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Before-and-After Weight Loss Images' Effects on Body-Esteem

Audrey Boersen
Grand Valley State University

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Abstract

The purpose of this study was to examine how exposure to Before-and-After weight loss images affects body-esteem, and to explore if the race of the model moderates the relationship. Participants were 89 Caucasian females living in the United States. Participants viewed either a Before-and-After Caucasian or African American weight loss photo, or a control image. Measures of body-esteem and antifat attitudes were then collected. Unexpectedly we found that after being exposed to the images participants with a healthy BMI in the control and Caucasian model conditions reported higher body-esteem than overweight participants, however, there was no difference in the African American model condition. This difference is important because it demonstrates that body comparisons, and the effects on body-esteem, depend both on BMI of the viewer, as well as the race of the model and viewer.

"Before-and-After" Weight Loss Images' Effects on Body-Esteem

Turning on the television, or flipping through a magazine, will result in exposure to advertisements that are often designed to influence behaviors towards, attitudes of, and desires to buy products. In 2019, the weight loss advertisement industry spent a record high of $72 billion on advertisements (Research and Markets, 2019). Many of these advertisements have appeared online because increasingly people turn to the internet or social media for health information. As of 2009, 57% of all people turned to the internet to search for health-related information, and 39% of all people turned specifically to social media platforms, such as Facebook, to seek out help related to their health (Fox & Jones, 2009). While the widespread availability of health information can be beneficial there is also an increased risk of the general public becoming misinformed about what is, and is not, healthy behaviors because of the widespread use of social media (Chou, Hunt, Beckjord, Moser & Heese, 2009).

The obesity epidemic plaguing America is one of the key factors in the increased advertising budget. Over the past eighty years obesity has been tracked and has found that today's overweight and obese population is significantly higher than it has been in the past (National Institute, 2017). A 2018 study found that the U.S. ranked in the top 20 most obese countries in the world, with nearly 40% of all adults in America, over the age of 20, being considered obese (Newman, 2019; Most Obese Counties Population, 2020).

Yet, at the same time that obesity rates have increased Americans have come to embrace a thin-ideal, a standard of beauty that idolizes an ultra-thin body as the height of perfection and beauty, even though this body shape is unattainable and unhealthy for most people (McCarthy,

1990; Bair, Steele & Milles, 2014). This ideal is persistent in America because cultural standards influence people's own standards of beauty, and they then claim the thin-ideal as their personal height of perfection which they then strive for (Anschutz, Engels, Becker & van Strien, 2008). But, when people are exposed to these ultra-thin models they will often unfavorably compare themselves to the models which can result in more negative self-image (Anschutz et. al, 2008). The comparison of oneself to others is a natural reaction in a social setting. Social Comparison Theory (Festinger, 1954) proposes that people have an innate need to compare themselves to others in order to gain information about oneself and others around them. The comparison process can happen in either an upward or downward direction. An upward comparison happens against someone superior, whereas a downward comparison happens against an inferior individual. A considerable amount of research has shown that upward social comparisons of body size tend to result in higher scores of body dissatisfaction (Faith, Leone & Allison, 2007). This comparison process can be devastating in a cultural context in which everyday life revolves around the usage and consumption of social media. The images portrayed on social media platforms reinforce the thin ideal on a daily, or hourly basis, and therefore solidify the role of the thin ideal.

One of the central tenets of social comparison theory is that the comparison process results when the potential object of comparison is perceived as similar to the self on some relevant dimension or dimensions. This then raises the question of whether the race of a model might moderate the effects on body-esteem. Previous research has shown that people are more likely to compare themselves to someone who is of the same race as them, which could be a result of in-group identification (Meisel & Blumberg, 1990). The in-group identification creates

individual similarities, such as race, which affects how social comparisons affect an individual. It has been shown that social comparisons of body-esteem can be moderated by the race of the viewer and the model (David, Morrison, Johnson & Ross, 2002). This effect may be because people recognize that there are different beauty standards between different ethnic groups (Bair, Steele & Milles, 2014).

