

Influence of Weight Bias and Associated Factors on Perceptions of Plus Size Models

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Abstract

Purpose: The fashion industry has recently begun to utilize plus size models. The aim of this study was to explore whether these models would be viewed more critically in comparison to thin models or subjected to weight bias and associated factors.

Methods: University students ($N = 330$, $M_{age} = 18.62$, $SD_{age} = 1.33$) viewed images of thin and plus size models and rated each image. They then filled out measures assessing weight bias (measured through the Antifat Attitudes Questionnaire), sociocultural attitudes regarding athletic and thin body types, and body appreciation.

Results: Plus size models were rated more critically than thin models ($p < 0.01$). Thin and plus size model ratings were also highly correlated ($p < 0.01$), but weight bias was still predictive of plus model ratings within a regression model that included thin model ratings ($p < 0.01$). Further, mediational analyses found that weight bias partially mediated the relationship between thin and plus size model ratings. Males were more likely to rate both model types more critically ($p < 0.01$), but weight bias was found to partially mediate the relationship between male ratings of plus-sized models ($p < .001$).

Conclusions: Despite the recent steps to include more body diversity among the fashion industry, plus size models still appear to be subjected to weight bias, especially among males.

Level of Evidence: Level III, case-control analytic study.

Introduction

The media is frequently viewed as a source of weight bias, which is defined as implicit or explicit discrimination against an individual due to their weight status [1]. Unfortunately, weight stigma has been tied to harmful physical and mental health consequences [1–3]. The fashion industry and clothing retailers have similarly been criticized for using models with little body fat and promoting social and cultural attitudes that celebrate the thin ideal, which may have harmful effects on women's body image and may decrease body dissatisfaction [4]. Increasing awareness of this issue has prompted some clothing retailers to incorporate more body diversity among models [5].

While research on media and its consequences on weight bias is more ubiquitous [1–2], research focusing on this body diversity and the relatively new use of plus size models appears to be just emerging. Some studies have found that exposure to plus size models raised body satisfaction and body image among females, effectively combatting some of the effects on the thin ideal [6–9]. Two other studies have found that female exposure to plus size models may even lower weight bias [10–11].

Thus, various studies have focused on viewing thin and plus models with a subsequent comparison on of the effects of each model type on participants, but few studies have done a direct comparison on general perceptions between the two model types and examined whether weight bias, sociocultural attitudes, or body satisfaction impacts these perceptions. Additionally, the aforementioned studies have samples that consist solely of female participants, little is known about perceptions of plus size models among males, even though female models are often used for advertising products to males [12]. This may be of specific interest as males have been found to have higher levels of weight bias in comparison to females [13].

Further, demand characteristics are prominent throughout social science research [14]. Increased recognition of this issue may cause some participants to respond in a socially desirable way, possibly hiding true attitudes towards weight. In support of this idea, past research has found that explicit weight bias was not correlated with implicit weight bias, demonstrating a disconnect between what is expressed versus internal attitudes [15]. Thus, participants may have responded to plus size models more positively because they believed that this is what the researchers desired, or they did not wish to appear judgmental towards a stigmatized group (persons with overweight status). Similarly, one marketing study found that plus size models received more positive ratings and positive reactions from female participants depending on the context that the

subjects viewed images in (i.e. traditional, thin-ideal magazine versus a magazine using more diversity) [16]. Research on plus-size models may benefit from using a more subtle assessment in attempt to obtain true attitudes.

Despite movements designed to reduce weight bias, it is hypothesized that 1) plus size models will be rated more critically than thin models. Further, it is hypothesized that 2) ratings of the plus size models will be positively associated with weight bias, as well as more internalized sociocultural attitudes towards preferences for thin or muscular figures. Also, it is hypothesized that individuals with higher appreciation for their own bodies would be more accepting of plus size models. We further hypothesized that 3) gender and BMI would be associated with ratings of plus size models, such that males and individuals with lower BMI would rate plus size models more critically.

Methods

Procedure

In order to participate, students had to be at least 17 years of age. All data was collected through an online survey using Qualtrics. Initially, participants were informed that the study was about fashion. Participants reported basic demographic information (age, year of college, race, gender, sexual orientation, and height and weight and questions about fashion). The questions about fashion were to maintain the impression that the study was about fashion, thereby hopefully reducing socially desirable responding.

Next, participants viewed 22 images of models and answered questions about each. Whether the participant saw a thin or plus size model was randomized per image. For example, all participants saw the same clothing for the first image, but approximately half saw a thin model and the other half saw a plus size model. Models wearing the same outfit could then be compared, ensuring that the actual clothing item was controlled for. Participants then filled out virtual measures, and then were debriefed on the study's true purpose and asked to provide consent to use their data. The university's institutional review board approved the study.

