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INVESTIGATING THE PRESENCE AND CORRELATES OF ANTI-THIN BIAS IN
ADULTS

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
at Virginia Commonwealth University.

by

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AbstractINVESTIGATING THE PRESENCE AND CORRELATES OF ANTI-THIN BIAS IN
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Virginia Commonwealth University, 2018

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Weight stigma is associated with negative health outcomes across the BMI continuum. However, few studies have examined weight discrimination targeting people with low body weights. This investigation explored the presence of anti-thin bias, defined as the belief that people with low BMIs have undesirable personality characteristics. Participants were randomly assigned to read one of six vignettes about women that differed by race (White and Black) and weight status (slightly underweight, normal weight, and slightly overweight). Negative personality characteristics were more likely to be ascribed to both underweight and overweight women, compared with normal weight women. Furthermore, participants were significantly more likely to attribute underweight women's body weight to biological factors. Results indicate that underweight women might be more stigmatized for their body weight than normal weight women. Weight bias literature should continue to research the impact of weight discrimination for individuals across the BMI spectrum.

Keywords: underweight, stigma, attributions, social comparison

Overview

Extensive research documents the presence of weight bias, defined as harmful weight-based stereotypes or discrimination, against individuals who are overweight or obese (Brownell, 2005). Although less frequently investigated, anti-thin bias is also evident in multiple studies (McDonnell & Lin, 2016; Neumark-Sztainer et al., 2002; Tantleff-Dunn, Hayes, & Braun, 2009). For example, Cramer and Steinwert (1998) found (using picture and story prompts) that both average weight and underweight preschoolers were more likely to want to play with an average weight peer rather than one who is either underweight or overweight. In the same study, 5-year-olds were more likely to assign negative adjectives to a picture of an underweight child than to a picture of an average weight child (Cramer & Steinwert, 1998). This research suggests that even very young children display stigmatizing attitudes about both overweight and underweight peers.

Both genes and environment determine body weight (Dubois et al., 2012; Grilo, & Pogue-Geile, 1991; Puhl & Brownell, 2001). Consequently, weight change is often quite difficult (Fairburn & Brownell, 2001). However, many believe weight gain or loss is controllable by willpower (Fairburn & Brownell, 2001; Puhl, & Brownell, 2001). Public health efforts reflect these attitudes and oversimplify the difficulty of changing body weight. For example, the U.S. Department of Health and Human Services launched its “Small Steps” campaign in 2004, which attempts to “use humor to inspire overweight adults to incorporate ‘Small Steps’ into their hectic lives.” Critics complain that these efforts are ineffective in creating behavior change because they largely attribute body weight to personal failings (Stein, 2008). Furthermore, in 2008, a Mississippi State House Bill proposed that restaurants stop serving food to people with obesity (Pomeranz, 2008). These public health efforts encourage stigmatization of body weight as a way to produce health behavior change despite a lack of any evidence suggesting that this

stigmatization yields change (Simpson, Griffin, & Mazzeo, 2017; Young, Subramanian, & Hinnant, 2016), as well as criticism from experts (Puhl & Heuer, 2010). A meta-analysis of public health campaigns revealed that the most effective campaigns offer realistic solutions (Witte & Allen, 2000). However, people with obesity thought that most public health campaigns did not offer practical recommendations (Lewis et al., 2010). Therefore, these public health strategies might inadvertently trigger maladaptive coping responses rather than result in long term behavioral change (Hastings, Stead, & Webb, 2004).

Although many health advertisements stigmatize overweight and obese people, there are also efforts to ban advertisements of people considered “too thin.” France passed legislation in 2015, for example, that requires fashion models to have a body mass index (BMI) of at least 18 and provide a doctor’s note to confirm their good health (Model Health Law, 2015). Another example occurred in 2016 when London’s mayor, Sadiq Khan, announced a ban on advertisements that promote “unhealthy and unrealistic body images” (Transport for London Advertising Policy, 2016). Although exposure to media images of thin models is positively linked to body dissatisfaction and disordered eating, these laws have garnered criticism (for meta-analyses, see Grabe et al., 2008 and Groesz, Levine, & Murnen, 2002). For example, France’s National Union of Modeling Agencies released a statement that BMI should not be the only consideration for models’ health because some people are naturally thin (McNicoll, 2015; Steinberg & Jotkowitz, 2017). Research demonstrates thinness has a similar genetic contribution as obesity (Bulik & Allison, 2001). Thus, fashion models might have difficulty gaining weight. Additionally, Claire Mysko, chief executive officer of the National Eating Disorders Association, worries the law simplifies eating disorders by only considering body weight, which could lead to

an under-diagnosis of eating disorders in individuals whose weight is in normal or overweight ranges (Friedman, 2016).

A better strategy to promote positive body image might be to expose people to a variety of body types rather than placing BMI limitations on models (Tylka & Iannantuono, 2016; Rodgers, Ziff, Lowy, Yu, & Austin, 2017). The ability to conceptualize beauty broadly is a positive body image construct, defined as the capability to consider a variety of appearances, body shapes, and inner characteristics beautiful. In addition, a broad conceptualization of beauty is linked to higher levels of self-compassion and lower levels of anti-fat attitudes, body surveillance, and social comparison (Tylka & Iannantuono, 2016).

Thin Ideal

Western beauty ideals have changed over time. During the 1950s, the media popularized an hourglass figure epitomized by such cultural icons as Marilyn Monroe. This ideal shifted to a thinner frame in the 1960s, with the introduction of more angular models such as Twiggy. Consistent with this shift, the marketing of diet and weight loss products in popular women's magazines increased (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999).

A recent meta-analysis found that thinness-oriented body dissatisfaction decreased over the past 31 years, which could reflect another transition in appearance-related ideals (Karazsia, Murnen, & Tylka, 2016). Recent body image research suggests beauty ideals for women are shifting from a very thin frame to a thin, but toned, muscular frame (Boepple & Thompson, 2014; Simpson & Mazzeo, 2016; Webb, Vinoski, Warren-Findlow, Burrell, & Putz, 2017). Thus, it could be that being thin is no longer enough in Western society; rather, women must be both thin and athletic (Simpson & Mazzeo, 2017). This new body image ideal is known as "fitspiration" (a combination of the words *fitness* and *inspiration*, Abena, 2013). Although this

could be seen as somewhat positive, as extreme thinness is perhaps not the only body ideal, research suggests the thin and muscular ideal is also potentially problematic. For example, an experimental investigation found that women exposed to thin, muscular models reported decreases in body satisfaction comparable to that reported by women exposed to thin, non-muscular models (Benton & Karazsia, 2015). Another study found that women exposed to a thin, athletic model manifested decreases in body satisfaction, whereas women exposed to a normal weight, athletic model did not have similar decreases (Homan et al., 2011). These results suggest body image ideals are evolving from an ultrathin frame to a thin, muscular frame, and these changes are not a panacea for reducing body dissatisfaction.

Furthermore, research suggests that men find women with weights in the “normal” range more attractive than women with weights in the “underweight” range. Studies investigating links among sexual desirability, BMI, and dress size, note that women with weights classified as either “underweight” or “low normal weight” are considered less attractive by men, compared with women with weights in the “normal” range (BMI > 19, Tovée, Reinhardt, Emery, & Cornelissen, 1998; Cundall & Guo, 2015; Swami, & Tovée, 2005). These results suggest that the thin, emaciated body type might no longer be the standard of beauty in Westernized cultures. This, in turn, could lead to more stigmatization of very thin individuals. Although this new body ideal might seem less harmful than the ultra-slim images of models, it still emphasizes physical activity for appearance-related motives, which is itself related to increased body dissatisfaction, low self-esteem, and disordered eating (Goncalves & Gomes, 2012). Moreover, the thin and toned body type is unattainable for most women unless they exercise excessively (Krane, Stiles-Shipley, Waldron, & Michalenok, 2001; Tiggemann & Zaccardo, 2015). For example, one study found that women who posted fitspiration images on Instagram scored significantly higher on

measures of disordered eating, drive for muscularity, and compulsive exercise than women who posted travel images on Instagram (Holland & Tiggemann, 2017). Although physical activity is beneficial for health, excessive exercise and exercise dependence, are associated with fatigue, injury proneness, and social withdrawal (Bamber, Cockerill, Rodgers, & Carroll, 2003; U.S. Department of Health and Human Services [HHS], 2000).

Weight Stigma

Weight stigma is defined as negative attitudes or stereotypes about individuals due to their weight (Puhl & Heuer, 2009). This form of stigma is experienced through discriminatory behaviors (e.g. an employer is less likely to promote an overweight person) or through internalized attitudes (i.e. people apply these negative stereotypes to themselves, Puhl & Heuer, 2009). Weight stigma is extremely common, and research suggests that health professionals are not immune to this bias. Indeed, health professionals obtained similar scores on both explicit and implicit measures of weight bias (Sabin, Marini, Nosek, & Fielding 2012; Tomiyama et al., 2015). These results, as well as those of several other studies (Latner & Stunkard, 2003; Phelan et al., 2014; Teachman & Brownell, 2001), suggest weight stigma is more socially acceptable than other forms of prejudicial attitudes, as evidenced by people's willingness to admit explicit anti-fat attitudes.

In a cross-sectional study of adults, women reported that they experience weight discrimination more frequently than racial discrimination (Puhl, Andreyeva, & Brownell, 2008). Furthermore, weight discrimination was more commonly reported than prejudice based on sexual orientation, religious beliefs, ethnicity, and physical disability across genders (Puhl et al., 2008). Thus, weight discrimination is widespread. Although people with higher BMIs are more likely to experience weight stigma (Puhl & Heuer, 2009), it is also reported by individuals with BMIs in

the underweight range (Neumark-Sztainer et al., 2002). Additionally, weight stigma has a greater influence on negative outcomes than one's actual body weight (Sutin, Robinson, Daly, & Terracciano, 2016; Wott & Carels, 2010). People across weight categories who experienced weight discrimination, for example, were more likely to overeat and consume convenience foods, and less likely to have a regular meal pattern (Sutin et al., 2016). Perceived weight discrimination is also related to higher depression (Wott & Carels, 2010), weight gain (Tomiyama, 2014), and cortisol activity (Schvey, Puhl, Brownell, 2014) in both people with "normal" range weights and those with overweight and obesity. These results highlight the need for additional research investigating weight stigma across weight statuses.

Weight-related teasing.