Social comparisons have become more common because social media (e.g. Facebook, and Instagram) has become one of the principle means by which cultural standards of beauty are communicated (Perloff, 2014). Social media doesn't just influence people's perceptions of such abstract ideas as body image, but also of beliefs and attitudes of health behavior (Hobbs, Broder Pope & Rowe, 2006). Sociocultural Theory (Slevel & Tiggemann, 2011) has been used to understand the media's influence of reinforcing and transmitting beauty standards to individuals and society. It has been shown that for women, exposure to the thin ideal is a positive predictor of body dissatisfaction (Slevec & Tiggemann, 2011). More recently, the usage of social media as a health communication platform allows for the widespread promotion of scientifically proven, and unproven, weight-based health behaviors (Chou, Hunt, Beckjord, Moser & Heese, 2009). One of the more pervasive ways that weight reduction health claims have been communicated has been through the use of before-and-after weight loss pictures, depicting an easy way to obtain the idealized ultra-thin body. These advertisements usually convey the message that weight loss is relatively easy, and thus obtaining the idealized body shape is relatively easy if one is motivated to do so. Research regarding these images has shown that they increase the belief that weight is controllable, body dissatisfaction, and anti-fat biases. This research has also shown that viewers derive a negative attitude toward the model from the

"Before" picture, this same negative attitude was not present when the "Before" picture was absent (Geier, Schwarts & Brownell, 2003). In an analysis of weight-loss advertisements it was shown that "Before-and-After" photos was the second most prevalent tactic to sell weight loss, in which over 20% of advertisements analyzed used this type of image (Ethan, Basch, Hillyer, Berdnik & Huynh, 2016).

Such images serve to promote the thin is healthy ideal and simultaneously serve to reinforce the stigma associated with being overweight. Previous research has shown that the thin-ideal has been associated with prosperity, happiness, increased self-control, and the possibility for self-improvement (Rodgers, 2016). In comparison, overweight people are more commonly associated with negative views as opposed to individuals of healthy weight. Most people hold this bias no matter their weight, but it was found that obese individuals hold a weaker anti-fat bias as opposed to non-obese individuals (Schwarts, Vartanian, Nosek & Brownell, 2006). Previous research has found that if obese people lose their excess weight, they will often maintain the stigmas and stereotypes associated with the obese even when they are considered a healthy weight (Fardouly &Vartanian, 2012; Latner, Ebneter &O'Brien, 2012). In addition, "Before-and-After" weight-loss advertisements have been shown to reinforce these negative obesity stigmas and the belief that weight is controllable (Geier, Schwartz & Brownell, 2003). Research regarding "Before-and-After" weight loss photos is specifically missing how exposure to such images affect the viewer's body-esteem. Since these images communicate the idea that weight is easily controllable, overweight women's body-esteem may decrease because they may feel an inability to achieve a similar outcome as the person in the image, and therefore think less of themselves. For women who are not overweight they may have higher body-esteem

scores because they appear to have control over their body and food more than overweight individuals. These women may also think less of overweight individuals because they lack the simple control it takes to lose weight. Because "Before-and-After" weight loss photos increase the belief that weight is controllable, it is hypothesized that the viewer's body-esteem will decrease when exposed to such images.

The culture's idealization of thinness fosters the prevalence of an anti-fat bias and has prompted a multitude of dieting and weight-loss advertisements that exist to promote the thin ideal to the population. These advertisements come primarily in the form of magazine ads, or television commercials because visual stimuli are best able to communicate a dramatic weight loss (Heinig, 2018). The changes portray unrealistic weight-loss expectations, either in terms of how much weight will be lost while using a product, or the amount of work that goes into losing the weight (Vakil, Chaudhyr, Doshi, Clark & Gudzune, 2017). Obese individuals are the most susceptible population to the misleading characteristics of these advertisements, as they are commonly shamed in today's society, and therefore aim to fulfill the thin-ideal of the western culture (Pirsch, Grau & Jay, 2013). One visual stimuli to portray the necessity of weight loss and of the thin ideal is through the use of "Before-and-After" weight loss pictures, in which half of the picture depicts an overweight individual before their weight loss journey, and the other half depicts a thin, beautiful after picture. Little research exists on these images, and no prior research has been done on how exposure to these images affects the viewer's body-esteem and to explore if these effects are moderated by the race of the model.

The current study examined how exposure to "Before-and-After" weight loss images affected a person's body-esteem, it also aimed to replicate the effects of race of the model on

body-esteem. It was hypothesized that exposure to "Before-and-After" weight loss images would decrease participant's body-esteem regardless of the race of the model. It was also hypothesized that participants in the Caucasian model condition would have a lower body-esteem score than those in the African American model condition. Lastly, it was expected that overweight participants would express less negative antifat attitudes scores than normal weight participants.