Measures

Model Rating Scale. A 4-item scale was constructed for the purpose of this study in order to assess participants' attitudes towards the models (Table 1). There were also two questions that were not used for data analysis as they focused on the clothing rather than the model, in an effort to create the appearance that the scale was focused on fashion. The questions centered on perceptions of the model, using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree, with higher scores indicating more approval). The scale has a minimum of 4 points and a maximum of 20 points. The scale had excellent internal consistency with a Chronbach's α of .90 and McDonald's ω of .91.

The questions for the Model Rating Scale was drawn from previously established, validated measures for attitudes towards individuals who are overweight and relevant literature. Modeling is a career choice, but past research has established that people of overweight or obesity status are more likely to be seen as less capable for a career position, especially a career with face to face contact [1-2]. This stigma is apparent even when facial attractiveness is taken into account [17]. Therefore, "Is this model an appropriate choice for this dress?" was designed to assess whether plus size models are seen as capable at modeling clothing in comparison to thin models. The Antifat Attitudes Questionnaire (AFAQ) similarly includes a question about career, "If I were an employer looking to hire, I might avoid hiring a fat person" [18].

The second question, "does the model seem confident," was inspired by the Obese Persons Trait Survey (OPTS), specifically the items "Insecure" and "Outgoing" [19]. The AFAQ similarly includes the item "I have a hard time taking fat people too seriously" which suggests that it is difficult for some people to see individuals with overweight or obese status as confident or capable [18]. This focused on trait-attribution is well supported by literature as negative traits are more likely to be assigned to people who are overweight or obese [1-2]. Further, individuals with higher adiposity are more likely to be seen as having lower self-regard [17].

The third question, “does the model look attractive in this dress,” is also similar to an item on the OPTS; “Unattractive” [19]. The UMB-FAT also includes a subscale that assess attractiveness, with items like “I find fat people attractive” [20]. The link between weight and attractiveness is documented in the literature, BMI has been found to be a strong determinate for attractiveness [21].

The final question, “Would you want to be seen with someone wearing this dress?” draws upon the UMB-FAT’s subfactor “Social Distance,” which includes items like “I would be comfortable having a fat person in my group of friends” [20]. Research focused on social distance, from peers in various educational settings and in context of dating, has also been well-documented throughout the literature, through even mere proximity [1-2, 22]. Thus, all questions selected were inspired by previous validated and robust scales for weight bias [23]. Therefore, each question can be tied to a concept/construct shown to be relevant to assessing weight bias.

Anti-Fat Attitudes Questionnaire is a 13-item questionnaire developed to assess attitudes regarding fat [18], and has been found to be a robust way to measure weight bias [23]. Participants rated their level of agreement on a 10-point Likert scale (0 = very strongly disagree; 9 = very strongly agree), with higher scores indicating greater bias. The scale includes three subscales; the seven-item Dislike subscale measures overall bias of higher weight individuals. The three-item Fear of Fat subscale measures concern for gaining weight oneself. The three-item Willpower subscale measures the perception that higher weight can be controlled through motivation. A confirmatory factor analysis has supported the division of three scales [24]. Each subscale has established, good internal reliability (Dislike $\alpha = .70$, Fear of Fat $\alpha = .85$, & Willpower $\alpha = .75$). In the current investigation, each scale had good or excellent internal consistency (Dislike $\alpha = .93$, Fear of Fat $\alpha = .89$, & Willpower $\alpha = .86$).

Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4) is a 22-item questionnaire that measures social attitudes on appearance, with a 5 item subscale for both athletic ideas and thin ideals [25]. There are also three subscales focusing on a source of the pressure: family, peers, and media, each consisting of 4 items. All questions use a 5-point Likert scale, with 1 = Definitely Disagree to 5 = Definitely Agree, and higher scores symbolizing higher internalization or pressure. Each subscale had good validity and good reliability; Athletic ($\alpha = .87 - .92$), Thin ($\alpha = .86 - .92$), Family Pressure ($\alpha = .85 - .90$), Peer Pressure ($\alpha = .88 - .90$), and Media Pressure ($\alpha = .94 - .96$) [24]. In the current investigation, each scale had good internal consistency (Athletic $\alpha = .91$, Thin $\alpha = .81$, Family Pressure $\alpha = .90$, Peer Pressure $\alpha = .94$, and Media Pressure $\alpha = .96$).

Body Appreciation Scale (BAS) contains ten items that assesses participants’ positive feelings towards their body, using a 5-point Likert scale (from “never” to “always”) [26]. Higher scores indicate more appreciation. The BAS has established validity and excellent reliability ($\alpha = .94$) [26]. In the current study, the scale had excellent internal consistency ($\alpha = .95$).

