = HBO, 4) 0 = Control, 1 = VS, 5) 0 = Control, 1 = Aerie/Dove/HBO/VS collapsed (ALL).

Three of the 70 mediational models were found to be significant. The relationship of the condition (Control vs. Aerie) was significantly related to positive affect (path a) with Beta = $1.10(.14), p < .001$, and positive affect was significantly related to self-esteem (path b) with Beta = $.18(.07), p = .02$. While the direct relationship between condition (Control vs. Aerie) and self-esteem (path c') was not significant, Beta = $.11(.16), p = .50$, the total relationship between

condition and self-esteem (path c) was significant, $Beta = .31(.14)$, $p = .03$. The indirect effect of condition on self-esteem through positive affect (path a*b) was significant, $CI [.02, .43]$, which indicates that mediation occurred in this model.

The relationship of the condition (Control vs. ALL) was significantly related to positive affect (path a) with $Beta = .58(.11)$, $p < .001$, and positive affect was significantly related to self-esteem (path b) with $Beta = .21(.05)$, $p < .001$. While the direct relationship between condition (Control vs. ALL) and self-esteem (path c') was not significant, $Beta = .10(.12)$, $p = .38$, the total relationship between condition and self-esteem (path c) approached significance, $Beta = .22(.12)$, $p = .05$. The indirect effect of condition on self-esteem through positive affect (path a*b) was significant, $CI [.05, .21]$, which indicated that mediation occurred in this model.

Finally, the relationship of the condition (Control vs. Dove) was significantly related to positive affect (path a) with $Beta = .76(.13)$, $p < .001$, and positive affect was significantly related to AFA-Fear of Fat (path b) with $Beta = .19(.07)$, $p = .01$. The direct relationship between condition (Control vs. Dove) and AFA-Fear of Fat (path c'), $Beta = -.04(.14)$, $p = .77$, and the total relationship between condition and AFA-Fear of Fat (path c), $Beta = .10(.13)$, $p = .45$, were not significant. However, the indirect effect of condition on self-esteem through positive affect (path a*b) was significant, $CI [.01, .29]$, which indicated that mediation occurred in this model.

Chapter IV: Discussion

The current study focused on examining the influence of body positive advertising campaigns on the weight bias, IWB, body image, self-esteem, and momentary mood among female undergraduate students. Specifically, the study aimed to determine whether the Aerie Real and Dove Real Beauty campaigns had a positive impact on weight stigma and IWB as well as whether they encouraged positive body image and self-esteem in women. The two progressive campaigns were contrasted with a prototypical, thin-idealizing advertisement, a Victoria's Secret campaign video. They were also compared with a more typical education approach to weight bias reduction with a clip from "Weight of the Nation," an HBO documentary that has been found successful in one study to reduce attitudes of weight bias (Burmeister et al., 2017).

The widespread prevalence of weight stigma, the detrimental effects of weight bias and IWB on physical and mental health, and the weight-based discrimination in nearly every domain of life are well-documented (Carels et al., 2009; Carels et al., 2017; Puhl et al., 2008; Puhl & Brownell, 2001; Puhl & Brownell, 2006; Puhl & Heuer, 2009; Wott & Carels, 2010). Meanwhile, research on reducing weight bias and IWB is comparatively scarce (Lee et al., 2014) and the origins of weight bias are still poorly understood. Nevertheless, research suggests that the media plays a large role in perpetuating society's negative views of heavier individuals, in part, by promoting the thin ideal and portraying heavier individuals in stigmatizing ways (Ata & Thompson, 2010; Klein & Shiffman, 2006).

In light of the evidence that the media is replete with images that idealize thin individuals and denigrate heavy individuals (Ata & Thompson, 2010; Bonfiglioli et al., 2007; Fouts & Burggraf, 1999; Himes & Thompson, 2007; Kim & Anne Willis, 2007; Klein & Shiffman, 2006;

Lawrence, 2004; Young et al., 2016), there have been recent strides to counteract this negative influence on body image. For example, the Aerie Real and Dove Real Beauty campaigns were designed to promote positive body image, encourage self-acceptance, and communicate the harmful effects of female beauty standards. The thin ideal puts a unique pressure on women, who tend to be affected by weight stigma more than men (Puhl, Andreyeva, & Brownell, 2008). Women are the target audience of the AerieReal and Dove RealBeauty campaigns in an effort to combat the harmful thin ideal perpetuated in our society through media.

Research on the Dove Campaign for Real Beauty and the Aerie Real Campaign is limited. The Dove Real Beauty campaign has been studied thus far in a case study (Murray, 2013) and focus groups (Scott & Cloud, 2008; Taylor et al., 2016) discussing whether the campaign supports feminism. The Dove campaign has also been researched regarding its effects on mood (Kraus & Myrick, 2018) and body-focused anxiety (Anschutz, Engels, Becker, & Van Strien, 2009). The Aerie Real campaign has only been evaluated previously by one research study, which assessed for the effect of retouched vs. non-retouched print images on body satisfaction in young women (Convertino et al., 2016). Additional research on the impact that these campaigns have on body image and mood, as well as weight bias, IWB, and self-esteem was certainly warranted.

Hypothesis 1: Weight Bias and IWB

The first hypothesis regarded change in weight bias and IWB. It was hypothesized that the women who viewed either the Aerie Real or Dove Real Beauty advertisements would demonstrate a greater reduction in weight bias and IWB than participants who viewed the Victoria's Secret advertisement, HBO documentary clip, or the control video of Denali National

Park documentary clip. Unfortunately, there was limited support for this hypothesis with no significant condition and time interaction effects on the global measures of weight bias and IWB.

While differences between conditions were not evident by the global weight bias and IWB measures, strong differences 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 VS or Control videos. The VS campaign generated attitudes of dislike toward persons with overweight and obesity more than the Aerie, Dove, and Control videos. Therefore, while scores on the global measures did not change, the responses to the videos were in the direction of improving weight-based attitudes. This finding is consistent with prior findings that even brief video interventions can significantly reduce weight bias (Burmeister et al., 2017; Poustchi et al., 2017).

Not only did the sample as a whole endorse a minimal level of dislike toward persons with overweight and obesity in reaction to the videos (see Table 4), but the sample also generally denied holding dislike anti-fat attitudes (see Table 5). It is possible that the lack of change in dislike for people with extra weight in the current study may reflect a floor effect of minimal bias. While it is possible that the current sample has low weight bias, it may be overly optimistic to entertain the idea that weight stigma has diminished that significantly in the population; a more likely explanation of the low report of dislike for people with extra weight in the current sample reflects a growing recognition by the public that it is not socially acceptable to admit to prejudice against individuals with obesity.

Of course, the current study assessed explicit weight bias. People are aware of their explicit attitudes or beliefs, which are captured by self-report measures, while implicit attitudes

refer to automatic and unconscious bias that more strongly influences behavior (Dovidio, Kawakami, & Gaertner, 2002; Wilson, Lindsey, & Schooler, 2000). Explicit and implicit are different forms of bias and are measured differently, at least in part, due to issues such as accurate memory retrieval and motivations to underreport bias (Bessenoff & Sherman, 2000; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). In fact, people appear to exhibit lower bias when measuring explicit bias rather than implicit bias (Hofmann et al., 2005). It is possible participants were able to consider their responses to the initial assessment prior to watching the videos. However, while implicit measures may reveal higher levels of anti-fat attitudes, implicit attitudes have proven very difficult to change with a one-time video intervention (Domoff et al., 2012; Gapinski, Schwartz, & Brownell, 2006). Future research examining change in implicit bias following media exposure is an important area of future inquiry.

Women who viewed the VS campaign endorsed that the video made them feel bad about themselves and their bodies more than participants in any other condition. Women who viewed the HBO video also reported feeling worse about themselves and their bodies than women who viewed the Aerie or Control videos. This finding may reflect a difference between the content of educational and body positive media. The HBO documentary content informs viewers of the negative impact of weight stigma and shared personal accounts of weight-based discrimination. This content may provide an explanation for why women felt worse about themselves and their bodies after watching the HBO clip compared with women who watched the Aerie or Control videos. In contrast, Aerie's content was upbeat with peppy music and personal accounts of women loving their bodies and feeling comfortable in their own skin.

Finally, it is encouraging that women who viewed the Dove campaign demonstrated improvement on willpower weight bias, and women who viewed the HBO documentary clip improved significantly on overall weight bias. Women who viewed the Aerie campaign demonstrated significant improvement on overall, fear of fat, and willpower weight bias as well as reduced IWB. Aerie purports their campaign portrays women that “ignite empowerment and share their positive vibes.” This seems consistent with a study using a post-test only design that demonstrated an association between a body-focused gratitude writing exercise and lower IWB and better body image compared to a control (Dunaev, Markey, & Brochu, 2018). The current study’s findings support Aerie’s claim that they have created an upbeat, positive video that encourages women to feel gratitude and acceptance toward their bodies.

While one must use caution in interpreting these exploratory findings, it was unexpected that the women who viewed the VS and Control videos demonstrated reduced fear of fat weight bias, and the women who viewed the VS video demonstrated reduced willpower weight bias subscale was unexpected. One possible explanation is the study design; participants were asked questions about weight bias and IWB approximately one week prior to watching the video. This exposure could have primed the women to consider their weight-based beliefs, and in turn, influenced the effect of the videos on these subscales. This explanation describes a threat to internal validity called instrument reactivity (Allen, 2017). For example, diminished fear of fat was observed in the Control group, which only viewed a documentary clip about Denali National Park, media content completely unrelated to weight. Yet, fears of becoming fat were diminished in women who watched this geographic film clip. Additionally, the VS campaign video consists of a homogeneous display of thin, beautiful women. It is possible that the viewers acknowledged that the beauty standards portrayed in VS campaigns were unrealistic and could

not be obtained by willpower alone and, thereby, rejected anti-fat attitudes more fiercely after watching the VS video. While intriguing, such an unintended and potentially positive impact of the video needs to be replicated and studied further. The limitations in the study design that threaten internal validity suggest overall caution in the interpretation of the current study's findings.