Method

Participants

Two hundred and ten people participated in the study. Thirty-one participants were excluded from the data because they did not complete all of the study. The dataset was further reduced by excluding both males (n = 53), non-Caucasian women (n = 22), and those who wrongly answered the manipulation check (n = 6) from the analyses. Consequently, the analysis was conducted using 89 Caucasian women who ranged in age from 18 to 72 ($M = 40.26$, $SD = 13.68$). Participants were recruited via the use of Amazon MTurk and all were residents of the United States. All participants were compensated $0.03 for their participation in the study, even if they did not fully complete the questions.

Materials

Participants were placed in one of three conditions, a "Before-and-After" weight loss Caucasian model, a "Before-and-After" weight loss African American model, or a "Before-and-After" control make-up condition. Each condition showed a side-by-side image

depicting a "Before" image and an "After" image, participants then answered various questions about the "Before-and-After" images concerning their feelings towards the individuals in the photograph, see *Appendix C*. Participants were then presented with a distractor image, a selfie of a woman to fit into the cover story of the study, after being presented with this picture participants answered questions regarding their feelings towards the individual in the picture. All images depicted women who ranged from their 20's to their 30's. The faces of the individuals of the "Before-and-After" weight loss images were blurred out to eliminate judgements of beauty based on facial features and to draw attention to the changes in body shape, see *Appendix B.*

Rosenberg Self-Esteem Scale. Participants completed the 10-item Rosenberg Self-Esteem Scale. The items were global statements (i.e. "I take a positive attitude towards myself") that measured participants' levels of agreements with each statement on a 4 point scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, 4 = *strongly agree*). Negative items were reverse scored, the RSE score was computed from the means of the items (Cronbach Alpha = .94).

Body-esteem. In order to assess body-esteem participants completed 18 items from the Mendelson Body-Esteem Scale for Adolescents and Adults (Mendelson, Mendelson & White, 2001) that assesses an individual's body-esteem based on appearance. Questions were based on how a person views their appearance (i.e. *I often wish I looked like someone else*) and assessed their levels of agreement with each statement on a 5-point Likert scale (0 = *Never*, 1 = *Some of the time*, 2 = *I don't know/most of the time*, 3 = *Most of the time*, 4 = *Always*). Negative items

were reverse scored and the score was computed by finding the means of the items (Cronbach

Alpha = .95).

Anti-Fat Attitude. Participants also completed 10 items from the Crandall Anti-Fat

Attitudes (Crandall & Martine, 1996) questionnaire that assesses an individual's perception of

weight controllability. Participants indicated their level of agreement with each statement on a

5-point scale (1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither Agree nor Disagree*, 4 = *Agree*,

5 = *Strongly Agree*). The score of the questionnaire was found by calculating the means of the

items. The test yielded a good internal consistency (Cronbach Alpha = .84).

BMI. Participants were asked to input their weight and height to calculate their BMI.

Participants with a BMI < 16 were excluded from analyses due to inaccurate reports from these

participants. During analyses participants were divided into two different BMI categories, Low

BMI and High BMI. Low BMI was considered from 16 to 30.23 and High BMI was considered

greater than 30.24. These categories were made using a median split.

Disturbed. Participants also completed a 4-item measure which assessed how disturbed

the images made them feel. Statements included such sentences such as, "This image was

heavily photoshopped" and "This image is disturbing", see *Appendix C.* Participants indicated

their level of agreement with statements on a 5-point Likert Scale (1 = *Strongly Disagree,* 2 =

Somewhat Disagree, 3 = *Neither Agree nor Disagree,* 4 = *Somewhat Agree,* and 5 = *Strongly*

Agree). A mean index was then created with higher scores indicating a more disturbed feeling

(Cronbach Alpha = .87).

Envy. Participants also completed a 2-item measure which assessed how envious the

images made them feel.   Statements included sentences such as "I wish I looked like this

person" and "I am envious of this person", see *Appendix C*. Participants indicated their level of agreement with statements on a 5-point Likert Scale (1 = *Strongly Disagree,* 2 = *Somewhat Disagree,* 4 = *Neither Agree nor Disagree,* 5 = *Strongly Agree).* A mean index was then created with higher school indicating more envy towards the model (Cronbach Alpha = .82).

Procedure

Participants were told that the study was examining egotism in social media posts and how individual differences influence such perceptions and then gave their consent to participate in such research. Participants then completed a demographic section, a series of items that assessed their social media usage and then they reported their weight, and height. Participants then completed the 10-item Rosenberg Self-Esteem Scale. In order to maintain the cover story, they also completed a 6-item personality (Goldberg, 1992).