Statistical Analyses

A factor analysis (using maximum likelihood method) and confirmatory factor analyses (CFA) were run using JASP in order to examine the newly created Model Rating Scale. The factor analysis used the oblique rotation method (direct oblimin was selected due to correlated factors) [27].

Then, data regarding hypotheses were analyzed using SPSS 27. A paired-samples t-test was used to determine whether students rated plus size models differently in comparison to thin models, ratings for each image was summed and averaged across model types. Correlations were used to examine relationships among thin and plus size model ratings and weight bias, sociocultural attitudes toward weight, and body appreciation. In order to examine variable predictions of plus size model ratings beyond participant thin rating patterns, hierarchal multiple regressions were run, with thin models in the first block and variables of interest in the second block. Each regression was calculated with thin model ratings in block 1, and a single AFA or SATAQ subscale in block 2, and plus size models ratings as the predictor.

T-tests were also used to examine gender differences in model ratings and anti-fat attitudes. Hierarchal multiple regressions were also used to examine key participant demographics, both with thin model ratings in block 1, and either gender or BMI (separately) at block 2, and plus size model ratings as the predictor.

Additionally, mediational analyses were conducted. First, it was examined whether fat dislike possibly accounted for differences in ratings between thin- and plus-size models. Additionally, gender was included as a covariate to examine whether this pattern was observed across both males and females. Second, the relationship between gender and plus size model ratings was examined further to explore whether AFA Dislike and AFA Willpower both potentially mediated the relationship. Thin model ratings were included for these models as a covariate to account for overall response patterns. Bootstrapping was utilized for indirect effects across all mediational analyses as this technique is robust to nonnormal data [28].

Results

Participants

A total of 330 students ($M_{\text{age}} = 18.620$, $SD_{\text{age}} = 1.33$) from a U.S. southeastern university completed the survey (Table 2). Students identified as white (69.4%), black (15.5%), Hispanic or Latinx (5.1%), Asian (4.4%) or other (4%). Most students were freshman (80.4%), female (60.4%), and identified as straight (91.2%). Height and weight were self-reported ($M_{\text{BMI}} = 23.8$; Min = 16.64; Max = 41.6).

Model Rating Scale Evaluation

Bartlett's test was significant ($p > .001$) and the KMO value was .80 suggesting that data was able to accommodate a factor analysis [27]. The initial factor analysis confirmed that the four items loaded onto one factor through examination of the scree plot and eigenvalues [26]. Proportion of variance from all factor loadings was 70%, which is acceptable for social sciences [27]. The CFA suggested that the model yielded good fit, $\chi^2(2) = 34.21$, CFI = .96, TLI = .88, and SRMR = .04, RMSEA is not reported due to the small degree of freedom [29]. Factor loadings for all four items were significant ($p < .001$) and values are provided in Table 1.

Comparison of Thin and Plus Size Model Ratings

There was a significant difference between the scores for plus size models ($M = 11.69$, $SD = 2.52$) and thin models ($M = 14.68$, $SD = 1.68$); $t(329) = 29.16$, $p < .001$. Thin models received more positive ratings.

Associations Among Model Ratings and Weight-Related Constructs

Higher ratings of thin models were positively associated with ratings of plus size models (Table 3). Higher ratings of thin models were negatively correlated with AFA Dislike and AFA Willpower scale, and pressure to be thin from peers. Plus size model ratings were negatively correlated with AFA Dislike and Willpower, a drive to look athletic, pressure to be thin from peers, but positively correlated with pressure to be thin from the media.

Predictions of Plus Sized Model Ratings

In the model with AFA Dislike, thin model ratings significantly predicted plus size ratings and accounted for 47% of the variation in plus size model ratings in block 1. The addition of the AFA Dislike subscale in block 2 explained an additional 6% of the variation, suggesting a .25 decrease on the scale for plus size models for every standard deviation of the AFA Dislike Scale. Similar patterns were encountered for AFA Willpower, SATAQ Athletic, and SATAQ Media subscales (Table 4).

Predictors and Differences Among Model Ratings and Participant Characteristics

Men ($M = 10.31$, $SD = 2.34$) and women ($M = 12.60$, $SD = 2.21$); $t(328) = -8.98$, $p < .001$ had significantly different ratings of plus size models. There was also a significant difference for thin models when comparing ratings from men ($M = 14.34$, $SD = 1.58$) and women ($M = 14.90$, $SD = 1.71$); $t(328) = -3.01$, $p < .01$. Gender was significantly predictive of plus-sized model ratings beyond thin-sized model ratings, and explained an additional 11% variability in ratings of plus size models (Table 5). Thus, female participants rated plus size models more positively.