Weight-related teasing, defined as name-calling or verbally mocking someone's weight, is a form of weight stigma (Puhl & Heuer, 2009). In a cross-sectional study with adolescents ages 12-18, both youth with BMIs in the overweight range, and those in the underweight range, experienced weight-related teasing more frequently than peers in the normal weight range (Neumark-Sztainer et al., 2002). Youth with overweight BMIs reported being more bothered by weight-related teasing compared with those with BMIs categorized as underweight. However, 54.6% of youth with BMIs defined as underweight reported being upset by the teasing. There was not a statistically significant difference in frequency of weight-related teasing experienced by girls and boys in the underweight category, but girls in this group were more likely to be bothered by the teasing than boys. Adolescents teased about their weight were also significantly more likely to engage in disordered eating behaviors regardless of their weight status (Neumark-Sztainer et al., 2002). This finding is consistent with past research. Among adolescent girls, weight/shape related teasing was strongly associated with disordered eating (Levine, Smolak,

Hayden, 1994). Weight teasing also was linked to body dissatisfaction and disordered eating in college women (Annus et al., 2007; Stromer & Thompson, 1996).

Moreover, frequent teasing about weight is associated with higher depressive symptoms, body dissatisfaction, and suicidal ideation, and lower self-esteem among adolescents independent of weight, race, or ethnicity (Eisenberg, Neumark-Sztainer, & Story, 2003; Fabian & Thompson, 1989; Grilo et al., 1994). In a cross-sectional study of adolescents ages 12-18, weight-related teasing more strongly influenced adverse health outcomes than actual body weight, regardless of gender or race/ethnicity (Eisenberg et al., 2003). This study demonstrates the importance of examining weight stigma across weight categories.

Some research suggests that children and adolescents with weights in the underweight range might face increased risk for body image concerns and lower physical activity compared with their peers with weights in the normal range (Eisenberg et al., 2003; O'Dea & Amy, 2011). For example, a cross-sectional study of youth ages 6-18 found that 41.3% of those with weights classified as "thin" reported that their parents and peers told them that they did not eat enough (O'Dea & Amy, 2011). These youths were significantly less likely than their peers with normal weights to consider themselves at an ideal weight, and 53.9% of them reported wanting to gain weight. Thin youths were also less likely to be encouraged to exercise than youths at other weights (O'Dea & Amy, 2011), which is problematic because physical activity is positively associated with self-esteem (Davison & Schmalz, 2006; Dishman et al., 2006), perceived quality of life (Shoup et al., 2008), academic performance (Singh et al., 2012), and physical health (HHS, 2000), and negatively associated with body dissatisfaction (Slater & Tiggemann, 2006).

Youth with underweight also report having less confidence in their educational abilities, and experiencing more adverse social outcomes than their normal weight peers (Cramer &

Steinwert, 1998; Falkner et al., 2001). In a cross-sectional study of 7th, 9th, and 11th grade students, boys with underweight were significantly more likely to report disliking school and experiencing serious emotional problems than boys with average weights (Falkner et al., 2001). Both underweight girls and boys were more likely to report their friends did not care about them, and these youths felt they were less likely to complete college compared to their peers with weights in the normal range (Falkner et al., 2001). This is problematic because higher social support is related to lower body dissatisfaction and less disordered eating in adolescents (Kirsch, Shapiro, Conley, & Heinrichs, 2016), decreased risk of mortality and morbidity (Holt-Lunstad, Smith, & Layton, 2010), and better immune and cardiovascular health in adults (Uchino, 2006).

Although much of the literature on weight-related teasing has focused on children, evidence indicates that weight-related teasing and discrimination continue into adulthood. In a study of undergraduates, students were just as likely to be teased for being underweight as they were for being overweight, regardless of gender (Tantleff-Dunn et al., 2009). Indeed, 12% of participants said they experienced discrimination for being underweight, and 24% of overweight individuals reported weight-based discrimination. These results contradict the idea of “weight halo” effects, which is the notion that society perceives thin people as more attractive and successful, and in turn treats them more favorably (Wade & Dimaria, 2003).

Anti-Thin Bias

Despite evidence indicating that individuals with underweight BMIs are teased about their weight more often than individuals with normal weight BMIs, few studies have explored anti-thin bias. The idea of anti-thin bias is counterintuitive because Western culture tends to idealize thin bodies, so one would assume that thin people are considered more attractive (Thompson et al., 1999). In addition, people consider more attractive individuals to have more

desirable personality traits (Dion, Berscheid, & Walster, 1972; see Hosoda, Stone, Romero, & Coats, 2003 for a meta-analysis). Because thin people have achieved a cultural body ideal, one might think that they receive more favorable treatment. However, research finds that anti-attractiveness biases occur in same-sex people. For example, Agthe, Spörrle, and Maner (2010) found that participants were less likely to offer a job to an attractive same-sex candidate. Thus, preference for attractive people in organizational situations usually occurs in opposite-sex situations (Agthe et al., 2010; Agthe, Spörrle, & Maner 2011; Johnson, Podratz, Dipboye, & Gibbons, 2010). One explanation for this phenomenon could be that people feel threatened by same-sex attractive peers and will therefore treat them less favorably (Agthe et al., 2011). Therefore, embodying cultural beauty ideals could have a negative impact in certain situations, and thin people might be met with jealousy by same-sex peers.

Moreover, because thinness is idealized in Western culture, thin people might receive unwanted attention. This hypothesis was evaluated in a qualitative study conducted with fourteen thin women and four thin men (Beggan & DeAngelis, 2015). They found that the majority reported hearing comments about their weight often and usually perceived these comments negatively (Beggan & DeAngelis, 2015). Respondents further reported feeling that even positive comments about their weight were motivated by envy. Moreover, they considered weight-related comments intrusive at times (Beggan & DeAngelis, 2015).

A content analysis of weight and appearance photo captions in celebrity gossip magazines offered further support for the theory that thin people might be judged negatively because others resent them for attaining a cultural ideal (McDonnell & Lin, 2016). Specifically, female celebrities classified as underweight were significantly more likely to receive criticism about their appearance than those classified as overweight or normal weight (McDonnell & Lin,

2016). The authors propose that these critical comments suggest the ideal body type is shifting from very thin to one of being both thin and muscular. They also suggest that thin women might experience more weight shaming because critical comments about underweight women could alleviate body dissatisfaction in female readers who likely cannot realistically or healthfully attain this body type (Alicke, 2010; Ford, Maynard, & Li, 2014; McDonnell & Lin, 2016).

Evidence that Western body ideals are shifting to a more athletic image continues to accumulate (Boepple & Thompson, 2014; Karazsia et al., 2016; Simpson & Mazzeo, 2016; Webb et al., 2017). For example, Swami et al. (2008) found that both photographs of underweight (BMI < 18.5) and low average weight individuals (BMI < 19 for women and BMI < 21 for men) were ranked by an undergraduate sample as lonelier, more likely to get teased, and less attractive than photographs of people in the middle-average weight category (BMI of 19-20 for women and 21-22 for men). These results suggest that even individuals on the low end of the normal BMI range can be perceived negatively.

Degree of weight stigma often differs based on people's attributions of the etiology of body weight (Blaine & Williams, 2004; Puhl et al., 2005; Teachman et al., 2003). Only one study has investigated weight stigma across weight categories. Allison and Lee (2015) exposed each participant to one of six vignettes that differed by body size (underweight, average weight, and overweight) and information on weight controllability (no information vs. uncontrollable weight due to a medical disorder). The uncontrollable weight condition included three metabolic disorders: hyperthyroidism, G6PD deficiency, and hypothyroidism. Interestingly, the authors found that the underweight target whose weight was attributed to hyperthyroidism received less favorable ratings than the underweight target whose weight was not due to a medical condition. However, this result could be due to the measure for personality assessment, which included only

six adjectives: attractive, healthy, likeable, motivated, self-disciplined, and having willpower. Ratings on these personality dimensions were added to yield an overall personality rating. (A higher sum was considered a more favorable rating). The target described as underweight due to a non-medical condition received higher ratings on self-discipline, motivation, and willpower, which likely resulted in a higher overall rating. The researchers did not find differences in likeability ratings between the average weight and underweight targets, which suggests that anti-thin bias was not evident in this sample (Allison & Lee, 2015).

In another investigation of the potential link between attributions of body weight and perceptions of underweight individuals, Tantleff-Dunn, Hayes, and Braun (2009) presented a sample of college students with one of three vignettes that described a woman as underweight due to an eating disorder, underweight due to heredity, or underweight due to cancer treatments. The target whose weight was attributed to an eating disorder was perceived most negatively on personality measures. However, the target whose underweight status was described as hereditary was viewed as more depressed, conforming, and insecure, and lower in self-esteem compared with the target described as underweight due to cancer treatments. Respondents were also most likely to report that the underweight woman in the hereditary condition under-ate and disliked food (Tantleff-Dunn et al., 2009). These results suggest the possibility that people might attribute a thin person's weight to eating disorder symptomatology (e.g., restraint) despite contrary evidence. This is problematic because eating disorders are highly stigmatized. Studies demonstrate that people consider those with eating disorders to have more negative personality characteristics and to be more responsible for their illness than people with other mental health issues, including depression (O'Connor, O'Hara, McNamara, & McNicholas, 2015),

schizophrenia (Stewart, Keel, & Schiavo, 2006), and substance abuse (Yu, Hildebrandt, & Lanzieri, 2015).

Anti-thin bias and ethnicity.

Given cultural differences in body ideals, it is possible that weight stigma differs across racial/ethnic groups. Research suggests Black women tend to idealize curvier body types that are discrepant from the thin-ideal endorsed in Eurocentric media (Aruguete, Nickleberry, & Yates, 2004; Gordon et al., 2010). Some Black women consider thinness to be a body ideal more appropriate for White women, and view thick/toned/curvy bodies as more ideal for Black women (Awad et al., 2015). This racial difference in ideals is evident from a young age. For instance, 66% of Black mothers with children who are overweight reported being satisfied with their child's weight or wanted their child to be heavier (Killon et al., 2006). Additionally, Black parents from lower socioeconomic groups were significantly more likely than White and Hispanic parents from lower socioeconomic groups to consider children with weights in the overweight range to be healthy (Sherry et al., 2004). This sociocultural ideal is problematic because childhood overweight/obesity is associated with numerous negative outcomes over time, including a higher likelihood of diabetes, cardiovascular risk factors, and premature mortality (for full review of the literature, see Reilly et al., 2003).

Wade and Dimaria (2003) found that a vignette and a photograph depicting an overweight Black woman received more positive personality ratings and higher perceived success than a vignette depicting a thin/normal weight Black woman. Participants in their study were exclusively White because it was conducted at a private university that is 98% White. Thus, the researchers suggested that higher ratings of the overweight Black woman might be attributable to stereotypes that Black women should endorse a "mammy" character (Wade &

Dimaria, 2003). The “mammy” character is a stereotypical image of an overweight Black woman who is a homemaker (Parham, White, & Ajamu, 2000). However, the “thin” Black character depicted in the vignette was normal weight. No research to date has examined the interaction of race and underweight status on ratings of personality characteristics.