Hypothesis 2: Body Image, Self-Esteem, and Affect

The second hypothesis concerned the changes in self-esteem, body image, and affect. It was hypothesized that the participants who viewed either the AerieReal or Dove Real Beauty advertisements would report improved self-esteem, body image, and affect, from pre- to post-viewing while the participants who viewed the Victoria's Secret advertisement would report worsened self-esteem, body image, and affect; participants in the HBO documentary clip or in the control group would report unchanged self-esteem, body image, and affect. The current study demonstrated mixed support for this hypothesis.

Body Image. Aerie and Dove campaigns claim to encourage positive body image in women, but a one-time exposure did not change momentary body image. There were no group differences in change on this construct. It is possible this null finding suggests body image, even when asked how one feels about their body "right now," is similar to weight bias and IWB as constructs that form over a person's lifetime (Martin, 2010). However, 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) but not all (Anschutz et al., 2009).

The null findings for body image, weight bias, and IWB beg the question for whether an increased dose of exposure to the campaigns would produce changes on these variables of interest. The necessity of repeated exposure to television advertisements in order to persuade

viewers has been a topic of discussion for decades (Krugman, 1965). Consumers tend to remember print advertisements better than television commercials, because they can process the print information at their own pace and watching requires minimal cognitive processing compared with reading (Furnham, 2019). Considering this distinction, the Aerie and Dove video campaigns studied in the current investigation may not be the most effective medium for changing beliefs or at least might require repeated or larger doses of the videos. Previous research studying print advertisements successfully found worse body image, mood, and self-esteem in response to prints of thin ideal (Bessenoff, 2006). Further comparison of print and video forms of body positive advertisements should be evaluated in future research to confirm the more effective method of communicating positive body image messages.

Self-Esteem. The current study's findings generally supported the hypothesis regarding self-esteem. The women who viewed the Aerie and Dove campaigns demonstrated improved self-esteem compared with the women who viewed the VS and Control videos, which remained fairly stable. Meanwhile, women who watched the HBO video were in the direction of improved self-esteem. Considering exposure to the thin ideal in print advertisements has been related to lowered self-esteem (Bessenoff, 2006), it is encouraging that the Aerie and Dove campaigns are making strides to have a positive effect on self-esteem. This effect is important as self-esteem is correlated with IWB and general health (Durso & Latner, 2008; Vartanian & Novak, 2011). The difference that a two-minute advertisement can have on self-esteem, even if the effects are not sustained over time, is promising for the positive change that may follow repeated exposures to media containing positive messages to women about self and body acceptance. Considering this is the first study to examine these campaigns' effect on self-esteem, the findings require replication by additional research.

Affect. Women who viewed the Aerie campaign reported a greater improvement in positive affect than any of the other conditions and a greater reduction in negative affect than women who viewed the HBO video. The upbeat music combined with Aerie's positive body acceptance message may have contributed to the improved mood of its viewers. An entirely positive and uplifting video devoid of any negative topics about the harmful effects of the thin ideal or weight bias was the most effective way to improve momentary mood. The Dove video also had a positive effect on momentary mood, but the women who viewed the HBO, VS, and Control videos reported a decline in positive affect. While both the Dove and the HBO videos discussed the negative implications weight bias, Dove also included women's opinions against weight-based discrimination. The Dove campaign has a message of encouragement to embrace your body regardless of society's beauty standards. Perhaps the balance of education and empowerment protected the Dove video from reducing positive affect unlike the HBO video, which increased the saliency of the negative weight stigma implications, thereby lowering its audience's positive affect.

Women who viewed the VS and Control videos reported a decrease in positive affect that was greater than the change in positive affect for HBO. Control reduced negative affect more than HBO, and VS also reduced negative affect but not significantly different from other conditions. Despite the upbeat music in the background of the VS video, the display of unrealistic female body types may have been the cause of diminished positive affect. It is possible that the Control video resulted in decreased positive affect due to the lack of entertainment or interest in the video's topic. While it may seem unusual that VS and Control simultaneously reduced both positive and negative affect, increase in positive affect is not dependent on a decrease in negative affect. Research has demonstrated that positive and

negative affect are two independent constructs and are not necessarily correlated (Watson & Tellegen, 1985).

What is odd, however, is that a video idealizing the thin ideal and a monotonous video about the formation of a mountain would result in improved mood, but seemingly paradoxical findings are not unusual in this area of study. In another study, for example, the video portraying individuals with obesity in a stereotypic negative manner reduced weight bias while the positive video did not (Gapinski et al., 2006). Additionally, the control and VS videos may have served as a useful distraction from boredom or negative affect. Finally, while the goal of the current study was to capture mood in the moment immediately following the video, there may have been external events influencing the reported affect, also known as history effects (Allen, 2017). For example, participants' mood states immediately prior to the video related to external life events may have influenced their affect ratings immediately after watching the video. Hence, it is possible that mood changes are not entirely due to the 2-minute video clip, although given the study's randomized design, this explanation seems somewhat unlikely.

Hypothesis 3: Affect as a Mediator

The third hypothesis was exploratory, proposing momentary mood as a potential mediator between the experimental condition and weight bias, IWB, self-esteem, and body image. The current study demonstrated no evidence for negative affect as a mediator and minimal evidence for positive affect as a mediator of change in attitudes. The indirect effect of the Aerie condition on change in self-esteem through change in positive affect was significant. The indirect effect of Aerie, Dove, HBO, and VS conditions collectively on change in self-esteem through change in positive affect was also significant, which suggests that the relationship between affect and self-esteem may be worthy of future inquiry.

Although the hypothesized mediation was mostly unsubstantiated in the current study, the ecological momentary assessment (EMA) and daily diary weight stigma literature supports the relationship between mood and weight bias. Carels et al. (2017) demonstrated that weight stigmatizing experiences were associated with more negative and fewer positive emotions over a two week period. Likewise, positive and negative affect mediated the relationships between IWB and coping responses, body appreciation, and eating and exercise behaviors over a 30-day period (Carels et al., 2018). A possible reason for the lack of evidence for affect mediation in the current study included the low dose of intervention (i.e., one-time brief video) that produced null changes in the attitudes of interest. Another possible reason is that attitude formation is complex and involves both cognitive and affective components (Edwards, 1990). Perhaps, change in anti-fat attitudes depends on more than evoking positive or negative emotions.

Weight-Related Sample Characteristics and Baseline Variables

Previous research has demonstrated an inverse relationship between BMI and both implicit and explicit anti-fat attitudes (Schwartz, Vartanian, Nosek, & Brownell, 2006), which is consistent with the current study's sample in which lower BMI was related to more dislike and willpower anti-fat attitudes at baseline. In contrast, higher BMI was linked to greater levels of fear of fat weight bias. The fear of fat subscale captures anti-fat attitudes directed toward the self, such as the extent of feelings of catastrophe and disgust associated with personal weight gain. Thus, it was not surprising that greater IWB was also correlated with greater fear of fat and higher BMI at baseline. These relationships found in the current study's sample are consistent with literature noting individuals with overweight have greater weight-related anxieties (Cash, Counts, & Huffine, 1990) and evidence of the same relationship between higher BMI and higher scores on the AFA-Fear of Fat subscale (O'Brien et al., 2013). Taken together, heavier women

in the current study held self-directed anti-fat attitudes that mirror IWB while thinner women held anti-fat attitudes directed toward others (i.e., dislike and blame/willpower attitudes).

The relationship between BMI and self-esteem was consistent with the literature (Durso & Latner, 2008). The current study demonstrated that higher BMI was associated with lower self-esteem. Due to the documented association between self-esteem and IWB (Durso & Latner, 2008) and the previously discussed findings relating BMI to IWB, the relationships between higher BMI and lower self-esteem and worse body image were in the anticipated directions.

Lent et al. (2014) demonstrated high levels of IWB in a weight loss seeking research sample. The current study's sample demonstrated a similar relationship between a history of weight loss attempts and greater IWB. Participants in the current study with a weight loss attempt history also endorsed lower self-esteem, worse body image, more negative affect, and greater overall, fear of fat, and willpower weight bias. These relationships did not change even after controlling for BMI. It may be interpreted that some individuals seeking to lose weight are unhappy with their bodies, have anti-fat attitudes, and generally do not feel good about themselves, irrespective of their actual weight. The endorsement of willpower weight bias reflects the belief that weight is controllable with diet and exercise, which would coincide with these individuals' endorsement of past weight loss efforts.

The current study's sample with a history of eating or exercise disorder reported worse body image and lower self-esteem than those with no disordered eating or exercise history. Hausenblas and Fallon (2006) have documented that poor body image is associated with eating disorders. Not dissimilar from a weight loss attempt history, participants with an eating/exercise disorder history also reported more negative affect, greater overall and fear of fat weight bias, and greater IWB. These relationships remained significant even after controlling for BMI.

Individuals with eating disorders have distorted views of their bodies (Rosen, 1990) and poor body image has been connected with high anti-fat attitudes (O'Brien, Hunter, Halberstadt, & Anderson, 2007). Therefore, the current study's findings that link eating and exercise disorder histories to weight bias are consistent with the literature and not a function of current BMI.