In terms of weight bias, men reported higher levels of dislike of fat ($M=18.8$, $SD=9.2$) than women ($M=13.4$, $SD=7.9$); $t(328)=5.40$, $p < .001$ and higher belief that weight is a matter of willpower ($M=12.5$, $SD=5.2$) than women ($M=10.0$, $SD=4.6$); $t(328)=4.61$, $p < .001$. Women reported a higher fear of fat ($M=11.8$, $SD=5.7$) than men ($M=9.6$, $SD=4.8$); $t(328)=-3.65$, $p < .001$.

BMI was found to be just significant in relation to model ratings, explaining 1% variability in ratings of plus size models (Table 5). Individuals with higher BMI's rated plus size models more positively.

Mediational Analysis

Model Ratings as Mediated by AFA Dislike, Controlling for Gender. Thin model ratings were significantly predictive of plus size model ratings without considering AFA Dislike, $b=.94$, $t(317)=17.02$, $p < .001$. There was a significant, negative relationship between thin models ratings and AFA Dislike, $b=-1.51$, $t(318)=-5.41$, $p < .001$. The mediator, AFA Dislike, was significant in predicting plus size model ratings after controlling for thin model ratings, $b=-.05$, $t(317)=-4.51$, $p < .001$. The relationship between both model ratings was still significant after controlling for AFA Dislike, $b=.87$, $t(318)=15.41$, $p < .001$, suggesting partial mediation; AFA Dislike accounts partially for the overall lower scores among plus size models in comparison to thin models, even when controlling for gender. The two other AFA subscales were considered as mediators, but were not found to be significant.

Gender and Plus Size Model Ratings as Mediated by AFA Subscales, Controlling for Thin Size Model Ratings. Gender was significantly predictive of plus size model ratings without considering the mediators, $b=2.31$, $t(318)=8.99$, $p < .001$. There was a significant, negative relationship between gender and AFA Dislike, $b=-5.39$, $t(318)=-5.58$, $p < .001$, and separately, there was a significant, negative relationship between gender and AFA Willpower, $b=-2.45$, $t(318)=-4.41$, $p < .001$. The mediators were significant in predicting plus size model ratings, controlling for gender, for AFA Dislike, $b=-0.08$, $t(316)=-5.12$, $p < .001$, and AFA Willpower, $b=-0.06$, $t(316)=-2.25$, $p < .05$. The relationship between gender and plus size model ratings was significant after specifically controlling for both mediators, $b=1.71$, $t(316)=6.88$, $p < .001$, suggesting partial mediation. Bootstrapped indirect effects for both mediators, in comparison to the direct effect, suggested the proportion of the total effect that operates indirectly on the relationship between gender and plus size model ratings was 4.4% for AFA Dislike and 1.5% for AFA Willpower. Men were more critical towards plus size models, and had higher levels of AFA Dislike and AFA Willpower.

Discussion

The current study aimed to explore the relatively new use of plus size models and designed to investigate whether 1) plus size models would be rated more critically than thin models and if 2) weight bias, sociocultural attitudes and body appreciation would be associated with ratings of plus size models. We further hypothesized that 3) key participant characteristics, such as gender or BMI would be associated with ratings of plus size models as well.

While the correlation between the ratings of plus size and thin models was positive and significant (suggesting some similarities in how participants rated the models), as hypothesized, with plus size models were significantly rated more critically. Higher levels of weight stigma were linked to critical ratings of plus size models. This is consistent with the idea that weight bias remains widespread [1–2]. Additionally, weight stigma remained consistently predictive of plus size model ratings, even when controlling for ratings of thin-models (thereby accounting for overall response patterns or tendencies from participants). Further, AFA Dislike was found to partially mediate the relationship between thin and plus size model ratings, suggesting that weight bias accounted for the difference between these ratings to some extent. Therefore, even though there is a call for more plus size models in the fashion industry, negative judgments aimed toward the plus size models was still evident.

There was not a significant relationship between ratings of plus size models and a desire to be thin. It is possible that while participants may develop an internal desire for thinness, this may not translate to a negative attitude toward those who are heavier. In fact, there is evidence to suggest that this occurs among women, but not men [30]. In contrast, a desire to appear

athletic was associated with and predicted lower ratings of plus size models. This desire may be more “externalized” or applied towards others. Whether a dislike of excess weight drives the desire to be muscular or vice versa will be an important area of future inquiry.