Body image research demonstrates Black men and women are more accepting of larger body figures, compared with White (Rogers Wood & Petrie, 2010; Webb, Warren-Findlow, Chou, & Adams, 2013). It is not clear if this acceptance of a larger body size is linked to stronger anti-thin bias. However, one study conducted with Black adolescents found that those in the lowest BMI quintile reported more body dissatisfaction than those in the second lowest BMI quintile (Striegel-Moore et al., 2000). Although Black women endorse a larger body ideal, this ideal seems to reflect a desire for curvaceousness in the hips, breasts, and buttocks (Dawson-Andoh, Gray, Soto, & Parker, 2011). Specifically, Black men consider Black women more attractive if they are not only curvaceous, but also have a low waist-to-hip ratio (Freedman, Carter, Sbrocco, & Gray, 2004). Therefore, the Black community might be more likely to stigmatize people with underweight rather than those with overweight. As a result, Black women who are underweight might be more likely to engage in binge eating behaviors and weight gain efforts in order to achieve a more curvaceous body. Research does suggest that Black women engage in more efforts to gain, rather than lose weight (Rosen, Gross, Schneiderman, Neil, 1987; Schreiber et al., 1996).

In a cross-sectional study of Black and White female undergraduates, Black women were more likely to report weighing less than their body ideal; in contrast, White women more frequently reported weighing more than their body ideal (Perez & Joiner, 2003). Further, Black and White women who were dissatisfied with their weight were significantly more likely than

women who considered themselves an ideal weight to engage in bulimic behaviors, regardless of whether or not they considered themselves underweight or overweight. In addition, Black women who perceived themselves as underweight were more likely to binge eat than Black women who did not perceive themselves as underweight. As a result, the curvier body ideal of the Black community does not necessarily act as a buffer against disordered eating (Perez & Joiner, 2003).

Social Comparison Theory

Social comparison is another construct with relevance to weight bias and appearance ideals. Festinger (1954) theorized that people evaluate themselves by comparing themselves to others. There are three ways people compare themselves: upward social comparison, downward social comparison, and lateral social comparison. Downward social comparison occurs when individuals compare themselves to those they consider less desirable, whereas upward social comparisons are made with individuals whom they consider more desirable than themselves. Lateral social comparison refers to people making comparisons to others to whom they consider themselves similar.

With respect to body image, women tend to engage in more upward social comparisons, comparing themselves to women they view as more attractive (Leahey, Crowther, & Mickelson, 2007; Morrison, Kalin, & Morrison, 2004). In a longitudinal study of female undergraduates, researchers found that upward social comparisons were associated with increases in negative affect and body dissatisfaction (Leahey et al., 2007). Also, research suggests that upward social comparisons might lead people to internalize unrealistic body ideals, which in turn increases body dissatisfaction and subsequent disordered eating (Dittmar, 2005; Fitzsimmons-Craft, 2011; Myers & Crowther, 2009).

In contrast, people who engage in more frequent downward social comparisons tend to have higher body esteem (Kim, & Jarry, 2014). For example, in a cross-sectional study of female undergraduates, women who engaged in more frequent downward social comparisons had less body dissatisfaction than women who engaged in fewer downward social comparisons (Kim & Jarry, 2014). Thus, downward social comparisons can be a protective strategy that enhance body esteem. Individuals might compare themselves to those they perceive as less physically attractive to highlight the discrepancy between themselves and a less attractive person, which results in improved body image (O'Brien, Hunter, Halberstadt & Anderson, 2007). In the context of weight bias, these findings suggest that women might attempt to improve their body image by criticizing others whose weight is either in the overweight or underweight range (Alicke, 2000). Although there is research on downward social comparisons with overweight individuals (Bailey & Ricciardelli, 2010; Heinberg & Thompson, 1992; Lin & Kulik, 2002; Ramirez & Milan, 2016; Rancourt, Leahey, LaRose, & Crowther, 2015), there is only one study to date on downward social comparisons with underweight individuals (Allison & Lee, 2015).

Summary and Purpose of the Current Study

This study investigated anti-thin bias in a diverse sample of young adults, to enhance understanding of the role of race and ethnicity on perceptions of thinness. Weight bias literature has primarily focused on individuals with overweight and obesity, despite some evidence of the existence of anti-thin bias. Research on anti-attractiveness bias suggests that people might envy same gendered people who meet a cultural body ideal, and, consequently, might stigmatize them to reduce perceived social threat (Agthe et al., 2010; Agthe et al., 2011). Further, body image ideals are fluid, and research suggests that the Western beauty ideal is shifting from thin, emaciated body types to a thin, athletic body type, which could lead to increased stigmatization

of women considered underweight (Boepple & Thompson, 2014; Karazsia et al., 2016; Simpson & Mazzeo, 2016). Weight stigma is related to higher rates of overeating (Sutin et al., 2016), depressive symptomatology (Wott & Carels, 2010), weight gain (Tomiya, 2014), and cortisol activity (Schvey et al., 2014) regardless of one's actual weight status. Therefore, it is important to investigate this stigma across a variety of weight statuses.

Most of the research on weight discrimination in samples of individuals considered underweight has focused on children and adolescents. For example, both overweight and underweight youth experience weight-related teasing more frequently than normal weight peers (Neumark-Sztainer et al., 2002). The experience of weight-related teasing is associated with higher levels of disordered eating (Neumark-Sztainer et al., 2002), depressive symptoms, and body dissatisfaction (Eisenberg et al., 2003), and lower perceived social support and self-esteem (O'Dea & Amy, 2011), regardless of one's weight status, age, and race/ethnicity. However, anti-thin bias continues into adulthood. Little research has examined adults' attributions about the etiology of underweight. Enhancing understanding of these attributions might clarify why individuals with an underweight BMI experience more weight-related teasing than their peers with a normal weight BMI.

Furthermore, weight stigma might differ across racial and ethnic groups because of cultural differences in body image ideals. For instance, the Black community endorses a more curvaceous female body ideal than the White community (Rogers Wood & Petrie, 2010; Webb et al., 2013). This is often highlighted as a potential buffer against the development of restrained eating within the Black community (Anderson & Hay, 1985; Striegel-Moore et al., 2000). However, this ideal might also lead to increased anti-thin bias in the Black community (Aruguete

et al., 2004; Gordon et al., 2010). More research is needed to understand how weight stigma differs across different races/ethnicities.

This study has four aims: (1) to investigate whether anti-thin bias exists in a college sample; (2) to examine participants' perceived etiology of weight for underweight vignette characters; (3) to evaluate whether participants' individual characteristics (social comparison, conceptualization of beauty, and BMI) are associated with their vignette ratings; and (4) to investigate the possible health implications (e.g. disordered eating and self-esteem) of anti-thin bias. Research has not explored whether anti-thin bias continues into young adulthood. This age group is an important one to study because the transition to college is linked to increased body image concerns (Barker & Galambos, 2007; Cain, Epler, Steinley, Sher, & Watson, 2010), eating disorder symptomatology (Vohs, Heatherton, & Herrin, 2001), and weight gain (Deforche, Van Dyck, Deliens, De Bourdeaudhuij, 2015). Results will enhance insight into anti-thin bias, with the ultimate goal of informing body image, weight bias, and healthy weight management interventions.

Method

Power Analysis

G*Power software (Faul, Erdfelder, Buchner, Lang, 2009) was used to conduct an a priori power analysis to determine sample size. A meta-analysis of weight-based discrimination in the workplace revealed large effect sizes ($f^2 = .52$; Rudolph, Wells, Weller, Baltes, 2009). A previous study on anti-thin bias found a small effect size ($f = .18$; Tantleff-Dunn et al., 2009). Given that anti-thin bias is a relatively under researched topic, the more conservative effect size was used ($f = .18$). A 2 x 3 ANOVA was used to detect our smallest potential effect size, a total sample size of 341 was considered adequate (power $\geq .8$, $\alpha \leq .05$), but the researcher aimed to

recruit 480 ($n = 80$ per group) to account for missing or incomplete data and to obtain more diversity in the sample.

Participants

Participants were enrolled in psychology classes and received partial course credit for completing the study; 487 people completed the informed consent, 434 people completed the second part of the survey, 2 people were deleted for completing less than 60% of the questionnaires, and 55 people were excluded from the analyses for not answering all three validation questions correctly. The final sample ($n = 383$) was 77.0% female ($n = 295$), 21.1% male ($n = 81$), 1.6% identified as an “other” gender ($n = 6$), and included the following racial/ethnic groups: 49.1% White ($n = 188$), 27.7% Black ($n = 106$), 12.5% Latino/a/Hispanic ($n = 48$), 24.3% Asian ($n = 93$), 0.3% Hawaiian ($n = 1$), 2.3% Pacific Islander ($n = 9$), and 2.3% Native American ($n = 9$). Students were instructed to choose all races/ethnicities that applied. Participants’ mean age was 18.99 ($SD = 2.45$) and mean BMI was 24.30 with a range from underweight (BMI = 15.64) to obese (BMI = 49.60); 69.7% ($n = 267$) were first-years, 14.4% ($n = 55$) were sophomores, 12.0% ($n = 46$) were juniors, 3.1% ($n = 12$) were seniors, and 0.5% ($n = 2$) were graduate students.

Vignette Selection

Vignette studies are widely used in the social and behavioral sciences to assess attitudes and related constructs when experimental manipulation is unethical or impractical (Evans et al., 2015). A systematic review of these types of studies found high construct validity of vignettes that are based on previous literature and are between 50 and 500 words (Evans et al., 2015). Vignettes developed for this study met these guidelines and used a factorial 2 (vignette race: White and Black) x 3 (vignette weight status: slightly underweight, normal weight, and slightly

overweight) design. Participants were randomly assigned to one of six vignette conditions (underweight/White, normal weight/White, overweight/White, underweight/Black, normal weight/Black, overweight/Black). All the vignettes described a female character. Vignette details were adapted from a previous weight bias vignette study used by Mussap, Manger, and Gold (2016). Height of the vignette character was determined from the current average female height in the United States (HHS, Centers for Disease Control and Prevention [CDC], National Center for Health Statistics [NCHS], 2016). Body weight was based on Swami and colleagues' (2008) study and dress size was based on Cundall and Guo's (2017) study (Appendix A).

Measures

Demographic information. This questionnaire asked participants their age, year in school, race/ethnicity, and gender (Appendix B). Additionally, participants were asked to report their height and weight in order to calculate BMI. Although self-reported BMI is subject to error, studies find that self-reported BMI and measured BMI are highly correlated in primarily normal weight samples (Gorber, Tremblay, Moher, & Gorber, 2007; Stommel & Schoenborn, 2009), and is an appropriate methodology in studies such as the current one, in which investigator-conducted anthropometric assessments are impractical.

Validation questions. Participants were asked three questions to assess whether they attended to the content of the vignettes. Items included: “Was the person in the vignette male or female?” and “What was the person’s race?” Consistent with prior research, participants also were asked to describe the vignette character’s weight (Allison & Lee, 2015; Wade & Dimaria, 2003; Appendix C).