The current study demonstrated relationships between engaging in an exercise routine and greater overall, dislike, fear of fat, and willpower weight bias than participants not engaging in a regular physical activity regime. These relationships did not change even after controlling for BMI. While there are not studies specifically stating that exercisers exhibit a higher degree of anti-fat attitudes, it has been documented that stigmatizing experiences often occur in the gym (Schvey et al., 2017). Perhaps, this could be related to regular exercisers reporting greater anti-fat attitudes in the current study. Targets of stigmatizing experiences are less likely to engage in physical activity (Sattler, Deane, Tapsell, & Kelly, 2018), but perhaps having greater anti-fat attitudes is somehow related to increased motivation to exercise. Engaging in regular exercise was also associated with higher positive affect in the current study's sample, which is consistent with literature linking physical activity with improved mood (Yeung, 1996).

Baseline Variable Correlations

Greater overall weight bias at baseline was associated with higher scores on the three weight bias subscales (dislike, fear of fat, and willpower) as well as more negative affect and greater IWB. Greater overall weight bias was also related to worse body image and lower self-esteem. Additionally, greater IWB was associated with more negative affect, lower self-esteem, worse body image, and lower positive affect. Further, higher self-esteem was associated with better body image and higher positive affect. Higher self-esteem and body image were both related to lower negative affect. These findings are consistent with the literature discussing

psychological correlates of weight bias and IWB (Carels et al., 2010; Durso & Latner, 2008; Lent et al., 2014; Pearl & Puhl, 2016). Taken together, it seems that individuals with better body image and higher self-esteem are less likely to hold anti-fat attitudes toward others (weight bias) or toward themselves (IWB) and more likely to exhibit positive mood states.

Limitations

There were limitations to the current study that should be considered in light of the interpretation of the findings. The study sample was drawn from a pool of undergraduate students enrolled in the introduction to psychology course at a large southeastern university. The sample was entirely female, two-thirds white, and majority normal weight. One must use caution in generalizing the current study's findings to an older, more ethnically diverse, and heavier sample. Weight discrimination is experienced more by persons that are younger and heavier (Puhl et al., 2008). While weight discrimination may not vary by race for women with high BMIs (Puhl et al., 2008), the literature suggests that thin ideal is internalized differently by women of different races (Powell & Kahn, 1995). Therefore, a sample with more ethnic minorities may find different responses to the advertising campaigns promoting or demoting the thin ideal. The findings should not be generalized to men as women experience higher rates of weight discrimination (Puhl et al., 2008), and the ideal body type differs by gender and, therefore, men's response to the Aerie and Dove campaigns studied here could be quite different (Barlett, Vowels, & Saucier, 2008).

Second, some of the outcome variables of interest may be relatively stable constructs that have developed over time and multiple exposures, suggesting a higher intervention dose than a 2-minute video clip may be necessary. Weight bias, IWB, and body image consist of beliefs about oneself, others, and weight as related to a person's value and characteristics. These beliefs

begin to develop at a very young age and form throughout one's lifetime through exposure to media (Martin, 2010). While it would have been impressive if a single dose of a brief advertising campaign produced significant changes on consistent beliefs, such observed changes were unlikely. Further, threats to internal validity, such as history effects, maturation effect, and the Hawthorne effect, could be at play (Allen, 2017). Hawthorne effect refers to the awareness that one is in a study influencing how a participant answers questions; for example, they may try to guess what the researchers "want" or respond in a socially desirable manner. 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.

Some of the limitations stemming from threats to internal validity are due to the pretest-posttest study design of the current study. The timespan of one week between the two parts of the study was determined to eliminate the burden of complete the same questionnaires immediately before and after viewing the media clip. This period of time was also selected due to a similar intervention that implemented a one week period between baseline and viewing media (Burmeister, et al., 2017). Due to this design, the current study lacked control of what a participant was exposed to in the week between completing the baseline assessment and viewing their randomly assigned video. The external events between baseline and watching the video (i.e., history effects) may have influenced participants' responses to the questionnaires following the video. For example, participants may have had a particularly good or bad day before watching the video, or they may have viewed 10 VS ads on TV that week but then were randomized to the Dove condition. Of course, extraneous events would likely be equally distributed across conditions, but, could, nevertheless, have impact participants irrespective of condition. Additionally, 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. This phenomenon is known as instrument reactivity (Allen, 2017); answering questions at baseline about weight bias, body image, etc., may affect how participants perceived the video and responded to subsequent measures. These are all important concerns to consider in light of the current findings and for future directions. Such limitations and threats to internal validity speak to the challenges of the emerging area of research on weight bias reduction interventions.

Future Directions

Future research may consider implementing a larger intervention dose. 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, perhaps multiple campaigns from the same company could be strung together or the same campaign could be shown repeatedly to provide a larger dose of intervention. Cultivation theory refers to the cumulative impact of watching television or exposure to media over time on viewers' attitudes and beliefs (Kosut, 2014; Shanahan, Signorielli, & Morgan, 2014). Cultivation theory 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). The current findings suggest that a single brief exposure does not have a lasting impact on body image. However, the significant differences between conditions on how the videos made the participants feel about themselves and their bodies is encouraging and suggests a positive advertising campaign over a longer period of time, such as a lifetime, may indeed have a positive effect on body image. Preliminary research on the Aerie and Dove campaigns have suggested

that they impact mood (Kraus & Myrick, 2018), body-focused anxiety (Anschutz et al., 2009), and body satisfaction (Convertino et al., 2016). Future research directions should consider repeated exposures to Aerie and Dove campaigns to further study the potential for positive outcomes on weight-related constructs. Consideration of using print forms of the campaigns is also warranted due to evidence that consumers remember print media more than video media (Furnham, 2019).

While it would be challenging to design a study that would replicate the way we are exposed to advertising campaigns in our daily lives, such ecologically valid studies are greatly needed. It is important that research efforts persist to make progress in learning about how weight-related beliefs interact with such media consumption. Until a study is designed to capture media effects in this way, how future researchers frame questions is important to consider. In the current study, participants responded differently based on whether they were asked *specifically* how the video made them feel about their body versus asked plainly how they feel about their body in the current moment. Asking viewers to specifically reflect on how the media clip makes them feel or think about these variables of interest may better capture the immediate effect that the video has on them. In fact, simply asking participants to reflect on an experience may heighten its impact and serve as a mini-intervention on attitude change (O’Keefe, 2013).

The current study’s limited demographics lend itself to ideas for future research directions. While body positive campaigns have not been designed for a male audience yet, it would be interesting to examine the impact of positive and negative media sources for men as well. Research has indicated that men also feel pressures from the media to conform to a muscular ideal male body type (Barlett, Vowels, & Saucier, 2008). It is not known if men would

respond differently to campaigns empowering men to embrace their “real” bodies, but the efforts would look different considering the disparity between male and female “ideal” body types promoted in the media.

Conclusion

The area of literature on reducing weight bias is emerging and it will take time to find the most effective approach to changing attitudes. The extant literature on weight bias reduction interventions has been categorized as either controllability, empathy, or social consensus (Lee et al., 2014). There have been no differences between intervention type and attitude change as they all produced small reductions in weight bias. It may be speculated that simply making one’s weight biases salient, regardless of the method, is helpful in changing beliefs and attitudes, but this type of awareness and reflection is likely not a daily occurrence for most people. The current study was innovative in taking media that is used in the “real world” and examining its potential as a weight bias reduction intervention. While the findings in the current study were limited concerning actual reduction in anti-fat attitudes or IWB, participants’ reactions to the videos were encouraging. This study might be categorized as the “fresh wave” of research that Lee and colleagues (2014) called for and with additional research, it is possible we may find that body positive advertising campaigns have the desired effects on weight-related attitudes. This study has a potential greater scope regarding its implications, because these campaigns are more accessible in people’s everyday lives than interventions that only research participants would be exposed to.

The current study was the first to look at advertising campaigns as a path for positive change in the areas of weight bias and internalized weight bias. Nevertheless, given wide audience that media reaches in everyday life, the effects over time could be powerful. The

current study's participants' specific reactions to the body positive campaigns compared with a parallel prototypical thin-idealizing campaign were promising. There is no doubt that through the promotion of the company's products advertisements shape society's beliefs and attitudes. While it is likely that companies' incentive to include women with more diverse body shapes and sizes in their advertisements is to expand their consumer base, some companies have shown that it is possible to be profitable and socially conscience. Perhaps, the advertisements of Aerie and Dove are examples of this synergy.

The Aerie and Dove campaigns were quite successful in their efforts to capture the attention of an audience of young adult women. Viewers liked Aerie and Dove better and thought they were more entertaining and had better production quality than the HBO, VS, and Control media clips. If viewers like, are entertained, and pay attention to an advertisement, they may be one step closer to internalizing the positive messages around body acceptance and self-esteem.

Advertisements undoubtedly have the power to shape attitudes and beliefs around weight. 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). Similarly, public health campaigns for obesity prevention have been guilty of perpetuating weight stigma by implicating weight controllability (Puhl et al., 2013a; Puhl et al., 2013b; Young et al., 2016). While research specifically examining public health campaigns would be required to confirm this, it is plausible given the current findings about advertising campaigns that including a message of empowerment and body acceptance may be a more effective and less stigmatizing approach.

The exact amount of exposure and time required for the impact of 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 influenced their audience. Viewers found the Aerie and Dove campaigns to have a positive, uplifting, and empowering message. The 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. Meanwhile, the VS campaign made viewers feel bad about themselves and their bodies and dislike persons with overweight and obesity.

This investigation highlights the fact 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. While weight bias and IWB are complex and stable beliefs that are formed over time, Aerie and Dove campaigns not only made viewers more accepting of diverse body shapes and sizes but improved their self-esteem and put viewers in a better mood. Given that there are so many 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 in the direction of improving body image and counteracting weight stigma for women.