Participants who endorsed a higher dislike of fat also rated thin models more critically. This was unexpected as past research has indicated that individuals who have an anti-fat bias may have a stronger preference for thinner figures [31]. However, participants responses in the current study may reflect a greater degree of criticalness, in general, than a dislike for thinness. Not only was the correlation between higher dislike of fat and ratings of plus sized models greater than the correlation between higher dislike of fat and ratings of thin model, but the results of the regression show a larger disdain for plus sized models after accounting for the ratings of thin models. Similarly, Carels and Musher-Eizenman [31] also found that a general tendency to judge individuals more on physical appearance was associated with higher weight bias. Future research could explore how bias relates to critical attitudes among individuals.

It was also hypothesized that, consistent with past research, participants may rate plus size models differently based on gender or BMI. Males were found to rate plus size models more critically than female participants, with weight bias partially mediating the relationship. These results are consistent with past research, as women tend to report less anti-fat attitudes [32]. One explanation posited for this is that women may be more likely to internalize the societal messages praising thinness, while men may be more likely to externalize messages and develop consequential dislike of body types higher in fat [33]. In the current study, men reported higher dislike of fat and sense that fat was a matter of willpower, and women reported higher fear of fat, consistent with the speculation above.

This draws attention to problematic responses to weight for both males and females. Yet, some early studies exposing females to plus size models have shown promise in terms of lowering anti-fat attitudes [10–11]. Perhaps the increased presence of plus size models have lowered dislike of fat in females – whether exposure to plus size models would have an impact on males’ dislike would be an interesting area of inquiry as well.

It is not surprising that BMI did not play a strong role; individuals with a higher BMI could hold similar levels of weight bias compared to individuals with lower BMI. This idea is supported by literature, individuals who are overweight may hold internal anti-fat attitudes and prefer thinner individuals [34].

Strengths

This investigation expands on current literature surrounding the relatively new use of plus-size models as well as adding to general weight bias literature. The current study also utilizes a more diverse sample as well as the inclusion of male participants. The study also aimed to reduce socially desirable responding and increase internal validity by initially informing the participants that the study was about fashion. Though a new scale was constructed for the current study, it had excellent reliability and some validity as it appeared to converge with the AFA-Q in expected ways (ratings of plus models corresponded with a dislike of fat) and was discriminate with other aspects of the AFA-Q that were less relevant (ratings of plus models did not correspond with the more internal experience of fear of fat).

Limitations

While the current study does have some strengths, limitations are present as well. Despite the evidence for the validity and reliability of the scale created for this study, it is still a new scale, and would benefit from additional research to further establish validity. While questions were created based on existing literature and valid measures, actual questions had to be tweaked in order to be relevant for a fashion focus. Further, very little research is focused on plus models, it would have been helpful to draw questions from literature that specifically focused on perceptions of plus models. Altogether, the present research greatly relies of this new scale for interpretation of findings. As such, results should be interpreted with reasonable caution and with this knowledge in mind.

Additionally, participants were university students, which is not representative of the entire population. The study utilized self-reported height and weight, which are often not reported accurately [35]. Further, the data is correlational and causation cannot be determined. Additionally, screening participants for eating disorders may have been beneficial, as eating pathology has been linked to high weight bias [36].

Conclusion

Perceptions of plus size models unfortunately still appear to be impacted by weight bias. Future studies focusing on whether plus size models can be used to shift participant attitudes on body acceptance, anti-fat attitudes, and weight bias would be informative, especially with repeated exposure to plus size models in order to investigate whether there is a dose-dependent relationship. For now, this study captures overall current attitudes towards plus size models and explores characteristics that may apply more critical attitudes towards plus size models.

What Is Already Known On This Subject?

The harmful effects (weight bias, body image concerns) of the media and fashion industries' use of an idealized thin body type has been well documented. However, recent use of plus size models among the fashion industry has prompted new research suggesting that viewing these models may reduce weight bias and improve body image and appreciation. Unfortunately, research on plus size models is relatively scarce and primarily focused on female participants only.

What Does This Study Add?

Participants were more critical of plus size models in comparison to thin models, especially males. Weight bias was found to mediate this more critical evaluation of plus size models in comparison to thin models. An idealization of a more athletic figure was also predictive of a more critical attitude towards plus size models, but not the idealization of a thin figure.

Declarations

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: No funding was received for the current study.

Ethics Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Institutional Review Board of East Carolina University.

Informed Consent: Informed consent was received from all participants.

Data Availability: The dataset generated during and analyzed during the current study are available from the corresponding author on reasonable request.