Fat Phobia Scale (FPS). Participants rated vignettes on various characteristics adapted from Robinson, Bacon, and O’Reilly's FPS (Appendix D; 1993). The adapted measure consists

of 36 of the original 50 items (14 items were deleted because they were repetitive or irrelevant to the topic of anti-thin bias). This shortened measure was used in a previous study examining perceptions of underweight women (Tantleff-Dunn et al., 2009). The scale consists of bipolar adjectives (i.e. Lazy...Industrious, Unfriendly...Friendly) and asks respondents to rate individuals depicted in vignettes on a scale ranging from one to five, where one indicates more negative perceptions and five indicates more positive perceptions. All of the items are added together to get an FPS total score. Higher FPS total scores indicate that the individual is more likeable. Construct validity for the original scale was demonstrated through reductions in fat phobia after a body image intervention (Robinson et al., 1993). A previous study using this measure to investigate anti-thin bias found that it yielded internally consistent scores (Cronbach's alpha = .82; Tantleff-Dunn et al., 2009). Cronbach's alpha was .90 in the current study.

Etiology of weight. Participants were asked to indicate the extent to which 11 factors contributed to the weight of the character depicted in the vignette. These items were originally developed for a study investigating beliefs about the etiology of obesity (Appendix E; Foster et al., 2003). They have subsequently been used in several other weight bias studies (Puhl et al., 2015; Puhl, Latner, King, & Luedicke, 2014). Items 1-3 and item 9 were changed to enhance assessment of anti-thin (vs. anti-fat) bias. Specifically, 'Physical inactivity' was changed to 'physical activity,' 'overeating' was changed to 'eating habits,' 'high fat diet' was changed to 'fat in one's diet,' and 'lack of willpower' was changed to 'willpower.' Subscales of this measure include biological factors and behavioral factors (Foster et al., 2003). Additionally, an item (i.e., 'eating disorder') was added to this measure in the current study. Participants are asked to rate the importance of each factor in influencing the vignette character's weight.

Responses are measured on a five-point scale (1 = *not at all important* to 5 = *extremely important*). This measure demonstrates convergent validity via expected associations with weight bias and BMI (Puhl et al., 2014). Cronbach's alphas for all of the subscales ranged from .70 to .88 in a previous study (Puhl et al., 2015). In the current study, Cronbach's alphas were fair based on Pontekotto and Ruckdeschel's (2007) estimates: .76 (behavioral subscale) and .70 (biological subscale).

Marlowe-Crowne Social Desirability Scale (MCSD). A brief version of the Marlowe-Crowne Social Desirability Scale (MCSD) was used to assess the socially desirability of responses (Appendix F; Crowne & Marlowe, 1960). This measure includes 13 statements to which participants answer *yes* or *no*. An example item is, "I have never deliberately said something that hurt someone's feelings." The shortened version has demonstrated acceptable reliability and concurrent validity (Reynolds, 1982). In the current study, initial assessment of internal consistency (alpha) was .68. Item-level analysis indicated that items 10 and 13 were reducing the internal consistency of the scale in the current sample. Thus, items 10 and 13 were deleted. Cronbach's alpha for the current study was .70 after these items were deleted.

Iowa-Netherlands Comparison Orientation Measure (INCOM). General social comparison was measured using the INCOM (Appendix G; Gibbons & Buunk, 1999). This measure includes 11 items rated on a five-point scale ranging from *disagree strongly* to *agree strongly*. Higher scores indicate a greater tendency to engage in social comparisons across several life domains. An example item is "I always pay a lot of attention to how I do things compared with how others do things." Evidence for this measure's convergent validity includes expected associations with depression, self-esteem, and neuroticism. This scale demonstrated

adequate internal consistency (Cronbach's alpha = .78-.85; Gibbons & Buunk, 1999).

Cronbach's alpha was .77 in the current study.

Physical Appearance Comparison Scale-Revised (PACS-R). Physical social comparison was measured using the PACS-R (Appendix H; Schaefer & Thompson, 2014). The PACS-R consists of 11 items rated on a five-point scale ranging from *never* to *always*; higher scores indicate a greater tendency to compare one's appearance with others. An example item includes: "When I'm out in public, I compare my physical appearance to the appearance of others." This measure's convergent validity was demonstrated via its expected associations with eating pathology, internalization of appearance ideals, and appearance related pressures from peers, family, and the media. This scale yielded internally consistent scores (Cronbach's alpha = .97; Schaefer & Thompson, 2014). Cronbach's alpha for the current study was .96.

Broad Conceptualization of Beauty Scale (BCBS). The BCBS assesses the extent to which participants define beauty based on a wide variety of internal and external characteristics (Appendix I; Tylka & Iannantuono, 2016). An example item is "I think that a wide variety of body shapes are beautiful for women." The BCBS consists of nine items rated on a seven-point scale ranging from *strongly disagree* to *strongly agree*. Evidence for this measure's convergent validity includes expected associations with anti-fat attitudes, thin-ideal internalization, and body appreciation. The scale also demonstrated good internal consistency (Cronbach's alpha = .88, Tylka & Iannantuono, 2016). Cronbach's alpha was .83 in the current study.

The Rosenberg Self-Esteem Scale (RSES). The RSES is a 10-item measure of general self-esteem (Appendix J; Rosenberg, 1965). An example item includes "I feel that I have a number of good qualities". Each item is rated on a scale ranging from one (*strongly agree*) to four (*strongly disagree*). Items are summed and averaged to yield a total self-esteem score.

Higher scores reflect higher self-esteem. Prior research supports this measure's internal consistency; Cronbach's alpha = .90 for women and .89 for men (Tylka & Mallinckrodt, 2006). In addition, the RSES's construct validity was demonstrated via its associations with optimism (Tylka & Mallinckrodt, 2006). Cronbach's alpha for the current study was .90.

Eating Disorder Examination Questionnaire (EDE-Q). Disordered eating behaviors were assessed using the EDE-Q (Appendix K; Fairburn & Beglin, 1994). This 36-item measure was adapted from the Eating Disorder Examination interview (EDE, Cooper & Fairburn, 1993). This measure includes four subscales: eating concern, shape concern, weight concern, and dietary restraint. Example items include: "Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?" and "Have you been afraid of losing control over eating?" The EDE-Q assesses the occurrence of symptoms in the past 28 days and each item is rated on a scale ranging from zero (*no days/not at all*) to six (*every day/markedly*). Evidence of this measure's construct validity includes its high correlation with the EDE (Mond, Hay, Rogers, Owen, & Beumont, 2004). Test-retest reliability over a two-week time period ranged from .81 - .90 for all subscales (Luce & Crowther, 1997). Also, the measure demonstrated good internal consistency for the overall score (Cronbach's alpha = .90) and the subscales had alpha levels of .70 (restraint), .73 (eating concern), .83 (shape concern), and .90 (weight concern; Peterson et al., 2007). Cronbach's alphas in the current study were as follows: .80 (dietary restraint), .91 (shape concern), .85 (weight concern), .79 (eating concern), and .72 (global eating disorder score).

Procedure

Virginia Commonwealth University's Institutional Review Board approved this study. Participants had to be at least 18 years old to enroll, and were recruited through SONA, an online

research management system. Participants were informed that the purpose of the study was to investigate factors associated with perceptions of women. The actual title and purpose of the study were initially withheld from participants to reduce socially desirable responses. Informed consent was completed online prior to data collection through REDCap (Research Electronic Data Capture; Harris et al., 2009). Participants who consented were then randomly assigned (using a random number generator) to one of six groups and received an email that directed them to additional surveys within REDCap. Participants first read the vignette followed by validation questions. Next, they answered questions about the person in the vignette and then completed the measures described above regarding their own body image, self-esteem, and eating behaviors.

Data Preparation

REDCap 7.4.22 (Harris et al., 2009) was used for data entry and SPSS 24.0 was used for data analyses. Descriptive statistics, including frequencies, means, and standard deviations were calculated to verify that randomization was successful and to ensure that the data met statistical assumptions of the planned tests. Answers to the validation questions were checked prior to analyses. Given previous research studies using vignette measures (Allison & Lee, 2014; Wade & Dimaria, 2003), participants ($n = 55$) who did not answer all three validation questions correctly were not included in any analyses. Statistical significance was tested at $p < .05$. The final sample included 383 participants.

Data Analyses

Aim I. The first aim of the study was to investigate the presence of anti-thin bias in college students. It was hypothesized that:

- (1) There would be a main effect of weight status on personality ratings as measured by the FPS (1993) total score such that (a) underweight vignette characters would be perceived

more negatively than normal weight vignette characters, and (b) underweight vignette characters would be perceived more positively than overweight vignette characters.

- (2) There would be an interaction effect between weight status and race of the vignette character such that Black vignette characters would be rated more favorably on personality ratings measured by the FPS (1993) at a higher weight status. In contrast, White vignette characters would be rated less favorably at a higher weight status.

Hypotheses 1-2 were assessed by a 2 x 3 factorial analysis of variance (ANOVA), a statistical technique that examines mean differences in a dependent variable at different levels of two or more independent variables (Tabachnick, Fidell, & Osterlind, 2001). The overall rating of the vignette character from the FPS was entered as the dependent variable and weight status and race were entered as independent variables. Two planned contrasts were conducted after the ANOVA from a priori hypotheses 1a and 1b to determine if there were mean differences in personality ratings based on different weight statuses. A Tukey's HSD post-hoc test was run following the ANOVA to evaluate hypothesis 2 and assess the nature of the interaction. A Tukey's HSD post-hoc test was used because it is a more conservative approach than Fisher's LSD post-hoc test and does not inflate the probability of Type I error as much as Fisher's LSD post-hoc procedure (Keppel & Wickens, 2004).

Aim II. The second aim of the study was to examine the relation between anti-thin bias and attributions of weight. It was hypothesized that:

- (3) Underweight vignette characters' weights would be more likely than normal weight vignette characters to be attributed to behavioral factors, rather than biological factors, as measured by the etiology of weight scale.

Hypothesis 3 was tested using a multivariate analysis of variance (MANOVA). This technique enables examination of mean differences in the attributions of weight depending on the vignette character's weight and race status. Tukey HSD post-hoc tests were conducted to determine if the mean score for behavioral and biological subscales for underweight characters differed from that of normal weight characters.

Aim III. The third aim of the study was to evaluate whether individual characteristics (social comparison, broad conceptualization of beauty, BMI) were associated with ratings of the vignette characters. It was hypothesized that:

- (4) Positive ratings of the underweight vignette character would be associated with a low participant BMI, low general and physical social comparison, and high levels of broad conceptualization of beauty.

A simultaneous multiple regression analysis was conducted to test hypothesis 4. The overall rating of the vignette character as measured by the Fat Phobia Scale was entered as the dependent variable and the rest of the variables were entered simultaneously as independent variables. Squared semipartial correlation coefficients were calculated to determine which independent variables account for significant variance in the dependent variable.

Aim IV. The fourth aim of the study was to investigate the correlates of anti-thin bias. It was hypothesized that:

- (5) Anti-thin bias, (as measured by lower ratings of underweight vignette characters) would be associated with (a) self-esteem and (b) disordered eating.