References

- Aerie. (2016, August 1). *The share your spark experience* [Video file]. Retrieved from <https://www.youtube.com/watch?v=UktgRC1p7Bc>
- Allen, M. (2017). One-group pretest-posttest design. In *The SAGE encyclopedia of communication research methods*. Retrieved from <https://ebookcentral.proquest.com/lib/eastcarolina/reader.action?docID=4841518#>
- Amy, N. K., Aalborg, A., Lyons, P., & Keranen, L. (2006). Barriers to routine gynecological cancer screening for white and African American obese women. *International Journal of Obesity*, 30(1), 147-155. doi:10.1038/sj.ijo.0803105
- Andrew, R., Tiggemann, M., & Clark, L. (2016). Predictors and health-related outcomes of positive body image in adolescent girls: A prospective study. *Developmental Psychology*, 52(3), 463-474. doi:10.1037/dev0000095
- Andreyeva, T., Puhl, R. M., & Brownell, K. D. (2008). Changes in perceived weight discrimination among Americans, 1995-1996 through 2004-2006. *Obesity*, 16(5), 1129-1134. doi:10.1038/oby.2008.35
- Annis, N. M., Cash, T. F., & Hrabosky, J. I. (2004). Body image and psychosocial differences among stable average weight, currently overweight, and formerly overweight women: The role of stigmatizing experiences. *Body Image*, 1(2), 155-167. doi:10.1016/j.bodyim.2003.12.001
- Anschutz, D. J., Engels, R. C. M. E., Becker, E. S., & Van Strien, T. (2009). The effects of TV commercials using less thin models on young women's mood, body image and actual food intake. *Body Image*, 6(4), 270-276. doi:10.1016/j.bodyim.2009.07.007

- Ashmore, J. A., Friedman, K. E., Reichmann, S. K., & Musante, G. J. (2008). Weight-based stigmatization, psychological distress, & binge eating behavior among obese treatment-seeking adults. *Eating Behaviors, 9*(2), 203-209. doi:10.1016/j.eatbeh.2007.09.006
- Ata, R. N., & Thompson, J. K. (2010). Weight bias in the media: A review of recent research. *Obesity Facts, 3*(1), 41-46.
- Barlett, C. P., Vowels, C. L., & Saucier, D. A. (2008). Meta-analyses of the effects of media images on men's body-image concerns. *Journal of Social and Clinical Psychology, 27*(3), 279–310. <https://doi-org.jproxy.lib.ecu.edu/10.1521/jscp.2008.27.3.279>
- Bessenoff, G. R., & Sherman, J. W. (2000). Automatic and controlled components of prejudice toward fat people: Evaluation versus stereotype activation. *Social Cognition, 18*(4), 329-353.
- Bertakis, K. D., & Azari, R. (2005). The Impact of Obesity on Primary Care Visits. *Obesity Research, 13*(9), 1615-1623. doi:10.1038/oby.2005.198
- Bessenoff, G. R. (2006). Can the media affect us? social comparison, self-discrepancy, and the thin ideal. *Psychology of Women Quarterly, 30*(3), 239-251. doi:10.1111/j.1471-6402.2006.00292.x
- Blaine, B. E., DiBlasi, D. M., & Connor, J. M. (2002). The effect of weight loss on perceptions of weight controllability: Implications for prejudice against overweight people. *Journal of Applied Biobehavioral Research, 7*(1), 44-56.
- Bonfiglioli, C. M. F., Smith, B. J., King, L. A., Chapman, S. F., & Holding, S. J. (2007). Choice and voice: Obesity debates in television news. *Medical Journal of Australia, 187*(8), 442-445.

- Bouma-Prediger, S. (2017). When Will “Real Bodies” Mean All Bodies?: A Critical Look at the #AerieREAL Ad Campaign.
- Brown, I., Thompson, J., Tod, A., & Jones, G. (2006). Primary care support for tackling obesity: A qualitative study of the perceptions of obese patients. *British Journal of General Practice*, 56(530), 666-672.
- Brownell, K. D., Puhl, R., Schwartz, M. B., & Rudd, L. (Eds.). (2005). *Weight bias: Nature, consequences, and remedies*. New York: Guilford Press.
- Burmeister, J. M., Kiefner, A. E., Carels, R. A., & Musher-Eizenman, D. R. (2013). Weight bias in graduate school admissions. *Obesity (Silver Spring, Md.)*, 21(5), 918-920.
doi:10.1002/oby.20171
- Burmeister, J., Taylor, M., Kiefner-Burmeister, A., Borushok, J., & Carels, R. A. (2017). Reducing obesity stigma via a brief documentary film--a randomized trial, *Stigma and Health*, 2(1), 43
- Carels, R. A., Hlavka, R., Selensky, J. C., Solar, C., Rossi, J., & Miller, J. C. (2018). A daily diary study of internalised weight bias and its psychological, eating and exercise correlates. *Psychology & Health*. <https://doi-org.jproxy.lib.ecu.edu/10.1080/08870446.2018.1525491>
- Carels, R. A., & Musher-Eizenman, D. R. (2010). Individual differences and weight bias: Do people with an anti-fat bias have a pro-thin bias?. *Body Image*, 7(2), 143-148.
- Carels, R. A., Rossi, J., Solar, C., & Selensky, J. C. (2017). An ecological momentary assessment of weight stigma among weight loss participants. *Journal of health psychology*, 1359105317692855.

- Carels, R. A., Rossi, J., Solar, C., & Selensky, J. C. (2017a). Changes in perceived mate value and weight bias associated with former obesity status. *Stigma and Health*. Advance online publication. <http://dx.doi.org/10.1037/sah0000071>
- Carels, R. A., Wott, C. B., Young, K. M., Gumble, A., Koball, A., & Oehlhof, M. W. (2010). Implicit, explicit, and internalized weight bias and psychosocial maladjustment among treatment-seeking adults. *Eating Behaviors, 11*(3), 180-185.
doi:10.1016/j.eatbeh.2010.03.002
- Carels, R.A., Young, K.M., Wott, C.B., Harper, J., Gumble, A., Oehlof, M.W., & Clayton, A.M. (2009). Weight bias and weight loss treatment outcomes in treatment seeking adults. *Annals of Behavioral Medicine, 37*, 350-355.
- Carr, D., & Friedman, M. A. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health and Social Behavior, 46*(3), 244-259. doi:10.1177/002214650504600303
- Cash, T. F., Counts, B., & Huffine, C. E. (1990). Current and vestigial effects of overweight among women: Fear of fat, attitudinal body image, and eating behaviors. *Journal of Psychopathology and Behavioral Assessment, 12*(2), 157-167.
- Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders: The Journal Of Treatment & Prevention, 10*(2), 103-113.
doi:10.1080/10640260290081678
- Chen, E. Y., & Brown, M. (2005). Obesity Stigma in Sexual Relationships. *Obesity Research, 13*(8), 1393-1397. doi:10.1038/oby.2005.168

- Chrisler, J. C., Fung, K. T., Lopez, A. M., & Gorman, J. A. (2013). Suffering by comparison: Twitter users' reactions to the Victoria's Secret Fashion Show. *Body image, 10*(4), 648-652.
- Convertino, A. D., Rodgers, R. F., Franko, D. L., & Jodoin, A. (2016). An evaluation of the Aerie Real campaign: Potential for promoting positive body image?. *Journal of health psychology, 1359105316680022*.
- Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66*, 882–894.
- Crosnoe, R. (2007). Gender, obesity, and education. *Sociology Of Education, 80*(3), 241-260.
doi:10.1177/003804070708000303
- Diabetes Prevention Program Research Group (DPP). (2002). Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *New England Journal of Medicine, 346*(6), 393-403.
- Diedrichs, P. C., & Barlow, F. K. (2011). How to lose weight bias fast! Evaluating a brief anti-weight bias intervention. *British journal of health psychology, 16*(4), 846-861.
- Domoff, S. E., Hinman, N. G., Koball, A. M., Storfer-Isser, A., Carhart, V. L., Baik, K. D., & Carels, R. A. (2012). The effects of reality television on weight bias: An examination of The Biggest Loser. *Obesity, 20*(5), 993-998.
- Dove US. (2016, December 2). *Dove – beauty standards of weight are a form of bias* #BeautyBias [Video file]. Retrieved from <https://www.youtube.com/watch?v=mZ05C1o9utg>
- Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of personality and social psychology, 82*(1), 62.

- Dunaev, J., Markey, C. H., & Brochu, P. M. (2018). An attitude of gratitude: The effects of body-focused gratitude on weight bias internalization and body image. *Body Image, 25*, 9-13. doi:10.1016/j.bodyim.2018.01.006
- Durso, L. E., & Latner, J. D. (2008). Understanding self-directed stigma: Development of the Weight Bias Internalization Scale. *Obesity, 16*(suppl2), S80-S86. doi:10.1038/oby.2008.448
- Durso, L. E., Latner, J. D., & Ciao, A. C. (2016). Weight bias internalization in treatment-seeking overweight adults: Psychometric validation and associations with self-esteem, body image, and mood symptoms. *Eating Behaviors, 21*, 104-108. doi:10.1016/j.eatbeh.2016.01.011
- Falkner, N. H., French, S. A., Jeffery, R. W., Neumark-Sztainer, D., Sherwood, N. E., & Morton, N. (1999). Mistreatment due to weight: prevalence and sources of perceived mistreatment in women and men. *Obesity Research, 7*(6), 572-576.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160.
- Ferguson, C. J. (2013). In the eye of the beholder: Thin-ideal media affects some, but not most, viewers in a meta-analytic review of body dissatisfaction in women and men. *Psychology of Popular Media Culture, 2*(1), 20–37. <https://doi-org.jproxy.lib.ecu.edu/10.1037/a0030766.supp> (Supplemental)
- Finkelstein, E. A., Trogdon, J. G., Cohen, J. W., & Dietz, W. (2009). Annual medical spending attributable to obesity: payer-and service-specific estimates. *Health affairs, 28*(5), w822-w831.