References

1. Puhl RM, Heuer CA (2009) The Stigma of Obesity: a Review and Update. *Obesity* 17(5):941–964. <https://doi.org/10.1038/oby.2008.636>
2. Puhl R, Brownell KD (2001) Bias, discrimination, and obesity. *Obes Res* 9(12):788–805. <https://doi.org/10.1038/oby.2001.108>
3. Papadopoulos S, Brennan L (2015) Correlates of weight stigma in adults with overweight and obesity: A systematic literature review. *Obesity* 23(9):1743–1760. <https://doi.org/10.1002/oby.21187>

4. Grabe S, Ward LM, Hyde JS (2008) The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychol Bull* 134(3):460–476. <https://doi.org/10.1037/0033-2909.134.3.460>
5. Pounders K, Mabry-Flynn A (2019) Consumer Response toward Plus-Size Models Featured in the Mainstream Media. *J of Consum Aff* 53(4):1355–1379. <https://doi.org/10.1111/joca.12251>
6. Clayton RB, Ridgway JL, Hendrickse J (2017) Is plus size equal? the positive impact of average and plus-sized media fashion models on women's cognitive resource allocation, social comparisons, and body satisfaction. *Commun Monogr* 84(3):406–422. doi:10.1080/03637751.2017.1332770
7. Moreno-Domínguez S, Servián-Franco F, Reyes del Paso Gustavo A, Cepeda-Benito A (2019) Images of thin and plus-size models produce opposite effects on Women's body image, body dissatisfaction, and anxiety. *Sex Roles* 80(9): 607–616. doi:10.1007/s11199-018-0951-3
8. Hendrickse J, Clayton RB, Ray EC, Ridgway JL, Secharan R (2020) Experimental effects of viewing thin and plus-size models in objectifying and empowering contexts on Instagram. *Health Commun* 1–9. <https://doi.org/10.1080/10410236.2020.1761077>
9. Ogden J, Gosling C, Hazelwood M, Atkins E (2020) Exposure to body diversity images as a buffer against the thin-ideal: An experimental study. *Psychol Health Med* 25(10):1165–1178. <https://doi.org/10.1080/13548506.2020.1734219>
10. Smirles KE, Lin L (2018) Changes in anti-fat weight bias in women after exposure to thin and plus-sizes models. *Soc Sci J* 55(2):193–197. <https://doi.org/10.1016/j.soscij.2018.02.002>
11. Stewart SJ, Ogden J (2021) The impact of body diversity vs thin-idealistic media messaging on health outcomes: an experimental study. *Psychol Health Med* 1–13. <https://doi.org/10.1080/13548506.2020.1859565>
12. Joseph WB (1982) The credibility of physically attractive communicators: A review. *J Advert* 11(3):15–24. <https://doi.org/10.1080/00913367.1982.10672807>
13. Musher-Eizenman D, Carels RA (2009) The impact of target weight and gender on perceptions of likeability, personality attributes, and functional impairment. *Obes Facts* 2(5):311–317. <https://doi.org/10.1159/000235915>
14. Nichols AL, Maner JK (2008) The good-subject effect: Investigating participant demand characteristics. *J Genl Psychol* 135(2):151–166. <https://doi.org/10.3200/GENP.135.2.151-166>
15. Carels RA, Wott CB, Young KM, Gumble A, Koball A, Oehlhof MW (2010) Implicit, explicit, and internalized weight bias and psychosocial maladjustment among treatment-seeking adults. *Eat Behav* 11(3):180–185. <https://doi.org/10.1016/j.eatbeh.2010.03.002>
16. Peck J, Loken B (2004) When will larger-sized female models in advertisements be viewed positively? The moderating effects of instructional frame, gender, and need for cognition. *Psychol Mark* 21(6):425–442. <https://doi.org/10.1002/mar.20012>
17. Pingitore R, Dugoni BL, Tindale RS, Spring B (1994) Bias against overweight job applicants in a simulated employment interview. *J Appl Psychol* 79(6):909–917. <https://doi.org/10.1037/0021-9010.79.6.909>
18. Crandall CS (1994) Prejudice against fat people: ideology and self-interest. *J Pers Soc Psychol* 66(5):882–894. <https://doi.org/doi:10.1037//0022-3514.66.5.882>
19. Puhl RM, Schwartz MB, Brownell KD (2005) Impact of perceived consensus on stereotypes about obese people: a new approach for reducing bias. *Health Psychol* 24(5):517–525. <https://doi.org/10.1037/0278-6133.24.5.517>
20. Latner JD, O'Brien KS, Durso LE, Brinkman LA, MacDonald T (2008) Weighing obesity stigma: the relative strength of different forms of bias. *Int J of Obes* 32(7):1145–1152. <https://doi.org/10.1038/ijo.2008.53>
21. Tovée MJ, Maisey DS, Emery JL, Cornelissen PL (1999) Visual cues to female physical attractiveness. *Proc Biol Sci* 266(1415):211–218. <https://doi.org/10.1098/rspb.1999.0624>
22. Hebl MR, Mannix LM (2003) The weight of obesity in evaluating others: A mere proximity effect. *Pers Soc Psychol Bull* 29(1):28–38. <https://doi.org/10.1177/0146167202238369>
23. Lacroix E, Alberga A, Russell-Mathew S, McLaren L, von Ranson K (2017) Weight bias: A systematic review of characteristics and psychometric properties of self-report questionnaires. *Obes Facts* 10(3):223–237.