Hypotheses 5a and 5b were tested with a bivariate Pearson product-moment correlation test. Two-tailed tests were used to test significance of the correlations due to the lack of research on anti-thin bias.

Results

Descriptive Statistics

Descriptive statistics (by group) for each measure and relevant subscales are presented in Table 1. A review of each scale's skewness and kurtosis indicated that each subscale was approximately normally distributed except for the EDE-Q Eating Concern subscale, which had a skewness value of 1.26. This indicates that there were more people that had lower Eating concern scores, which is to be expected given that disordered eating behaviors are not normally distributed. Thus, all subscales were included in the following analyses.

Table 1.

Means and Standard Deviations on Measures by Group

Measures	Group					
	White & Underweight (<i>n</i> = 59)	White & Normal Weight (<i>n</i> = 70)	White & Overweight (<i>n</i> = 61)	Black & Underweight (<i>n</i> = 62)	Black & Normal Weight (<i>n</i> = 69)	Black & Overweight (<i>n</i> = 62)
RSES Total	29.92 (6.35)	29.55 (6.17)	27.95 (5.73)	28.42 (6.06)	28.33 (5.94)	29.97 (5.35)
INCOM Total	39.61 (6.60)	38.52 (5.19)	39.50 (5.68)	39.19 (6.23)	40.00 (5.80)	38.29 (6.91)
PACSR Total	21.64 (12.31)	20.54 (11.53)	23.08 (12.07)	20.05 (11.56)	21.07 (11.59)	21.58 (11.97)
MCS D Total	6.49 (2.65)	6.43 (2.58)	7.20 (2.67)	6.74 (3.01)	6.88 (3.03)	6.48 (2.67)
EDE-Q Shape Concern	2.91 (1.66)	2.86 (1.58)	3.18 (1.49)	2.71 (1.60)	2.85 (1.65)	2.77 (1.29)
EDE-Q Weight Concern	2.53 (1.69)	2.73 (1.70)	2.82 (1.40)	2.48 (1.60)	2.55 (1.70)	2.50 (1.29)
EDE-Q Eating Concern	1.77 (1.28)	1.64 (1.22)	1.78 (1.17)	1.51 (1.10)	1.65 (1.12)	1.46 (1.07)
EDE-Q Restraint	2.26 (1.22)	2.43 (1.23)	2.28 (1.19)	2.30 (1.27)	2.20 (1.22)	2.27 (1.18)
Global EDE-Q Score	2.37 (1.33)	2.42 (1.29)	2.52 (1.17)	2.25 (1.25)	2.31 (1.31)	2.25 (0.99)
BCBS Total	6.08 (0.74)	5.95 (0.78)	5.69 (1.01)	5.85 (0.95)	5.84 (0.83)	5.91 (1.06)
FPS Total	119.02 (14.21)	127.62 (14.78)	124.27 (16.03)	125.45 (14.79)	133.23 (16.02)	124.39 (15.44)

Note. RSES = Rosenberg Self-Esteem Survey; INCOM = Iowa-Netherlands Comparison Orientation Measure; PACS-R = Physical Appearance Comparison Scale-Revised; MCS D = Marlowe-Crowne Social Desirability Scale; EDE-Q = Eating Disorder Examination Questionnaire; BCBS = Broad Conceptualization of Beauty Scale; FPS = Fat Phobia Scale.

Personality Characteristics of the Vignette Character

A two-way, between groups (2x3) ANOVA was conducted to explore the impact of the vignette character's weight status and race on the overall perception of favorable personality characteristics. Social desirability (MCSD) and fat phobia (FPS) total scores were not significantly correlated, $r(382) = .001, p = .98$. Thus, social desirability was not entered as a covariate in the following analyses. There was a significant main effect of the vignette character's race on the overall perception, $F(1, 377) = 6.46, p = .01, \text{partial } \eta^2 = .02$ such that Black vignette characters were perceived more positively than White vignette characters. Additionally, there was a significant main effect of the vignette character's weight on the overall perception, $F(2, 377) = 10.19, p < .001, \text{partial } \eta^2 = .05$. Post-hoc tests using Tukey HSD revealed that the normal weight vignette characters were perceived significantly more favorably than both the underweight vignette characters ($p < .001$) and the overweight vignette characters ($p = .005$). Perceptions of overweight and underweight vignette characters were not significantly different ($p = .52$); nor did the interaction of the vignette character's race and weight status significantly affect overall perceptions, $F(2, 377) = 1.69, p = .19, \text{partial } \eta^2 = .01$ (see Figure 1). This indicates that there is not enough evidence to assume that Black and White vignette characters differed on likeability as a function of weight status.

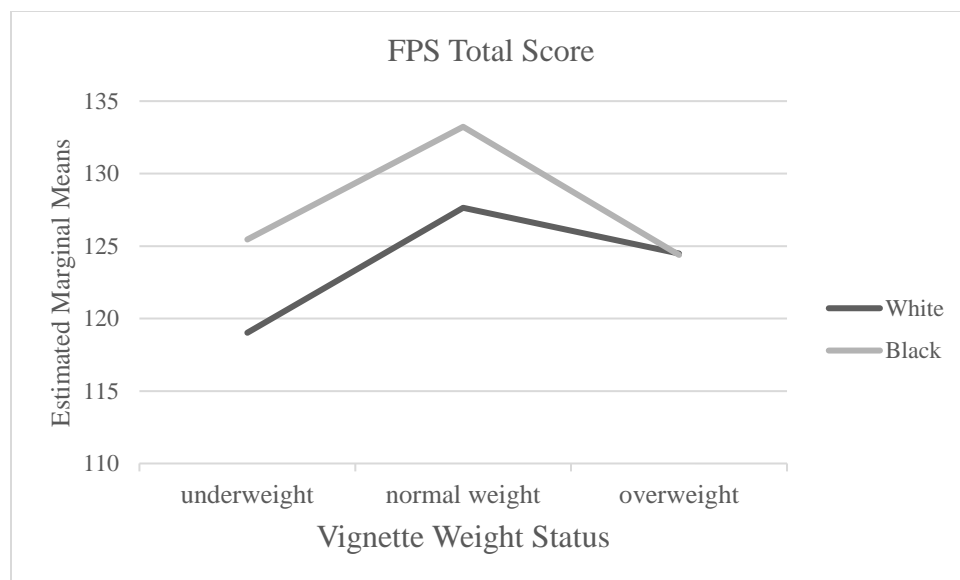


Figure 1. Mean ratings of vignette characters as a function of weight (underweight, normal weight, and overweight) and race (White and Black).

Point biserial correlations were run to see if the participant's race/ethnicity was associated with their overall perception (as measured by the FPS total score) of Black vignette characters. There was a significant positive correlation between Hispanic/Latino participants and their rating of Black vignette characters, $r(191) = .153, p = .03$.

An independent samples t-test was performed to determine if there was a significant difference between Black ($M = 125.45, SD = 14.79$) and White ($M = 119.02, SD = 14.21$) underweight vignette characters on perceived likeability (as measured by the FPS total score). FPS total score was entered as the criterion variable. Findings indicated a significant difference in perceptions between Black and White underweight characters $t(118.98) = -2.44, p = .02$ such that White underweight characters were perceived more negatively than Black underweight characters.

Planned linear contrasts were conducted to determine if there were mean differences between normal weight and underweight vignette characters on specific adjectives. In particular,

underweight vignette characters were perceived as more depressed, shapeless, moody, cold, insecure, and uptight than normal weight vignette characters. For complete results, see Table 2.

Table 2.

Means and Standard Deviations on Adjectives.

Adjectives	Underweight	Normal Weight
Lazy – Industrious	3.73 (.89)	3.86 (.87)
Sloppy – Neat	3.74 (.79)	3.85 (.89)
Nonassertive – Assertive	3.13 (.99)	3.16 (.86)
No willpower – Has willpower	3.88 (.95)	3.82 (.86)
Depressed – Happy*	3.50 (.99)	4.09 (.78)
Unambitious – Ambitious	3.87 (.92)	4.01 (.99)
Unattractive – Attractive	3.66 (.88)	3.72 (.84)
Poor self-control – Good self-control	3.68 (1.00)	3.90 (.87)
Ineffective – Effective	3.80 (.86)	3.85 (.92)
Slow – Fast	3.47 (.79)	3.45 (.81)
Careless – Careful	3.65 (.86)	3.76 (.91)
Inactive – Active*	3.55 (1.13)	3.83 (1.08)
Tries to please people – Does not try to please people	2.55 (1.01)	2.56 (.98)
Selfish – Selfless	3.34 (.79)	3.42 (.82)
Passive – Aggressive*	2.34 (.80)	2.60 (.80)
Indirect – Direct	3.11 (.90)	3.26 (.92)
Shapeless – Shapely*	2.63 (1.00)	3.29 (.90)
Moody – Even-tempered*	3.28 (.93)	3.58 (.82)
Insecure – Secure*	2.71 (1.04)	3.53 (1.00)
Dirty – Clean	3.77 (.83)	3.76 (.91)
Low self-esteem – High self-esteem*	2.75 (1.00)	3.44 (.80)
Does not attend to appearance – Attends to appearance*	3.58 (1.01)	3.85 (.83)
Having no endurance – Having endurance*	3.35 (1.00)	3.62 (.96)
Unpopular - Popular	3.60 (.93)	3.78 (.87)
Humorless – Humorous	3.49 (.82)	3.58 (.82)
Weak – Strong*	3.07 (1.01)	3.55 (.91)
Conforming – Individualistic	3.21 (.96)	3.14 (1.01)
Dependent – Independent	3.76 (.95)	3.71 (.98)
Irritable – Good-natured	3.93 (.81)	4.04 (.79)
Likes food – Dislikes food*	3.07 (1.07)	3.72 (.88)
Uptight – Easygoing*	3.65 (.98)	3.91 (.84)
Stupid – Smart	4.03 (.82)	4.13 (.85)
Overeats – Undereats*	2.06 (.88)	3.01 (.59)
Cold – Warm*	3.65 (.96)	3.90 (.79)
Hard to talk to – Easy to talk to	3.91 (.88)	3.97 (.97)
Unfriendly – Friendly	4.27 (.88)	4.24 (.96)

* indicates a significant difference

Perceived Etiology of Weight

Two between-subjects MANOVAs were conducted to examine differences in group assignment on the biological and behavioral subscales of the etiology of weight measure. Weight was collapsed to examine differences in perceptions of underweight, normal weight, and overweight vignette characters regarding the perceived etiology of their weight status. Weight was entered as the independent variable and the etiology of weight subscales were entered as the dependent variables. Box's M test for homogeneity of the variance-covariance matrices was not significant $F(6, 3284789) = .95, p = .46$, which indicates that the homogeneity of variance-covariance assumption was met. Scores on the dependent variables significantly differed across groups, Pillai's Trace = .08, $F(4, 760) = 8.22, p < .001$, partial $\eta^2 = .04$. Univariate tests revealed significant group differences in the behavioral subscale, $F(2, 380) = 3.47, p = .03$ and the biological subscale $F(2, 380) = 13.90, p < .001$. Tukey HSD post-hoc tests revealed that underweight characters' weights ($M = 14.23, SD = 3.06$) were significantly more likely to be attributed to biological factors than those of normal weight characters ($M = 12.17, SD = 3.28$) and overweight characters ($M = 12.90, SD = 3.17$). Further, there was a marginally significant difference ($p = .106$) between underweight characters' weights ($M = 23.74, SD = 5.06$) and normal weight characters' weights ($M = 22.57, SD = 4.44$) on behavioral factors. See Table 3 for means and standard deviations by weight group.