- Fouts, G., & Burggraf, K. (1999). Television situation comedies: Female body images and verbal reinforcements. *Sex Roles, 40*(5-6), 473-481. doi:10.1023/A:1018875711082
- Furnham, A. (2019). Advertising: The contribution of applied cognitive psychology. *Applied Cognitive Psychology, 33*(2), 168-175. doi:10.1002/acp.3458
- Gapinski, K. D., Schwartz, M. B., & Brownell, K. D. (2006). Can television change anti-fat attitudes and behavior? *Journal of Applied Biobehavioral Research, 11*(1), 1-28.
- Geier, A. B., Schwartz, M. B., & Brownell, K. D. (2003). “Before and after” diet advertisements escalate weight stigma. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 8*(4), 282-288.
- Gerbner, G., Gross, L., & Morgan, M. (2002). Growing up with television: Cultivation processes. In J. Bryant & D. Zillman (Eds.), *Media effects: Advances in theory and research* (2nd ed., pp. 43–67). Mahwah, NJ: Erlbaum.
- Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. New York: Simon and Schuster.
- Gollust, S. E., Eboh, I., & Barry, C. L. (2012). Picturing obesity: Analyzing the social epidemiology of obesity conveyed through US news media images. *Social Science & Medicine, 74*, 1544–1551.
- Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin, 134*(3), 460–476. <https://doi-org.jproxy.lib.ecu.edu/10.1037/0033-2909.134.3.460>

- Gray-Little, B., Williams, V.S.L., & Hancock, T. D. (1997). An item response theory analysis of the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin*, 23, 443-451.
- Greenberg, B. S., Eastin, M., Hofschire, L., Lachlan, K., & Brownell, K. D. (2003). Portrayals of overweight and obese individuals on commercial television. *American Journal Of Public Health*, 93(8), 1342-1348. doi:10.2105/AJPH.93.8.1342
- Groesz, L. M., Levine, M. P., & Murnen, S. K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of eating disorders*, 31(1), 1-16.
- Grosko, T. A. (2010). Obesity stigma reduction. *Dissertation Abstracts International*, 70, 4483.
- Hatzenbuehler, M. L., Phelan, J. C., & Link, B. G. (2013). Stigma as a fundamental cause of population health inequalities. *American Journal Of Public Health*, 103(5), 813-821. doi:10.2105/AJPH.2012.301069
- Hausenblas, H. A., & Fallon, E. A. (2006). Exercise and body image: A meta-analysis. *Psychology & Health*, 21(1), 33-47. <https://doi-org.jproxy.lib.ecu.edu/10.1080/14768320500105270>
- Hayes, A.F. (2018). *Introduction to mediation, moderation, and conditional process analysis* (2nd ed.). T.D. Little (Ed.). New York, NY: Guilford Press.
- Heider, F. (1958). *The psychology of interpersonal relationships*. New York: Wiley.
- Heinberg, L. J., & Thompson, J. K. (1995). Body image and televised images of thinness and attractiveness: A controlled laboratory investigation. *Journal of social and clinical psychology*, 14(4), 325-338.

- Himes, S. M., & Thompson, J. K. (2007). Fat stigmatization in television shows and movies: A content analysis. *Obesity, 15*(3), 712-718. doi:10.1038/oby.2007.635
- Hoffman, J. (Producer), & Chaykin, D. (Director). (2012). *The weight of the nation*. Available from <http://theweightofthenation.hbo.com/>
- Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the implicit association test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*(10), 1369-1385. doi:10.1177/0146167205275613
- Hunger, J. M., & Major, B. (2015). Weight stigma mediates the association between BMI and self-reported health. *Health Psychology, 34*(2), 172-175. doi:10.1037/hea0000106
- Inman, M. L., Huerta, J., & Oh, S. (1998). Perceiving discrimination: The role of prototypes and norm violation. *Social Cognition, 16*(4), 418-450.
- Jobsky, A. (2014). *The body-image meaning-transfer model: An investigation of the sociocultural impact on individuals' body-image*. DE: Anchor Academic Publishing.
- Karanović, J. (2014, February 18). Media and Cultural Analysis, Spring 2014. Retrieved July 07, 2018, from <http://www.karanovic.org/courses/mca008/archives/1084>
- Kim, S., & Anne Willis, L. (2007). Talking about obesity: News framing of who is responsible for causing and fixing the problem. *Journal of Health Communication, 12*(4), 359-376. doi:10.1080/10810730701326051
- Klein, H., & Shiffman, K. S. (2006). Messages about physical attractiveness in animated cartoons. *Body Image, 3*(4), 353-363. doi:10.1016/j.bodyim.2006.08.001

- Kosut, M. (Ed.). (2014). Cultivation theory. In *Encyclopedia of gender in media* (pp. 46-48). Retrieved from <https://ebookcentral.proquest.com/lib/eastcarolina/reader.action?docID=996572#>
- Kraus, A., & Myrick, J. G. (2018). Feeling bad about feel-good ads: The emotional and body-image ramifications of body-positive media. *Communication Research Reports*, 35(2), 101-111. doi:10.1080/08824096.2017.1383233
- Krugman, H. E. (1965). The impact of television advertising: Learning without involvement. *The Public Opinion Quarterly*, 29(3), 349-356. doi:10.1086/267335
- Latner, J. D., O'Brien, K. S., Durso, L. E., Brinkman, L. A., & MacDonald, T. (2008). Weighing obesity stigma: The relative strength of different forms of bias. *International Journal Of Obesity*, 32(7), 1145-1152. doi:10.1038/ijo.2008.53
- Lawrence, R. G. (2004). Framing obesity: The evolution of news discourse on a public health issue. *Harvard International Journal of Press/Politics*, 9(3), 56-75. doi:10.1177/1081180X04266581
- Lee, M., Ata, R. N., & Brannick, M. T. (2014). Malleability of weight-biased attitudes and beliefs: a meta-analysis of weight bias reduction interventions. *Body image*, 11(3), 251-259.
- Lent, M. R., Napolitano, M. A., Wood, G. C., Argyropoulos, G., Gerhard, G. S., Hayes, S., . . . Still, C. D. (2014). Internalized weight bias in weight-loss surgery patients: Psychosocial correlates and weight loss outcomes. *Obesity Surgery*, 24(12), 2195-2199. doi:10.1007/s11695-014-1455-z
- Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review Of Sociology*, 27, 363-385. doi:10.1146/annurev.soc.27.1.363

Major, B., Hunger, J. M., Bunyan, D. P., & Miller, C. T. (2014). The ironic effects of weight stigma. *Journal of Experimental Social Psychology, 51*, 74-80.

Maranto, C. L., & Stenoien, A. F. (2000). Weight discrimination: A multidisciplinary analysis. *Employee Responsibilities And Rights Journal, 12*(1), 9-24.

doi:10.1023/A:1007712500496

Martin, J. B. (2010). The development of ideal body image perceptions in the United States. *Nutrition Today, 45*(3), 98-110. doi:10.1097/NT.0b013e3181dec6a2

McClure, K. J., Puhl, R. M., & Heuer, C. A. (2011). Obesity in the news: Do photographic images of obese persons influence antifat attitudes?. *Journal Of Health Communication, 16*(4), 359-371. doi:10.1080/10810730.2010.535108

Murray, D. P. (2013). Branding "real" social change in Dove's campaign for real beauty. *Feminist Media Studies, 13*(1), 83.

National Heart, Lung, and Blood Institute (NHLBI). (2013). Why obesity is a health problem.

Accessed on July 4, 2018 from

<https://www.nhlbi.nih.gov/health/educational/wecan/healthy-weight-basics/obesity.htm>

O'Brien, K. S., Daniélsdóttir, S., Ólafsson, R. P., Hansdóttir, I., Fridjónsdóttir, T. G., & Jónsdóttir, H. (2013). The relationship between physical appearance concerns, disgust, and anti-fat prejudice. *Body Image, 10*(4), 619-623. doi:10.1016/j.bodyim.2013.07.012

O'Brien, K. S., Hunter, J. A., Halberstadt, J., & Anderson, J. (2007). Body image and explicit and implicit anti-fat attitudes: The mediating role of physical appearance comparisons. *Body Image, 4*(3), 249-256.