Participants were then randomly assigned to either view the Caucasian "Before-and-After" weight-loss image, African American "Before-and-After" weight-loss image, or the "Before-and-After" make-up image. Immediately after viewing the images participants completed a 7-item questionnaire about their feelings towards the individual in the image. This questionnaire included the 2-item Envy measure, as well as the 4-item Disturbing measure, see *Appendix C*. Participants were then shown the filler image and completed the 5-item questionnaire about their feelings towards the individual in the image.

Participants then completed the 18-item revised body-esteem scale, and the 9-item Anti-Fat Attitude questionnaire. They also completed a second partial five question personality measure to distract from the goals of the study. Participants then completed a manipulation

check, asking what race the model was, as well as an open ended question questioning what the

study was about. They were then debriefed.

Results

Manipulation Check. In the Caucasian "Before-and-After" weight loss condition 100%

of participants answered that the model was Caucasian (N=31). In the African American

"Before-and-After" weight loss condition (N=30) 80% answered that the model was African

American (N=24), 13.3% answered that the model was Caucasian (N=4), 3.3% answered marked

the race as "Other" (N=1), and 3.3% answered that they didn't remember the race (N=1). In the

Control "Before-and-After" makeup picture 100% answered that the model was Caucasian

(N=34).

A series of 2 (Race of Model) x 2 (BMI: Normal vs Overweight) x 3 (Condition) Analysis of

Variances were then conducted to test each of the hypotheses. We first examined participants'

emotional reactions to the images.

Disturbed. As expected, there was a significant main effect for condition, F (2, 83) =

7.73, $p < .05$. However, contrary to expectations, post hoc comparison analyses showed that

participants in the control condition were more disturbed ($M = 3.05$, $SD = .92$) after viewing the

image than those in either the Caucasian model ($M = 2.49$, $SD = .90$) or the African American

model conditions ($M = 2.16$, $SD = .87$) ($p < .01$, respectively). There were no other significant

main effects or interactions.

Envy. Contrary to expectations, there was not a significant main effect for condition, F

(2, 83) = 2.64, *NS*. As expected, there was a significant main effect for BMI $F(1, 83) = 7.26$, p

< .01. Participants who had a low to normal BMI scores were less envious ($M = 2.01$, $SD =$ 1.00) of the models regardless of condition than those who were obese ($M = 2.68$, $SD = 1.21$).

   Anti-Fat Attitudes.   Contrary to expectations, there was not a significant main effect for condition, $F(2, 83) = .02$, *NS*.   However, there was a significant main effect for BMI, $F(1, 83) = 20.87$, $p < .01$ with participants with a lower BMI scores having more negative anti-fat attitudes ($M = 3.06$, $SD = .70$) than those with higher BMI scores ($M = 2.34$, $SD = .77$).

   Body-Esteem.   As expected there was a main effect for BMI $F(1, 83) = 36.19$, $p < .01$. Participants with a lower BMI had higher body-esteem ($M = 2.34$, $SD = .81$) than those with a higher BMI ($M = 1.23$, $SD = .76$).   There was also a significant Condition X BMI interaction, $F(2, 83) = 3.31$, $p < .05$.   Simple effect analyses revealed that in the Caucasian and Control model conditions those with low to moderate BMI scores expressed greater body-esteem than those who were overweight or obese ($M = 2.37$, $SD = .17$; $M = 2.52$, $SD = .16$), $F(1, 83) = 19.06$, $p < .01$; $F(1,83) = 25.81$, $p < .01$, respectively. In comparison in the African American model condition, those with low to moderate BMI did not report higher body-esteem ($M = 2.06$, $SD = .18$) than those who were overweight to obese BMI ($M = 1.65$, $SD = .24$), $F(2, 83) = 2.29$, *NS*.

Discussion

   The purpose of this study was to explore how exposure to Before-and-After weight loss photos affected a viewer's own body-esteem, and to see if the race of the model factors into how people perceive the weight loss of the model. Contrary to expectations, participants reported that they felt more disturbed after viewing the head shot selfie of the control condition. Such a

drastic transformation through simply the use of makeup may cause disturbing feelings because the makeup obscured the woman's face, a feature typically used to identify a person.