Table 3.

Means and Standard Deviations on Etiology of Weight Subscales by Weight

Subscale	Group		
	Underweight	Normal Weight	Overweight
Biological Subscale	14.23 (3.06)	12.17 (3.28)	12.90 (3.17)
Behavioral Subscale	23.74 (5.06)	22.57 (4.44)	23.96 (4.36)

Planned contrasts evaluated potential differences between underweight and normal weight women on specific items. Of note, underweight characters' weights were significantly more likely to be attributed to eating disorders, psychological problems, repeated dieting, and poor nutritional knowledge than normal weight characters' weights. See Table 4 for full results.

Table 4.

Means and Standard Deviations on Perceived Etiology

Etiology of Weight	Underweight	Normal Weight
Physical activity	3.39 (1.05)	3.31 (.92)
Eating habits	3.99 (.94)	3.78 (.93)
Amount of fat in their diet*	3.50 (1.08)	3.22 (1.02)
Genetic factors*	3.65 (.96)	3.18 (1.06)
Poor nutritional knowledge*	3.49 (1.07)	3.12 (1.03)
Psychological problems*	3.54 (1.21)	2.97 (1.13)
Repeated dieting (weight cycling)*	3.31 (1.22)	2.74 (1.14)
Restaurant eating	2.57 (1.12)	2.76 (.97)
Willpower	3.49 (1.18)	3.68 (.95)
Metabolic defect*	3.68 (1.16)	3.18 (1.10)
Endocrine disorder*	3.36 (1.17)	3.01 (1.20)
Eating disorder*	4.08 (1.09)	3.38 (1.41)

* indicates a significant difference between groups

Next, a between-subjects MANOVA was conducted to determine whether there were significant differences based on both race and weight of the vignette character. Weight status and race were combined and entered as the independent variable and the etiology of weight subscales were entered as the dependent variables. Box's M test for homogeneity of the variance-covariance matrices was not significant $F(15, 744018) = 1.07, p = .38$, which indicates that the homogeneity of variance-covariance assumption was met. Scores on the dependent variables significantly differed across groups, Pillai's Trace = .10, $F(10, 754) = 4.11, p < .001$, partial $\eta^2 = .05$. Univariate tests revealed significant group differences in the behavioral subscale, $F(5, 377) = 2.92, p = .01$ and the biological subscale, $F(5, 377) = 6.01, p < .001$. Tukey HSD post-hoc tests revealed that White ($M = 14.53, SD = 3.15$) and Black ($M = 13.95, SD = 2.97$)

underweight characters' weights were more likely to be attributed to biological factors than White ($M = 11.94$, $SD = 3.38$) and Black ($M = 12.39$, $SD = 3.19$) normal weight characters. There was not a significant difference between White ($M = 24.49$, $SD = 5.40$) and Black ($M = 23.02$, $SD = 4.63$) underweight characters and White ($M = 22.33$, $SD = 4.21$) and Black ($M = 22.81$, $SD = 4.68$) normal weight characters on the behavioral subscale. See Table 5 for means and standard deviations on subscales by group.

Pairwise comparisons were conducted to see if there was a significant difference between Black and White underweight characters regarding attributions of eating disorders and psychological problems for the characters' weights. Results revealed that there was a significant difference between the groups for psychological problems, $t(376) = 2.24$, $p = .03$ such that White underweight characters' weights were significantly more likely to be attributed to psychological problems than Black underweight characters. There was not a significant difference between White and Black underweight characters on attributions of eating disorders, $t(376) = 1.04$, $p = .24$.

Table 5.

Means and Standard Deviations on Etiology of Weight Subscales by Group

Subscales	Group					
	White & Underweight	White & Normal Weight	White & Overweight	Black & Underweight	Black & Normal Weight	Black & Overweight
Behavioral Subscale	24.49 (5.40)	22.33 (4.21)	23.11 (4.09)	23.02 (4.63)	22.81 (4.68)	24.79 (4.50)
Biological Subscale	14.53 (3.15)	11.94 (3.37)	12.67 (2.89)	13.95 (2.97)	12.39 (3.19)	13.13 (3.42)

Associations with Anti-Thin Bias

A simultaneous multiple regression examined associations between several independent variables and the overall rating of underweight vignette characters. Four independent variables were entered into the model: BMI, general social comparison, physical social comparison, and broad conceptualization of beauty (BCBS). The model was not significantly correlated with the overall rating of underweight characters, $F(4, 114) = 1.49, p = .21, R^2 = .05$. There was no evidence to indicate that BMI, $t(114) = 1.24, p = .22$, general social comparison, $t(114) = 1.63, p = .11$, or BCBS, $t(114) = -.26, p = .79$, were associated with the overall rating of underweight vignette characters. However, physical social comparison, $\beta = -.25, t(114) = -2.28, p = .03$ was significantly associated with overall ratings of underweight characters such that higher physical social comparison was related to lower ratings of underweight characters. A significant but small correlation, $r^2 = .04$, between physical social comparison and ratings of underweight women was maintained after controlling for BMI, BCBS, and general social comparison.

Correlates of Anti-Thin Bias

Pearson bivariate correlations examined the relation between ratings of underweight vignette characters and self-esteem and disordered eating symptomology. Results suggest that there was not a significant correlation between ratings of underweight vignette characters and self-esteem, $r(119) = .01, p = .89$ or global eating disorder score, $r(119) = -.10, p = .27$. Furthermore, there were no significant correlations between ratings of the underweight vignette characters and any of the subscales of the EDE-Q.

Discussion

Weight bias literature has primarily focused on people with overweight and obesity despite some evidence that people with underweight or low normal weight BMIs also experience

weight discrimination at higher rates than people with BMIs in the normal range. Weight-related teasing of people with underweight or low normal weight BMIs has primarily been documented in children (Eisenberg et al., 2003; Neumark-Sztainer et al., 2002). Weight-based discrimination is associated with both poor mental and physical health regardless of BMI status (Puhl & Heuer, 2009; Schvey et al., 2014; Tomiyama, 2014; Wott & Carels, 2010). Therefore, it is important to examine weight bias across the BMI continuum. The current study investigated the presence of anti-thin bias, defined as the belief that people with lower BMIs have unfavorable personality characteristics, in a young adult sample. Additionally, the study explored the impact of race, and attributions regarding the etiology of weight, on perceptions of individuals with BMIs in the underweight range.

Perceived Personality Attributes Based on Weight and Race

Black vignette characters were perceived more favorably than White vignette characters regardless of weight status. These results differ from those of other studies, which found that Black vignette characters are typically perceived less favorably than White vignette characters, in studies where the majority of the participants are White (van Ryn & Burke, 2000; von Hippel, Silver, & Lynch, 2000). However, the current sample was 49% White, so it could be that the more positive perceptions of Black vignette characters were due to the greater diversity of the current sample. For instance, Hispanic/Latino participants rated the Black vignette characters more positively. The more positive perceptions of Black vignette characters could also be due to social desirability. People who score high on social desirability typically are less likely to report racist attitudes (Holmes, 2014). Social desirability was assessed in the current study, and was not found to influence vignette ratings. However, some researchers have noted that social desirability measures do not adequately control for misrepresentations of prejudiced attitudes (Holmes,

2014). Thus, it is possible that participants rated Black vignette characters more favorably in order to seem less prejudiced.

Hypotheses regarding the influence of weight status on the perceived likeability of vignette characters were partially supported in that normal weight characters were perceived more favorably than both underweight and overweight characters. There were no significant differences in participants' ratings of overweight and underweight women. This finding is surprising given that past studies have documented larger effect sizes for anti-fat bias (Puhl & Heuer, 2009) compared with anti-thin bias (Tantleff-Dunn et al., 2009). However, our results are more similar to those of a recent study that found that underweight celebrities received more negative appearance-related comments than both overweight and normal weight celebrities (McDonnell & Lin, 2016).

Underweight women were more likely to be viewed as depressed, shapeless, moody, cold, insecure, and uptight compared with normal weight women. Although the current study did not qualitatively investigate reasons behind anti-thin bias, there are several possibilities. A previous study on anti-thin bias found that thin women whose body weights were attributed to hereditary factors were considered conforming, insecure, and more likely to under eat than underweight women whose weights were due to cancer (Tantleff-Dunn et al., 2009). Thus, people might be more likely to discriminate against thin women, possibly due to jealousy regarding their conformity with a cultural body ideal (Beggan & DeAngelis, 2015). In the current study, for example, people who were higher in physical social comparison were more likely to attribute undesirable personality traits to underweight women. Thus, people who tend to compare their physical appearance to others might be more likely to disparage thin women in order to improve their own self-image. Additionally, anti-thin bias might be more prevalent in this

sample because body image ideals are shifting. For instance, women exposed to fit ideal images have greater increases in body dissatisfaction than women exposed to thin ideal images (Betz & Ramsey, 2017; Mulgrew & Tiggemann, 2016).

Perceived Etiology of Weight

The hypothesis regarding perceived etiology of weight was not supported; specifically, underweight vignette characters' weights were more likely to be attributed to biological factors than were those of normal weight vignette characters. Attribution theory of weight stigma suggests that weight-based prejudice is due in part to the belief that body weight is controllable (Puhl & Brownell, 2003; Weiner, Perry, & Magnusson, 1988). Attributing body weight to genetics or other factors seen as outside of one's control can result in more favorable perceptions of people with obesity (Ebner, Latner, & O'Brien, 2011; Foster et al., 2003; Puhl et al., 2015). However, underweight women were perceived more negatively, despite the finding that most attributed their weights to biological factors. The current study did not offer an explanation for the character's body weight in the vignette. It could be that people wrongfully attribute vague information regarding body weight to personality characteristics or other internal factors. For example, Ross, Shivy, and Mazzeo (2009) found that people who are given ambiguous information about body weight etiology will stigmatize individuals with obesity at similar rates as people given a behavioral explanation for body weight. The belief that underweight characters' weights were more likely due to behavioral factors approached significance in the current sample. This result suggests that people might wrongfully attribute thin women's body weight to internal or controllable factors in the absence of more information.