- O'Brien, K. S., Latner, J. D., Halberstad, J., Hunter, J. A., Anderson, J., & Caputi, P. (2008). Do antifat attitudes predict antifat behaviors?. *Obesity, 16*(suppl2), S87-S92.
doi:10.1038/oby.2008.456
- O'Brien, K. S., Puhl, R. M., Latner, J. D., Mir, A. S., & Hunter, J. A. (2010). Reducing anti-fat prejudice in preservice health students: A randomized trial. *Obesity, 18*, 2138–2144.
doi:10.1038/oby.2010.79
- Ogden C.L., Carroll M.D., Kit, B.K., Flegal, K.M. (2014). Prevalence of Childhood and Adult Obesity in the United States, 2011-2012. *JAMA: Journal of The American Medical Association, 311*(8), 806-814.
- O'Keefe, D.J. (2013). The elaboration likelihood model. In J.P. Dillard & L. Shen (Eds.), *The SAGE handbook of persuasion* (2nd ed., pp. 137-147). Retrieved from <https://ebookcentral.proquest.com/lib/eastcarolina/reader.action?docID=1995628>
- Pearl, R. L. (2018). Weight bias and stigma: Public health implications and structural solutions. *Social Issues And Policy Review, 12*(1), 146-182. doi:10.1111/sipr.12043
- Pearl, R. L., & Puhl, R. M. (2014). Measuring internalized weight attitudes across body weight categories: Validation of the Modified Weight Bias Internalization Scale. *Body image, 11*(1), 89-92.
- Pearl, R. L., & Puhl, R. M. (2016). The distinct effects of internalizing weight bias: An experimental study. *Body Image, 17*, 38-42. doi:10.1016/j.bodyim.2016.02.002
- Pearl, R. L., Puhl, R. M., & Brownell, K. D. (2012). Positive media portrayals of obese persons: Impact on attitudes and image preferences. *Health Psychology, 31*(6), 821–829.
- Pearl, R. L., Puhl, R. M., & Dovidio, J. F. (2015). Differential effects of weight bias experiences and internalization on exercise among women with overweight and obesity. *Journal of*

Health Psychology, 20(12), 1626-1632. doi:10.1177/1359105313520338

- Perri, M. G., & Corsica, J. A. (2002). Improving the Maintenance of Weight Lost in Behavioral Treatment of Obesity. In Wadden, A. T., & Stunkard, A. J. (Eds.), *Handbook of Obesity Treatment* (357-379). New York, NY: The Guilford Press.
- Pi-Sunyer, F. X. (1996). A review of long-term studies evaluating the efficacy of weight loss in ameliorating disorders associated with obesity. *Clinical Therapeutics*, 18(6), 1006–1035.
- Poustchi, Y., Saks, N. S., Piasecki, A. K., Hahn, K. A., & Ferrante, J. M. (2013). Brief intervention effective in reducing weight bias in medical students. *Family medicine*, 45(5), 345.
- Powell, A. D., & Kahn, A. S. (1995). Racial Differences in Women's Desires to Be Thin. *International Journal of Eating Disorders*, 17(2), 191–195. [https://doi-org.jproxy.lib.ecu.edu/10.1002/1098-108X\(199503\)17:2<191::AID-EAT2260170213>3.0.CO;2-Z](https://doi-org.jproxy.lib.ecu.edu/10.1002/1098-108X(199503)17:2<191::AID-EAT2260170213>3.0.CO;2-Z)
- Puhl, R. M., Andreyeva, T., & Brownell, K. D. (2008). Perceptions of weight discrimination: prevalence and comparison to race and gender discrimination in America. *International journal of obesity*, 32(6), 992.
- Puhl, R., & Brownell, K. D. (2001). Bias, discrimination, and obesity. *Obesity research*, 9(12), 788-805.
- Puhl, R. M., & Brownell, K. D. (2006). Confronting and coping with weight stigma: an investigation of overweight and obese adults. *Obesity*, 14(10), 1802-1815.
- Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: a review and update. *Obesity*, 17(5), 941-964.

- Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: important considerations for public health. *American journal of public health, 100*(6), 1019-1028.
- Puhl, R. M., Himmelstein, M., Gorin, A., & Suh, Y. (2017). Missing the target: Including perspectives of women with overweight and obesity to inform stigma-reduction strategies. *Obesity Science & Practice, 3*(1), 25–35.
- Puhl, R., Luedicke, J., & Peterson, J. L. (2013a). Public reactions to obesity-related health campaigns: a randomized controlled trial. *American journal of preventive medicine, 45*(1), 36-48.
- Puhl, R. M., Moss-Racusin, C. A., & Schwartz, M. B. (2007a). Internalization of weight bias: implications for binge eating and emotional well-being. *Obesity, 15*(1), 19-23.
- Puhl, R. M., Moss-Racusin, C. A., Schwartz, M. B., & Brownell, K. D. (2007b). Weight stigmatization and bias reduction: perspectives of overweight and obese adults. *Health education research, 23*(2), 347-358.
- Puhl, R. M., Neumark-Sztainer, D., Austin, S., Luedicke, J., & King, K. (2014). Setting policy priorities to address eating disorders and weight stigma: Views from the field of eating disorders and the US general public. *BMC Public Health, 14*, 524.
- Puhl, R., Peterson, J. L., & Luedicke, J. (2013b). Fighting obesity or obese persons? Public perceptions of obesity-related health messages. *International Journal of Obesity, 37*(6), 774.
- Puhl, R., & Suh, Y. (2015). Health consequences of weight stigma: implications for obesity prevention and treatment. *Current Obesity Reports, 4*(2), 182-190.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg self-esteem scale.

- Personality and Social Psychology Bulletin*, 27(2), 151-161.
doi:10.1177/0146167201272002
- Rosen, J. C. (1990). Body-image disturbances in eating disorders.
- Rosenberg, M. (1965). The measurement of self-esteem. *Society and the Adolescent Self Image*, 297-307.
- Rosenberg, M. (1979). *Conceiving the Self*. New York: Basic Books.
- Rudman, L. A., Feinberg, J., & Fairchild, K. (2002). Minority members' implicit attitudes: Automatic ingroup bias as a function of group status. *Social Cognition*, 20(4), 294-320.
doi:10.1521/soco.20.4.294.19908
- Sattler, K. M., Deane, F. P., Tapsell, L., & Kelly, P. J. (2018). Gender differences in the relationship of weight-based stigmatisation with motivation to exercise and physical activity in overweight individuals. *Health Psychology Open*, 5(1), 2055102918759691.
doi:10.1177/2055102918759691
- Schvey, N. A., Sbrocco, T., Bakalar, J. L., Ress, R., Barmine, M., Gorlick, J., ... Tanofsky-Kraff, M. (2017). The experience of weight stigma among gym members with overweight and obesity. *Stigma and Health*, 2(4), 292–306. <https://doi-org.jproxy.lib.ecu.edu/10.1037/sah0000062>
- Schwartz, M. B., Vartanian, L. R., Nosek, B. A., & Brownell, K. D. (2006). The influence of one's own body weight on implicit and explicit anti-fat bias. *Obesity*, 14(3), 440-447.
- Scott, J., & Cloud, N. E. (2008). Reaffirming the ideal: A focus group analysis of the campaign for real beauty. *Advertising & Society Review*, 9(4) doi:10.1353/asr.0.0012
- Seibert, R. G., Hanchate, A. D., Berz, J.P., & Schroy, P.C. (2017). National disparities in colorectal cancer screening among obese adults. *American Journal of Preventive*

- Medicine*, 53(2), e41-e49. doi:10.1016/j.amepre.2017.01.006
- Shanahan, J., Signorielli, N., & Morgan, M. (2014). Cultivation theory. In Thompson, T.L. (Ed.), *The encyclopedia of health communication* (pp. 276-277). Retrieved from <https://ebookcentral.proquest.com/lib/eastcarolina/reader.action?docID=1715009>
- Sheets, V., & Ajmere, K. (2005). Are romantic partners a source of college students' weight concern?. *Eating Behaviors*, 6(1), 1-9. doi:10.1016/j.eatbeh.2004.08.008
- Sigma Documentaries. (2016, February 28). *Denali National Park* [Video file]. Retrieved from https://www.youtube.com/watch?v=gs123AZ8i_k
- Spahlholz, J., Baer, N., Konig, H. H., Riedel-Heller, S. G., & Luck-Sikorski, C. (2016). Obesity and discrimination—A systematic review and meta-analysis of observational studies. *Obesity Reviews*, 17, 43–55.
- Strahan, E. J., Lafrance, A., Wilson, A. E., Ethier, N., Spencer, S. J., & Zanna, M. P. (2008). Victoria's dirty secret: How sociocultural norms influence adolescent girls and women. *Personality and Social Psychology Bulletin*, 34(2), 288-301. doi:10.1177/0146167207310457
- Sutin, A., Robinson, E., Daly, M., & Terracciano, A. (2016a). Weight discrimination and unhealthy eating-related behaviors. *Appetite*, 10283-89. doi:10.1016/j.appet.2016.02.016
- Sutin, A. R., Stephan, Y., Grzywacz, J. G., Robinson, E., Daly, M., & Terracciano, A. (2016b). Perceived weight discrimination, changes in health, and daily stressors. *Obesity*, 24(10), 2202-2209. doi:10.1002/oby.21598
- Sutin, A. R., & Terracciano, A. (2013). Perceived weight discrimination and obesity. *Plos ONE*, 8(7), doi:10.1371/journal.pone.0070048
- Swift, J. A., Tischler, V., Markham, S., Gunning, I., Glazebrook, C., Beer, C., & Puhl, R. (2013).

- Are anti-stigma films a useful strategy for reducing weight bias among trainee healthcare professionals? Results of a pilot randomized control trial. *Obesity Facts*, 6, 91–102.
10.1159/000348714
- Tajfel, H. (1974). Social identity and intergroup behaviour. *Information (International Social Science Council)*, 13(2), 65-93.
- Taylor, J., Johnston, J., & Whitehead, K. (2016). A corporation in feminist clothing? young women discuss the dove ‘Real beauty’ campaign. *Critical Sociology*, 42(1), 123-144.
doi:10.1177/0896920513501355
- Teachman, B. A., Gapinski, K. D., Brownell, K. D., Rawlins, M., & Jeyaram, S. (2003). Demonstrations of implicit anti-fat bias: The impact of providing causal information and evoking empathy. *Health Psychology*, 22, 68–78.
- Tiggemann, M., & Anesbury, T. (2000). Negative stereotyping of obesity in children: The role of controllability beliefs. *Journal of Applied Social Psychology*, 30(9), 1977-1993.
- Tomiyama, A. J. (2014). Weight stigma is stressful. A review of evidence for the Cyclic Obesity/Weight-Based Stigma model. *Appetite*, 82, 8-15.
- Turner, R. N., Wildschut, T., & Sedikides, C. (2012). Dropping the weight stigma: Nostalgia improves attitudes toward persons who are overweight. *Journal of Experimental Social Psychology*, 48(1), 130-137.
- TV Shows. (2018, April 18). *Victoria’s Secret Dream Angels Commercial 2018* [Video file].
https://www.youtube.com/watch?v=o_5FAgxX3Fw
- Vartanian, L. R., & Novak, S. A. (2011). Internalized societal attitudes moderate the impact of weight stigma on avoidance of exercise. *Obesity*, 19(4), 757-762.
doi:10.1038/oby.2010.234