doi:10.1159/000475716

24. Magallares A, Morales JF (2014) Spanish adaptation of the Antifat Attitudes Scale/Adaptación al castellano de la Escala de Actitud Antiobesos. *J Soc Psychol* 29(3):563–588. <https://doi.org/10.1080/02134748.2014.972707>
25. Schaefer LM, Burke NL, Thompson JK, Dedrick RF, Heinberg LJ, Calogero RM, ... Anderson DA (2015) Development and validation of the Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4). *Psychol Assess* 27(1):54–67. <https://doi.org/doi:10.1037/a0037917>
26. Avalos L, Tylka TL, Wood-Barcalow N (2005) The Body Appreciation Scale: development and psychometric evaluation. *Body Image* 2(3):285–297
27. <https://doi.org/10.1016/j.bodyim.2005.06.002>
28. Koyuncu I, Kılıç AF (2019) The use of exploratory and confirmatory factor analyses: A document analysis. *Egitim ve Bilim* 44(198):361–388. <https://doi.org/10.15390/EB.2019.7665>
29. Shrout PE, Bolger N (2002) Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychol Methods* 7(4):422–445. <https://doi.org/10.1037/1082-989X.7.4.422>
30. Kenny DA, Kaniskan B, McCoach DB (2015) The performance of RMSEA in models with small degrees of freedom. *Sociol Methods Res* 44(3):486–507. <https://doi.org/10.1177/0049124114543236>
31. Magallares A, Morales JF (2013) Gender differences in antifat attitudes. *Revista Psicol Soc* 28(1):113–119. <https://doi.org/10.1174/021347413804756014>
32. Carels RA, Musher-Eizenman DR (2010) Individual differences and weight bias: Do people with an anti-fat bias have a pro-thin bias? *Body Image* 7(2):143–148. <https://doi.org/10.1016/j.bodyim.2009.11.005>
33. Aruguete MS, Yates A, Edman J (2006) Gender Differences in Attitudes about Fat. *N. Am J Psychol* 8(1):183–192. <https://search.proquest.com/docview/197979537?> Retrieved from
34. Groesz LM, Levine MP, Murnen SK (2002) The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *Int J of Eat Disord* 31:1–16. <https://doi.org/10.1002/eat.10005>
35. Wang SS, Brownell KD, Wadden TA (2004) The influence of the stigma of obesity on overweight individuals. *Int J Obes* 28(10):1333–1337. <https://doi.org/10.1038/sj.ijo.0802730>
36. Rowland ML (1990) Self-reported weight and height. *Am J of Clin Nutr* 52(6):1125–1133. <https://doi.org/10.1093/ajcn/52.6.1125>
37. Vartanian LR, Porter AM (2016) Weight stigma and eating behavior: A review of the literature. *Appetite* 102:3–14. <https://doi.org/10.1016/j.appet.2016.01.034>
38. Journal: *Eating and Weight Disorders, Studies on Anorexia, Bulimia and Obesity*
39. Title: *Influence of Weight Bias and Associated Factors on Perceptions of Plus Size Models*
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Tables

Table 1
Model Rating Scale

Question	Factor Loadings
1. Do you like this dress?	--
2. Is this model an appropriate choice for this dress?	13.08***
3. Does the model seem confident?	11.16***
4. Does the model look attractive in this dress?	13.80***
5. How much do you think people would pay for this dress?	--
6. Would you want to be seen with someone wearing this dress?	10.79***

Note. Questions 1 and 5 are “distractor” variables and were not used for the analyses. *** Denotes significance at the 0.001 level (2-tailed), ** Denotes significance at the 0.01 level (2-tailed), * Denotes significance at the 0.05 level (2-tailed).

Table 2

Participant Demographics

Variable	
Age <i>M</i> (SD)	18.62 (1.33)
BMI <i>M</i> (SD)	23.88 (5.56)
Sex <i>n</i> (%)	
<i>Female</i>	199 (60.3%)
<i>Male</i>	131 (39.7%)
Race <i>n</i> (%)	
<i>Asian</i>	14 (4.2%)
<i>Black</i>	53 (16.1%)
<i>Hispanic/Latinx</i>	16 (4.8%)
<i>Middle Eastern</i>	2 (.6%)
<i>Native American</i>	4 (1.2%)
<i>Pacific Islander</i>	1 (.3%)
<i>White</i>	229 (69.4%)
<i>Multiracial/Other</i>	9 (2.7%)
Sexual Orientation <i>n</i> (%)	
<i>Straight</i>	301 (91.2%)
<i>Gay</i>	9 (2.7%)
<i>Bisexual</i>	14 (4.2%)
<i>Pansexual</i>	2 (.6%)
<i>Asexual</i>	3 (.9%)
<i>Other</i>	1 (.3%)
Year in College <i>n</i> (%)	
<i>Freshman</i>	265 (80.3%)
<i>Sophomore</i>	42 (12.7%)
<i>Junior</i>	18 (5.5%)
<i>Senior</i>	5 (1.5%)