Furthermore, recognizing that the cause of body weight is multidimensional might not be sufficient in counteracting weight bias. For instance, people report implicit anti-fat attitudes at

similar rates, regardless of whether genetic or behavioral explanations for body weight are provided (Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003). Thus, the current sample might have had less favorable perceptions of underweight women even though they recognized that their body weight was in part due to genetic factors.

Anti-thin bias might also reflect stigma against people with eating disorders. For instance, the current study found that underweight women's weights were more likely to be attributed to an eating disorder than were those of normal weight women. This study did not assess whether the majority of participants were psychology majors. It could be that psychology majors recognize that mental illnesses, specifically eating disorders, have a genetic component, which might explain why underweight women's weights were more likely to be attributed to biological factors (Kaye, 2008; Kaye et al., 2013). Therefore, future studies should control for knowledge about mental illnesses.

Results also revealed that participants thought White underweight women's BMIs were more likely to be due to psychological problems than were those of Black underweight women. Black underweight women were also less likely to be assigned negative personality characteristics than White underweight women. It could be that Black underweight women's weights were assumed to be due to other factors that were not included in the etiology of weight measure, such as a medical illness. For example, a prior study found that underweight women whose weights were attributed to cancer were perceived more positively than underweight women with an eating disorder (Tantleff-Dunn et al., 2009). Future studies could expand the etiology of weight measure to include other external factors as an explanation of body weight.

Interestingly, there was no difference in the perceived likelihood that Black and White underweight vignette characters had an eating disorder. This finding contradicts previous

research which suggests that Black women are less likely to be diagnosed with an eating disorder, despite experiencing eating pathology at rates similar to those of White women (Cachelin, Veisel, Barzegarnazari, & Striegel-Moore, 2000; Shaw, Ramirez, Trost, Randall, & Stice, 2004). It could be that the current sample recognized that eating disorders affect diverse populations and have diverse presentations. For example, White women have a greater likelihood of engaging in restrictive eating behaviors than Black women (Shuttlesworth & Zotter, 2011; Striegel-Moore et al., 2003). Whereas, Black women are more likely to engage in binge eating than White women (Perez & Joiner, 2003). Hence, future studies could be more specific about disordered eating behaviors.

Associations and Correlates of Anti-Thin Bias

The current study did not find a significant correlation between anti-thin bias and any of the following: broad conceptualization of beauty, BMI, general social comparison, disordered eating, or self-esteem. However, higher physical social comparison was significantly associated with lower ratings of underweight vignette characters. This finding is similar to past studies that found physical social comparison was related to more anti-fat attitudes (O'Brien, Hunter, Halberstadt, & Anderson, 2007) and a greater likelihood of engaging in weight discrimination (O'Brien, Latner, Ebnetter, & Hunter, 2013). Consequently, physical social comparison might be an appropriate target for weight bias interventions.

Implications

The current study extends knowledge in the field by demonstrating that anti-thin bias exists in a college sample. Even in the absence of an explanation for body weight, people were more likely to attribute underweight women's BMIs to an eating disorder and psychological problems, compared to those of normal weight women. Given that mental illnesses, and

specifically eating disorders, are highly stigmatized, these results suggest that women with lower BMIs might be viewed negatively by others (Murakami, Essayli, & Latner, 2016; Roehrig & McLean, 2010). Furthermore, the assumption that thinner women are more likely to suffer from an eating disorder is concerning because individuals with eating disorders can have a range of weights (Bulik, Marcus, Zerwas, Levine, & La Via, 2012; Franko et al., 2012). Thus, this stereotype could lead to under identification of eating disorders in people with overweight or normal weight BMIs.

It is important to combat weight bias across the BMI spectrum because the experience of stigma accounts for more variance in poorer health than one's actual weight status (Bacon & Aphramor, 2011; Sutin, Robinson, Daly, & Terracciano, 2016; Wott & Carels, 2010). Most weight bias interventions focus on people with overweight and obesity, despite some evidence that people with underweight or low normal weight BMIs experience weight discrimination at higher rates than normal weight people (Eisenberg et al., 2003; Neumark-Sztainer et al., 2002; Swami et al., 2008). Furthermore, most body image interventions focus on lowering thin ideal internalization, which might not be as relevant to contemporary body image ideals (Betz & Ramsey, 2017; Karazsia, Murnen, & Tylka, 2016; Vinoski, Webb, Warren-Findlow, Brewer, & Kiffmeyer, 2017). The current study found evidence of anti-thin bias. Therefore, this phenomenon warrants further research and could help inform weight bias, body image, and healthy weight interventions.

Strengths and Limitations

This project made several unique contributions to the literature. First, it demonstrated that anti-thin bias continues into young adulthood. Past studies on the perceptions of underweight women provided a singular explanation for the vignette character's weight. This is the first study

to use a validated measure, with a range of potential etiologies, to enhance understanding of attributions of underweight. This is important because attributions of weight might influence anti-thin bias. Also, the use of vignettes allowed systematic manipulation of race and weight of the vignette character. This design enabled comparisons of the vignettes while holding other variables constant.

Nonetheless, this study has several limitations. It used a convenience sampling method, which limits generalizability of the results to predominantly young, educated individuals. In addition, measures were completed online, so the research environment was not standardized and participants could have become distracted during the study. However, the validation questions attempted to mitigate this probability. Moreover, the study did not use photographs, which might help participants visualize the vignette characters. Although the use of photographs was considered, it would be difficult to manipulate the race of the photographs and keep all other variables constant. Thus, dress size information was included in the vignette to help participants visualize the character's size. Lastly, responses to questionnaires might be biased by social desirability. A social desirability questionnaire was included to capture these potential biases, but answers might not reflect participants' true attitudes.

Future Directions

More research is needed to investigate the potential impact of anti-thin bias. It is unclear whether holding anti-thin attitudes is related to unhealthy behaviors, such as exercise avoidance or disordered eating. The current project found a correlation between physical social comparison and anti-thin bias, but future studies could investigate possible mediators between this relation, as well as moderators that might buffer people from holding anti-thin attitudes. Moreover, there is not a lot of research regarding how weight discrimination might affect people of lower body

weights. Future research could utilize qualitative methods to enhance understanding of how people might experience weight shaming at lower BMIs.

Further, additional research is needed to understand how anti-thin bias might differentially affect men. Men might be more likely to experience weight discrimination at lower body weights due to different body image standards (Bassett-Gunter, McEwan, & Kamarhie, 2017; Kelly et al., 2014).

This study should be replicated in a larger, more diverse sample, which might further elucidate how anti-thin bias differentially impacts people of different racial and ethnic identities. The current study specifically examined perceptions of slightly underweight women, but future research should investigate whether low normal weight women also experience anti-thin bias. In conclusion, the current study offers evidence that anti-thin bias exists in a college sample, but more research is necessary to understand the implications of weight discrimination of people at lower body weights.

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Appendix A Vignettes

White/Underweight

Sarah is a White 19-year-old female. She is a full-time student in her sophomore year of college and she is studying marketing. Between schoolwork, housework, shopping, and socializing, she enjoys watching Netflix. She regularly hangs out with several good friends. Sarah is 106 lbs, 5'4, and a size 0 and her doctor told her that this means that she is slightly underweight.

White/Normal weight

Sarah is a White 19-year-old female. She is a full-time student in her sophomore year of college and she is studying marketing. Between schoolwork, housework, shopping, and socializing, she enjoys watching Netflix. She regularly hangs out with several good friends. Sarah is 120 lbs, 5'4, and a size 6 and her doctor told her that this means that she is normal weight.

White/Overweight

Sarah is a White 19-year-old female. She is a full-time student in her sophomore year of college and she is studying marketing. Between schoolwork, housework, shopping, and socializing, she enjoys watching Netflix. She regularly hangs out with several good friends. Sarah is 154 lbs, 5'4, and a size 12 and her doctor told her that this means that she slightly overweight.

Black/Underweight

Sarah is a Black 19-year-old female. She is a full-time student in her sophomore year of college and she is studying marketing. Between schoolwork, housework, shopping, and socializing, she enjoys watching Netflix. She regularly hangs out with several good friends. Sarah is 106 lbs, 5'4, and a size 0 and her doctor told her that this means that she is slightly underweight.

Black/Normal weight

Sarah is a Black 19-year-old female. She is a full-time student in her sophomore year of college and she is studying marketing. Between schoolwork, housework, shopping, and socializing, she enjoys watching Netflix. She regularly hangs out with several good friends. Sarah is 120 lbs, 5'4, and a size 6 and her doctor told her that this means that she is normal weight.

Black/Overweight

Sarah is a Black 19-year-old female. She is a full-time student in her sophomore year of college and she is studying marketing. Between schoolwork, housework, shopping, and socializing, she enjoys watching Netflix. She regularly hangs out with several good friends. Sarah is 154 lbs, 5'4, and a size 12 and her doctor told her that this means that she slightly overweight.

Appendix B

Demographic Questionnaire

1. Age (in whole numbers): _____

2. Year in school:

First-year (Freshman)

Sophomore

Junior

Senior

Graduate

3. Race/ethnicity (check all that apply):

White/Caucasian

Black/African-American

Hispanic/Latino

Asian/Asian-American

Other

4. Gender:

Male

Female

Prefer not to answer

Other

If other, please specify: _____

5. Current height (in inches): _____

6. Current weight (in pounds): _____

7. What is your current living situation?

Live alone

Live with parents

Live off-campus

Live on-campus

Live with roommates

8. Please type in the current month.

Appendix C
Validation questions

1. Was the person in the vignette male or female?
 Male
 Female

2. What was the person in the vignette's race?
 White/European American
 Black/African-American

3. Describe the person in the vignette's weight.
 Slightly underweight
 Normal weight
 Slightly overweight

Appendix D

Fat Phobia Scale

Listed below are 36 pairs of adjectives sometimes used to describe people. For each adjective pair, please circle the number closest to the adjective that you feel best describes your feelings and beliefs about Sarah.

1. Lazy	1	2	3	4	5	Industrious
2. Sloppy	1	2	3	4	5	Neat
3. Friendly	1	2	3	4	5	Unfriendly
4. Nonassertive	1	2	3	4	5	Assertive
5. No will power	1	2	3	4	5	Has will power
6. Warm	1	2	3	4	5	Cold
7. Depressed	1	2	3	4	5	Happy
8. Smart	1	2	3	4	5	Stupid
9. Unambitious	1	2	3	4	5	Ambitious
10. Easy to talk to	1	2	3	4	5	Hard to talk to
11. Unattractive	1	2	3	4	5	Attractive
12. Poor self-control	1	2	3	4	5	Good self-control
13. Ineffective	1	2	3	4	5	Effective
14. Popular	1	2	3	4	5	Unpopular
15. Slow	1	2	3	4	5	Fast
16. Careless	1	2	3	4	5	Careful
17. Having endurance	1	2	3	4	5	Having no endurance
18. Inactive	1	2	3	4	5	Active
19. Tries to please people	1	2	3	4	5	Does not try to please people
20. Humorous	1	2	3	4	5	Humorless
21. Strong	1	2	3	4	5	Weak
22. Individualistic	1	2	3	4	5	Conforming
23. Independent	1	2	3	4	5	Dependent
24. Good-natured	1	2	3	4	5	Irritable
25. Selfish	1	2	3	4	5	Selfless

26. Passive	1	2	3	4	5	Aggressive
27. Indirect	1	2	3	4	5	Direct
28. Likes food	1	2	3	4	5	Dislikes food
29. Dirty	1	2	3	4	5	Clean
30. Easy going	1	2	3	4	5	Uptight
31. Shapeless	1	2	3	4	5	Shapely
32. Overeats	1	2	3	4	5	Undereats
33. Moody	1	2	3	4	5	Even-tempered
34. Insecure	1	2	3	4	5	Secure
35. Low self-esteem	1	2	3	4	5	High self-esteem
36. Does not attend to own appearance	1	2	3	4	5	Attends to own appearance

Appendix E

Causes of Weight

What is the importance of each factor in causing Sarah's weight?