- Wadden, T. A. (2006). The Look AHEAD Study: A Description of the Lifestyle Intervention and the Evidence Supporting It. *Obesity, 14*(5), 737-752.
- Wang, S. S., Brownell, K. D., & Wadden, T. A. (2004). The influence of the stigma of obesity on overweight individuals. *International Journal Of Obesity, 28*(10), 1333-1337.
doi:10.1038/sj.ijo.0802730
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal Of Personality And Social Psychology, 54*(6), 1063-1070. doi:10.1037/0022-3514.54.6.1063
- Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin, 98*(2), 219-235. doi:10.1037/0033-2909.98.2.219
- Wildschut, T., Sedikides, C., Routledge, C., Arndt, J., & Cordaro, P. (2010). Nostalgia as a repository of social connectedness: The role of attachment-related avoidance. *Journal of Personality and Social Psychology, 98*, 573–586.
- Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological review, 107*(1), 101.
- Wott, C. B., & Carels, R. A. (2010). Overt weight stigma, psychological distress and weight loss treatment outcomes. *Journal of health psychology, 15*(4), 608-614.
- Yamamiya, Y., Cash, T. F., Melnyk, S. E., Posavac, S. S., & Posavac, H. D. (2005). Women's exposure to thin-and-beautiful media images: Body image effects of media-ideal internalization and impact-reduction interventions. *Body Image, 2*(1), 74-80.
doi:10.1016/j.bodyim.2004.11.001
- Yeung, R. R. (1996). *The acute effects of exercise on mood state*. England: Elsevier Inc.
doi:10.1016/0022-3999(95)00554-4

Young, R., Subramanian, R., & Hinnant, A. (2016). Stigmatizing images in obesity health campaign messages and healthy behavioral intentions. *Health Education & Behavior*, 43(4), 412-419. doi:10.1177/1090198115604624

Table 1

Demographic Information by Condition

<u>Demographics</u>		<u>Aerie</u>	<u>Dove</u>	<u>HBO</u>	<u>VS</u>	<u>Control</u>
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)
<i>Underweight</i>	N (%)	2 (2.1)	4 (4.1)	6 (6.9)	4 (4.0)	6 (6.7)
<i>Normal Weight</i>	N (%)	58 (61.7)	53 (54.6)	48 (55.2)	68 (68.7)	54 (60.0)
<i>Overweight</i>	N (%)	22 (23.4)	26 (26.8)	23 (26.4)	11 (11.1)	17 (18.9)
<i>Obese</i>	N (%)	12 (12.8)	14 (14.4)	10 (11.5)	16 (16.2)	13 (14.4)
Ethnicity						
<i>Asian or Pacific Islander</i>	N (%)	5 (5.2)	7 (7.2)	2 (2.3)	3 (3.0)	6 (6.5)
<i>Black or African American</i>	N (%)	17 (17.5)	17 (17.5)	16 (18.2)	18 (17.8)	21 (22.8)
<i>Hispanic or Latino</i>	N (%)	10 (10.3)	6 (6.2)	4 (4.5)	6 (5.9)	4 (4.3)
<i>White</i>	N (%)	63 (64.9)	64 (66.0)	61 (69.3)	70 (69.3)	56 (60.9)
<i>Other</i>	N (%)	2 (2.1)	3 (3.1)	5 (5.7)	4 (4.0)	5 (5.4)
Weight Loss History						
<i>Yes</i>	N (%)	69 (71.1)	65 (67.0)	52 (59.1)	68 (67.3)	64 (69.6)
<i>No</i>	N (%)	28 (28.9)	32 (33.0)	36 (40.9)	33 (32.7)	28 (30.4)
Eating/Exercise Disorder History						
<i>Yes</i>	N (%)	8 (8.2)	6 (6.2)	5 (5.7)	4 (4.0)	8 (8.7)
<i>No</i>	N (%)	89 (91.8)	91 (93.8)	83 (94.3)	97 (96.0)	84 (91.3)
Current Physical Activity Routine						
<i>Yes</i>	N (%)	49 (50.5)	55 (56.7)	53 (60.2)	51 (50.5)	52 (56.5)
<i>No</i>	N (%)	48 (49.5)	42 (43.3)	35 (39.8)	50 (49.5)	40 (43.5)

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

Table 2

Baseline Variable Means (Standard Deviations) by Demographic Categories

<u>Demographics</u>	<u>AFA-T</u>	<u>AFA-D</u>	<u>AFA-F</u>	<u>AFA-W</u>	<u>WBIS</u>	<u>RSES</u>	<u>BISS</u>	<u>PAS</u>	<u>NAS</u>
BMI									
<i>Underweight</i>	3.01 (1.42) ^A	2.10 (1.34) ^{AB}	3.65 (2.79) ^A	4.52 (2.15) ^A	1.86 (.70)	19.36 (6.76) ^A	4.96 (.52) ^{AB}	26.00 (6.10)	19.73 (7.70) ^A
<i>Normal Weight</i>	3.18 (1.35) ^A	1.99 (1.11) ^A	4.93 (2.58) ^A	4.19 (2.13) ^A	2.52 (1.20)	20.33 (5.58) ^A	4.88 (.72) ^A	27.37 (8.49) ^A	16.89 (6.12) ^A
<i>Overweight</i>	3.05 (1.10) ^A	1.67 (.73) ^{BC}	5.55 (2.32) ^B	3.50 (1.51) ^A	3.50 (1.51)	19.63 (5.50) ^A	4.69 (.66) ^B	28.56 (8.32) ^B	16.91 (6.49) ^A
<i>Obese</i>	3.09 (.94) ^A	1.60 (.70) ^C	6.01 (2.29) ^B	4.40 (1.49) ^A	4.40 (1.49)	18.55 (5.95) ^A	4.37 (.85)	25.11 (7.22) ^{AB}	17.71 (6.77) ^A
Ethnicity									
<i>Asian or Pacific Islander</i>	3.20 (1.18) ^{AC}	1.75 (1.08) ^A	5.71 (2.48) ^A	4.07 (1.83) ^A	2.65 (1.42) ^A	19.48 (5.27) ^A	4.66 (1.00) ^A	24.04 (6.72) ^A	16.13 (7.19) ^A
<i>Black or African American</i>	2.88 (1.04) ^A	1.74 (.84) ^A	4.69 (2.63) ^A	3.73 (1.94) ^A	2.88 (1.54) ^A	21.61 (5.85) ^A	4.69 (.76) ^A	28.71 (7.77) ^A	16.02 (5.25) ^A
<i>Hispanic or Latino</i>	3.04 (1.20) ^{BC}	1.81 (1.02) ^A	5.40 (2.29) ^A	3.54 (2.12) ^A	3.45 (1.70) ^A	17.97 (6.35) ^A	4.73 (.59) ^A	26.33 (9.17) ^A	17.47 (6.37) ^A
<i>White</i>	3.23 (1.30) ^{BC}	1.92 (1.07) ^A	5.27 (2.52) ^A	4.22 (2.12) ^A	2.93 (1.44) ^A	19.59 (5.48) ^A	4.81 (.72) ^A	27.33 (8.29) ^A	17.43 (6.62) ^A
<i>Other</i>	3.00 (1.33) ^{AC}	1.92 (.93) ^A	4.72 (2.74) ^A	3.79 (1.98) ^A	3.25 (1.52) ^A	19.74 (6.69) ^A	4.77 (.72) ^A	24.68 (9.71) ^A	18.74 (5.68) ^A
Weight Loss History									
<i>Yes</i>	3.34 (1.21)	1.89 (1.06) ^A	5.83 (2.32)	4.22 (2.02)	3.37 (1.51)	19.17 (5.72)	4.66 (.76)	27.31 (8.36) ^A	17.81 (6.79)
<i>No</i>	2.74 (1.22)	1.84 (.93) ^A	3.83 (2.44)	3.74 (2.15)	2.11 (.96)	21.28 (5.41)	5.01 (.61)	27.17 (8.16) ^A	15.82 (5.19)
Eating/Exercise Disorder History									
<i>Yes</i>	3.77 (1.18)	1.99 (1.13) ^A	7.40 (1.77)	4.31 (2.15) ^A	4.57 (1.49)	14.84 (5.56)	4.41 (.89)	24.97 (7.60) ^A	21.45 (8.22)
<i>No</i>	3.09 (1.24)	1.87 (1.01) ^A	5.01 (2.52)	4.04 (2.07) ^A	2.84 (1.41)	20.22 (5.55)	4.80 (.71)	27.42 (8.32) ^A	16.86 (6.12)
Current Physical Activity Routine									
<i>Yes</i>	3.36 (1.33)	1.98 (1.15)	5.63 (2.48)	4.29 (2.14)	2.96 (1.44) ^A	20.13 (5.54) ^A	4.74 (.70) ^A	28.71 (8.31)	17.10 (6.46) ^A
<i>No</i>	2.88 (1.09)	1.74 (.81)	4.61 (2.51)	3.78 (1.96)	2.95 (1.53) ^A	19.55 (5.89) ^A	4.82 (.77) ^A	25.51 (7.93)	17.22 (6.28) ^A

Notes. AFA-T = AFA-Total, AFA-D = AFA-Dislike, AFA-F = AFA-Fear of Fat, AFA-W = AFA-Willpower. Values that share a superscript letter in the same column are statistically equivalent to each other at the .05 level within each section of demographics.