Table 3

Correlations Between Ratings of Thin and Plus Models and Variables

	Thin Model Ratings	Plus Model Ratings	AFA Dislike	AFA Fear	AFA Willpower	SATAQ Athletic	SATAQ Thin	SATAQ Family	SATAQ Peer	SATAQ Media	BAS	WBIS
Thin Model Ratings	1											
Plus Model Ratings	.68***	1										
Weight Stigma - Dislike	-.33***	-.45***	1									
AFA Fear	-.04	-.11	.27***	1								
AFA Willpower	-.14**	-.37***	.54***	.41**	1							
SATAQ Athletic	-.10	-.21***	.17**	.09	.12*	1						
SATAQ Thin	.01	.01	.09	.39***	.05	.56***	1					
SATAQ Family	-.08	-.06	.27***	.35**	.09	.14*	.38***	1				
SATAQ Peer	-.15**	-.13*	.31***	.28**	.10	.22***	.41***	.65***	1			
SATAQ Media	.07	.15**	.04	.43**	.07	.09	.44***	.51***	.53***	1		
Body Appreciation	.10	.04	-.18**	-.43**	-.03	-.06	-.36***	-.32***	-.31***	-.35***	1	

*** Denotes significance at the 0.001 level (2-tailed), ** Denotes significance at the 0.01 level (2-tailed), * Denotes significance at the 0.05 level (2-tailed).

AFA = Antifat Attitudes; SATAQ = Sociocultural Attitudes Towards Appearance Questionnaire

Table 4

Hierarchical Regression for Variables Predicting Plus-Sized Model Ratings

Variables	R ²	F(df)	β	t
Block 1				
Thin-Sized Models	.47	285.27 (1, 319)***		
	ΔR^2	$\Delta F(df)$		
Block 2				
AFA Dislike	.06	178.68 (2, 318)***	-.25	-6.21***

Variables	R ²	F(df)	β	t
Block 1				
Thin-Sized Models	.46	281.94 (1, 326)***		
	ΔR^2	$\Delta F(df)$		
Block 2				
AFA Fear	.01	143.94 (2, 325)	-.08	-1.91

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.45	274.90 (1, 328)***		
	ΔR²	ΔF(df)	β	t
Block 2				
AFA Willpower	.08	186.41 (2, 327)***	-.28	-7.33***

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.45	270.56 (1, 323)***		
	ΔR²	ΔF(df)	β	t
Block 2				
SATAQ Thin	.00	134.86 (2, 322)	.00	-.01

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.45	268.09 (1, 322)***		
	ΔR²	ΔF(df)	β	t
Block 2				
SATAQ Athletic	.02	144.81 (2, 321)***	-.14	-3.49**

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.47	283.85 (1, 323)***		
	ΔR²	ΔF(df)	β	t
Block 2				
SATAQ Family	.00	141.56 (2, 322)	-.01	-.29

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.45	270.66 (1, 326)***		
	ΔR²	ΔF(df)	β	t
Block 2				
SATAQ Peer	.00	135.28 (2, 325)	-.03	-.63

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.46	282.83 (1, 327)***		
	ΔR²	ΔF(df)	β	t
Block 2				
SATAQ Media	.01	146.55 (2, 326)*	-.10	-2.44*

***. Correlation is significant at the 0.001 level (2-tailed); **. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).

AFA = Antifat Attitudes; SATAQ = Sociocultural Attitudes Towards Appearance Questionnaire

Table 5

Hierarchical Regression for Participant Characteristics Predicting Plus-Sized Model Ratings

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.45	274.90 (1, 328)***		
	ΔR²	ΔF(df)	β	t
Block 2				
Gender	.11	217.05 (2, 327)***	.34	9.33***

Variables	R²	F(df)		
Block 1				
Thin-Sized Models	.46	273.69 (1, 326)***		
	ΔR²	ΔF(df)	β	t
Block 2				
BMI	.01	141.34 (2, 325)	.09	2.31*

***. Correlation is significant at the 0.001 level (2-tailed); **. Correlation is significant at the 0.01 level (2-tailed);

*. Correlation is significant at the 0.05 level (2-tailed).