1=not at all important

2=somewhat important

3=moderately important

4=Very important

5=extremely important

1. Physical activity	1	2	3	4	5
2. Eating habits	1	2	3	4	5
3. Amount of fat in their diet	1	2	3	4	5
4. Genetic factors	1	2	3	4	5
5. Poor nutritional knowledge	1	2	3	4	5
6. Psychological problems	1	2	3	4	5
7. Repeated dieting (Weight cycling)	1	2	3	4	5
8. Restaurant eating	1	2	3	4	5
9. Willpower	1	2	3	4	5
10. Metabolic defect	1	2	3	4	5
11. Endocrine disorder	1	2	3	4	5
12. Eating Disorder	1	2	3	4	5
13. Other (please specify)	_____				

Appendix F
Marlowe-Crowne Social Desirability Scale (MCSD)

Please answer yes or no to the following questions.

1. It is sometimes hard for me to go on with my work if I am not encouraged.
2. I sometimes feel resentful when I don't get my way.
3. On a few occasions, I have given up doing something because I thought too little of my ability.
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.
5. No matter who I'm talking to, I'm always a good listener.
6. There have been occasions when I took advantage of someone.
7. I'm always willing to admit it when I make a mistake.
8. I sometimes try to get even rather than forgive and forget.
9. I am always courteous, even to people who are disagreeable.
10. I have never been irked when people expressed ideas very different from my own.
11. There have been times when I was quite jealous of the good fortune of others.
12. I am sometimes irritated by people who ask favors of me.
13. I have never deliberately said something that hurt someone's feelings.

Appendix G
The Iowa-Netherlands Comparison Orientation Measure (INCOM)

Response scale for all items:

1. I disagree strongly
2. I disagree
3. I neither agree nor disagree
4. I agree
5. I agree strongly

Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly 'good' or 'bad' about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do that we would like to ask you to indicate how much you agree with each statement below.

1. I often compare myself with others with respect to what I have accomplished in life.
2. If I want to learn more about something, I try to find out what others think about it.
3. I always pay a lot of attention to how I do things compared with how others do things.
4. I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing.
5. I always like to know what others in a similar situation would do.
6. I am not the type of person who compares often with others.
7. If I want to find out how well I have done something, I compare what I have done with how others have done.
8. I often try to find out what others think who face similar problems as I face.
9. I often like to talk with others about mutual opinions and experiences.
10. I never consider my situation in life relative to that of other people.
11. I often compare how I am doing socially (e.g., social skills, popularity) with other people.

Appendix H

Physical Appearance Comparison Scale-Revised (PACS-R)

People sometimes compare their physical appearance to the physical appearance of others. This can be a comparison of their weight, body size, body shape, body fat or overall appearance. Thinking about how you generally compare yourself to others, please use the following scale to rate how often you make these kinds of comparisons.

Never Seldom Sometimes Often Always
 0 1 2 3 4

	Never				Always
	0	1	2	3	4
1. When I'm out in public, I compare my physical appearance to the appearance of others.	0	1	2	3	4
2. When I meet a new person (same sex), I compare my body size to his/her body size.	0	1	2	3	4
3. When I'm at work or school, I compare my body shape to the body shape of others.	0	1	2	3	4
4. When I'm out in public, I compare my body fat to the body fat of others.	0	1	2	3	4
5. When I'm shopping for clothes, I compare my weight to the weight of others.	0	1	2	3	4
6. When I'm at a party, I compare my body shape to the body shape of others.	0	1	2	3	4
7. When I'm with a group of friends, I compare my weight to the weight of others.	0	1	2	3	4
8. When I'm out in public, I compare my body size to the body size of others.	0	1	2	3	4
9. When I'm with a group of friends, I compare my body size to the body size of others.	0	1	2	3	4

- | | | | | | |
|--|---|---|---|---|---|
| 10. When I'm eating at a restaurant, I compare my body fat to the body fat of others. | 0 | 1 | 2 | 3 | 4 |
| 11. When I'm at the gym, I compare my physical appearance to the appearance of others. | 0 | 1 | 2 | 3 | 4 |

Appendix I
Broad Conceptualization of Beauty Scale (BCBS)

How do YOU define women's beauty? Please indicate the extent to which you agree with each statement. We are only interested in YOUR beliefs, which may or may not be reflected by others or society.

- 1 = Strongly Disagree
- 2 = Moderately Disagree
- 3 = Slightly Disagree
- 4 = Neither Agree Nor Disagree
- 5 = Slightly Agree
- 6 = Moderately Agree
- 7 = Strongly Agree

1. Even if a physical feature is not considered attractive by others or by society, I think that it can be beautiful.
2. A woman's confidence level can change my perception of her physical beauty.
3. I think that a wide variety of body shapes are beautiful for women.
4. I think that thin women are more beautiful than women who have other body types.
5. A woman's soul or inner spirit can change my perception of her physical beauty.
6. I define a woman's beauty differently than how it is portrayed in the media.
7. A woman's acceptance of herself can change my perception of her physical beauty.
8. I appreciate a wide range of different looks as beautiful.
9. I think that women of all body sizes can be beautiful.

Appendix J
Rosenberg Self-Esteem Scale (Rosenberg, 1965)

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

1.	On the whole, I am satisfied with myself.	SA	A	D	SD
2.*	At times, I think I am no good at all.	SA	A	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D	SD
4.	I am able to do things as well as most other people.	SA	A	D	SD
5.*	I feel I do not have much to be proud of.	SA	A	D	SD
6.*	I certainly feel useless at times.	SA	A	D	SD
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8.*	I wish I could have more respect for myself.	SA	A	D	SD
9.*	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10.	I take a positive attitude toward myself.	SA	A	D	SD

Scoring: SA=3, A=2, D=1, SD=0. Items with an asterisk are reverse scored, that is, SA=0, A=1, D=2, SD=3. Sum the scores for the 10 items. The higher the score, the higher the self esteem.

Appendix K

Eating Disorder Examination Questionnaire (EDE-Q)Instructions

The following questions are concerned with the PAST FOUR WEEKS ONLY (28 days). Please read each question carefully and circle the appropriate number on the right. Please answer all the questions.

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS.....	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
--	------------	-------------	--------------	---------------	---------------	---------------	--------------

1. Have you been deliberating <u>trying</u> to limit the amount of food you eat to influence you shape or weight?	0	1	2	3	4	5	6
--	---	---	---	---	---	---	---

2. Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6
---	---	---	---	---	---	---	---

3. Have you <u>tried</u> to avoid eating any foods which you like in order to influence your shape or weight?	0	1	2	3	4	5	6
--	---	---	---	---	---	---	---

4. Have you tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?

0	1	2	3	4	5	6
---	---	---	---	---	---	---

5. Have you wanted your stomach to be empty?

0	1	2	3	4	5	6
---	---	---	---	---	---	---

6. Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interesting in; for example, read, watch TV, or follow a conversation?

0	1	2	3	4	5	6
---	---	---	---	---	---	---

7. Have you been afraid of losing control over eating?

0	1	2	3	4	5	6
---	---	---	---	---	---	---

8. Have you had episodes of binge eating?

0	1	2	3	4	5	6
---	---	---	---	---	---	---

9. Have you eaten in
secret? (Do not count binges.) 0 1 2 3 4 5 6

10. Have you definitely
wanted your stomach to
be flat? 0 1 2 3 4 5 6

11. Has thinking about shape
or weight made it more
difficult to concentrate on
things you are interested in;
for example read, watch TV,
or follow a conversation? 0 1 2 3 4 5 6

12. Have you had a
definite fear that you might
gain weight or become fat? 0 1 2 3 4 5 6

13. Have you felt fat? 0 1 2 3 4 5 6

14. Have you had a strong
desire to lose weight? 0 1 2 3 4 5 6

 OVER THE PAST FOUR WEEKS (28 DAYS)

15. On what proportion of time that you have eaten have you felt guilty because the effect on your shape or weight? (Do not count binges.) (Circle the number which applies.)
- 0 – None of the times
 1 – A few of the times
 2 – Less than half the times
 3 – Half of the times
 4 – More than half the times
 5 – Most of the times
 6 – Every time
-

16. Over the past four weeks (28 days), have there been any times when you have felt you have eaten what other people would regard as an unusually large amount of food given the circumstances? (Please put appropriate number in box).

- 0 – No
 1 – Yes []

17. How many episodes have you had over the past four weeks?

[] [] [] []

18. During how many of these episodes of overeating did you have a sense of having lost control over your eating?

[] [] [] []

19. Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?

- 0 – No
 1 – Yes []

20. How many such episodes have you had over the past four weeks?

[] [] [] []

21. Over the past four weeks have you made yourself sick (vomit) as a means of controlling your shape or weight?

0 – No

1 – Yes []

22. How many times have you done this over the past four weeks?

[] [] [] []

23. Have you taken laxatives as a means of controlling your shape or weight?

0 – No

1 – Yes []

24. How many times have you done this over the past four weeks?

[] [] [] []

25. Have you take diuretics (water tablets) as a means of controlling your shape or weight?

0 – No

1 – Yes []

26. How many times have you done this over the past four weeks?

[] [] [] []

27. Have you exercised hard as a means of controlling your shape or weight?

0 – No

1 – Yes []

28. How many times have you done this over the past four weeks?

[] [] [] []

OVER THE PAST FOUR WEEKS (28 DAYS) (Please circle the number which best describes your behavior.)	NOT AT ALL		SLIGHTLY		MODERATELY		MARKEDLY
29. Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
30. Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
31. How much would it upset you if you had to weight yourself once a week for the next four weeks?	0	1	2	3	4	5	6
32. How dissatisfied have you felt about your weight?	0	1	2	3	4	5	6
33. How dissatisfied have you felt about your shape?	0	1	2	3	4	5	6
34. How concerned have you been about other people seeing you eat?	0	1	2	3	4	5	6
35. How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower?	0	1	2	3	4	5	6

36. How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothes?	0	1	2	3	4	5	6
---	---	---	---	---	---	---	---