Table 3

Correlations Between Outcome Variables at Baseline ($N = 475$)

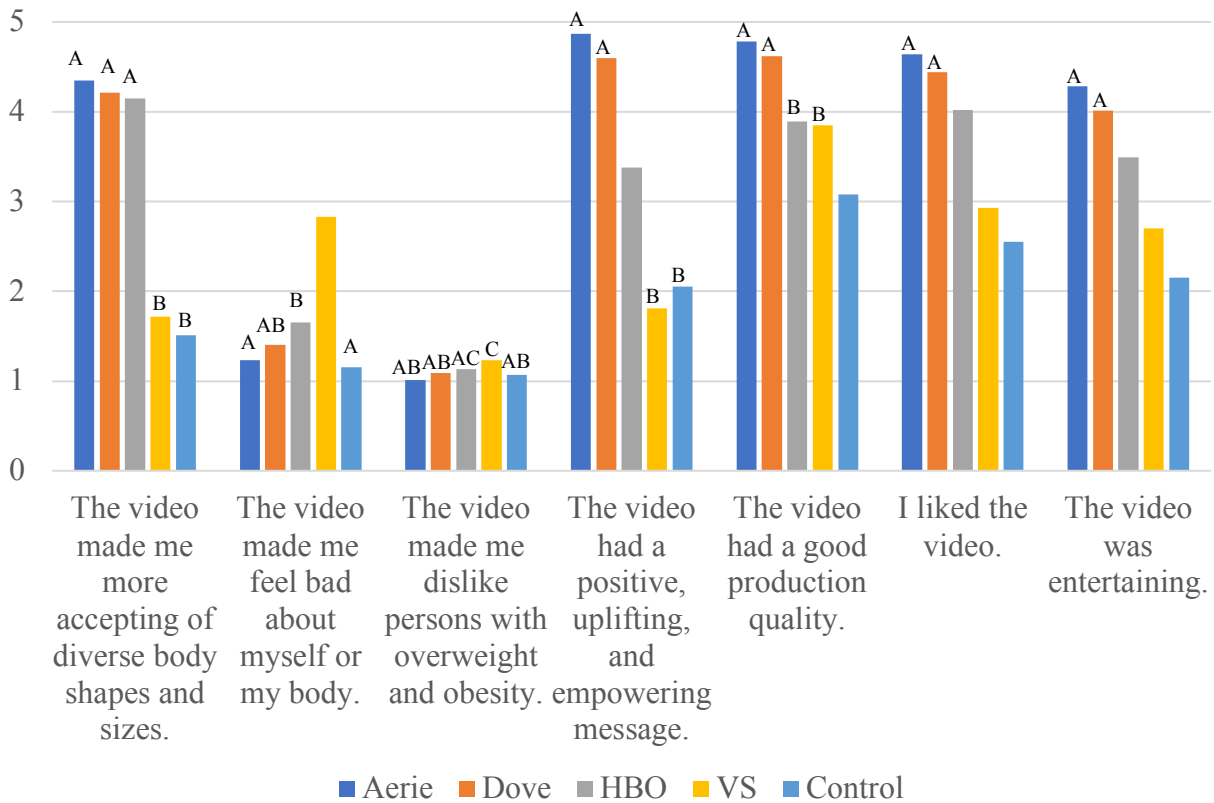
Variables	1	2	3	4	5	6	7	8	9
1 AFA-Total	--								
2 AFA-Dislike	.77***	--							
3 AFA-Fear	.76***	.30***	--						
4 AFA-Willpower	.79***	.50***	.40***	--					
5 WBIS	.31***	0.03	.54***	.11*	--				
6 RSES	-.18***	-0.04	-.32***	-.04	-.58***	--			
7 BISS	-.16**	-.04	-.26***	-.04	-.27***	.11*	--		
8 PAS	-0.01	0.01	-0.08	0.04	-0.20***	.42***	0.02	--	
9 NAS	.15**	0.04	.21***	0.08	.32***	-.44***	-.14**	-0.08	--

Notes. Antifat Attitudes total scores (AFA-Total), Antifat Attitudes-Dislike subscale (AFA-Dislike), Antifat Attitudes-Fear of Fat subscale (AFA-Fear), Weight Bias Internalization Scale (WBIS), Rosenberg Self-Esteem Scale (RSES), Body Image States Scale (BISS), Positive Affect Scale (PAS), and Negative Affect Scale (NAS).

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

Figure 1

Average Response Ratings to Video Reaction Statements by Condition



Notes. 1 = Very False, 2 = Somewhat False, 3 = Neutral, 4 = Somewhat True, and 5 = Very True. Bars sharing letters for the same statement are statistically equivalent to each other at the .05 level. See Table 4 for means and standard deviations. See text for *F* statistics.

Table 4

Average Response Ratings to Video Reaction Statements by Condition

Statement	Aerie		Dove		HBO		VS		Control		Overall Sample	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
The video made me more accepting of diverse body shapes and sizes.	4.35 ^A	1.00	4.21 ^A	0.95	4.15 ^A	1.01	1.72 ^B	1.09	1.51 ^B	0.98	3.17	1.63
The video made me feel bad about myself or my body.	1.23 ^A	0.73	1.40 ^{AB}	0.93	1.65 ^B	1.06	2.83	1.28	1.15 ^A	0.55	1.67	1.14
The video made me dislike persons with overweight and obesity.	1.01 ^{AB}	0.10	1.09 ^{AB}	0.48	1.13 ^{AC}	0.48	1.23 ^C	0.62	1.07 ^{AB}	0.29	1.11	.44
The video had a positive, uplifting, and empowering message.	4.87 ^A	0.42	4.60 ^A	0.92	3.38	1.28	1.81 ^B	1.05	2.05 ^B	1.11	3.34	1.61
The video had a good production quality.	4.78 ^A	0.56	4.62 ^A	0.59	3.89	1.04	3.85	1.16	3.08	0.98	4.05	1.16
I liked the video.	4.64 ^A	0.70	4.44 ^A	0.85	4.02	1.12	2.93	1.19	2.55	1.26	3.37	1.33
The video was entertaining.	4.28 ^A	0.97	4.01 ^A	1.07	3.49	1.24	2.70	1.33	2.15	1.15	3.33	1.40

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 equivalent to each other at the .05 level (overall sample column excluded from between-group comparisons). See text for *F* statistics.

Table 5

Average Pre-Post Scores by Condition and Total Sample

Variable	Aerie		Dove		HBO		VS		Control		Overall Sample	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
AFA-Total	3.24 (1.33)	2.84 (1.30)	3.08 (1.24)	2.97 (1.20)	3.37 (1.29)	3.17 (1.35)	3.04 (1.11)	2.91 (1.20)	2.99 (1.25)	2.86 (1.21)	3.14 (1.25)	2.95 (1.25)
AFA-Dislike	2.01 (1.17)	1.81 (1.18)	1.77 (.99)	1.82 (1.18)	2.06 (1.14)	1.95 (1.23)	1.75 (.86)	1.86 (1.11)	1.80 (.88)	1.79 (.92)	1.87 (1.02)	1.84 (1.13)
AFA-Fear	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)	5.17 (2.54)	4.76 (2.52)
AFA-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)	4.06 (2.07)	3.70 (1.96)
WBIS	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)	2.96 (1.48)	2.88 (1.45)
RSES	19.51 (5.47)	20.50 (5.77)	19.34 (5.76)	20.57 (5.72)	20.24 (5.93)	20.95 (5.38)	19.97 (5.63)	19.90 (5.50)	20.33 (5.80)	20.27 (5.87)	19.87 (5.70)	20.43 (5.64)
BISS	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)	4.78 (.73)	4.84 (.63)
PAS	27.12 (8.84)	31.75 (8.50)	26.35 (8.07)	27.95 (8.23)	27.89 (8.34)	26.57 (8.06)	28.26 (7.97)	23.63 (8.29)	26.67 (8.21)	21.64 (8.51)	27.26 (8.29)	26.33 (9.00)
NAS	17.26 (6.14)	13.84 (5.03)	16.69 (6.15)	14.68 (5.47)	17.55 (6.26)	17.02 (5.82)	17.40 (6.71)	14.76 (5.59)	16.90 (6.66)	13.52 (4.51)	17.16 (6.37)	14.73 (5.42)

Notes. Bolded M(SD) pre-post pairs are significantly different from each other at the .05 level.

See text for *t* statistics (except for overall sample means).

Variable score ranges: AFA: 0-9 (higher score = greater weight bias), WBIS: 1-7 (higher scores = greater IWB), RSES: 0-30 (higher scores = greater self-esteem), BISS: 1-9 (higher scores = more positive body image), PAS/NAS: 10-50 (higher scores = more positive/negative affect).

Appendix A: IRB Approval Letter



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-
2284 · www.ecu.edu/ORIC/irb

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: [Jennifer Selensky](#)
CC: [Robert Carels](#)
Date: 10/29/2018
Re: [UMCIRB 18-002159](#)
Weight Bias Reduction Intervention

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) is for the period of 10/29/2018 to 10/28/2019. The research study is eligible for review under expedited category #7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Name	Description
Appendix A - Demographics.docx	Surveys and Questionnaires
Appendix B - Video Specific Questions.docx	Surveys and Questionnaires

Appendix C - AFA.docx
Appendix D - WBIS-M.docx
Appendix E - RSES.docx
Appendix F - BISS.docx
Appendix G - PANAS.docx
Debriefing Statement.docx
Dissertation Proposal
Media Materials.docx
Survey Research Consent Letter

Surveys and Questionnaires
Surveys and Questionnaires
Surveys and Questionnaires
Surveys and Questionnaires
Surveys and Questionnaires
Debriefing Statement
Study Protocol or Grant Application
Additional Items
Consent Forms

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