As predicted, overweight subjects were more envious of the models than were normal weight subjects. Such findings may be a result of the Social Comparison Theory (Faith, Leone & Allison, 2007; Anschutz, Engels, Becker & van Strien, 2008; Festinger, 1953). Previous research has found that envy is significantly affected by the upward or downward social comparison, especially in personally important domains of a person's life (Parrot & Smith, 1993; Lim & Yang, 2015). Research has also shown that envy is the most common negative emotion found in social comparison situations (Lim & Yang, 2015; Chou & Edge, 2012). Previous research shows that healthy weight individuals have less Social Comparison tendencies than obese individuals, because healthy weight individuals have higher self-esteem scores than obese individuals (Faith, Leone & Allison, 2007). The lack of negative social comparison tendencies in people with lower BMI may mean that they did not unfavorably compare themselves as much to the model, and, as a result, did not experience a sense of envy towards the model's body. An increase of social comparison tendencies in people with a higher BMI means that they spend more time examining the model and comparing their body to the model's body, which could increase their envy scores.

Contrary to expectations participant's anti-fat attitudes did not vary as a function of condition. It may be because all conditions included a model that fit into the Western thin ideal of beauty. Potentially there could be an issue with the wording of the anti-fat scale. All questions included the word "fat". Over the course of the last twenty years that this scale has been used the word "fat" has had a more negative conotation, and words such as "obese" or

"overweight" have been replacing "fat" to be more sensitive to people's feelings. This was not

considered an issue because the Anti-Fat Attitudes scale has been used in recent years, and

continues to be a reliable measure (Ravary, Baldwin & Bartz, 2019). It could also be that the

weight loss presented in the images were not drastic enough, and didn't convince participants

that overweight individuals could become thin if they desired to. Previous literature using such

weight loss images have been able to manipulate images more, such as air-brushing, and photo

editing, to make the "After" model appear thinner and give a more drastic weight loss

appearance (Durkin & Paxton, 2002; Geier, Schwartz & Brownell, 2003). It may also be the case

that Americans typically have an anti-fat bias, and that the manipulation may not have been

strong enough to shift these negative attitudes (Crandall & Martinez, 1996).

Antifat attitudes were significantly higher in healthy BMI participants and less so in

overweight participants. This finding supports previous studies that have looked at this effect

(Schwarts, Vartanian, Nosek & Brownell, 2006; Faith, Leone & Allison, 2007). This has been

explained through the use of in-group biases, in which a shared characteristic, such as being

overweight, leads to the formation of a group and within this group anti-fat attitudes decrease

because of the shared characteristic.

Body-esteem scores differed significantly with participants' BMI, where those with

higher BMI reported a lower body-esteem score when compared to those with healthy BMI.

This finding supports previous research in which obese individuals had the lowest body-esteem

score followed by overweight individuals, and healthy weight individuals had the highest

body-esteem score, which is typically explained through the desire to have a better body

(Witherspoon, Latta, Wang & Black, 2013).

However, body-esteem scores decreased as a result of being in the control or Caucasian model condition and in conjunction with being overweight. These findings are in line with social comparison theory because they indicate that people were not negatively affected by viewing the weight loss in the African American model, but were affected by the images of Caucasian women. Previous research has also shown that the social comparison process is influenced by the races of the two people involved in the comparison (Meisel & Blumberg, 1990). Thus, group identification may play a significant role in determining how people derive portions of their self-concept from groups they identify with, such as gender or race (Hogg & Reid, 2006).

It was also found that participants felt more disturbed after viewing the image of the woman modifying her makeup as opposed to either of the "Before-and-After" images. Previous research on the Objectification Theory (Bernard, Content, Servais, Wollast & Gervais, 2020) has shown that people with heavier makeup were rated as less human because the excessive use of makeup dehumanizes the woman in the photo. Participants may have felt disturbed because the model shown included heavy eye makeup, which makes the model seem less warm and less moral (Bernard, Content, Servais, Wollast & Gervais, 2020). However, it may also be the case that subjects perceived the woman as being more attractive and felt a sense of inadequacy. A third possibility is the fact that an attractive woman felt the need to become more attractive through the use of makeup, this could make participants disturbed because it shows the extreme beauty standards for women, and that women can't seem to obtain those standards naturally.

How we process and understand BMI is influenced by the world we live in and our cultural standards. The growth of social media encourages individuals to express themselves through the use of images and photos on such platforms such as Instagram and Facebook. This

can lead to near constant exposure to the thin ideal that America embraces as it's beauty standard, and encourages social comparison at every turn. This cultural standard fosters the growth and persistence of antifat attitudes, because fat does not fit into the mold of beauty we have established. For women who are constantly being pushed to fit into this mold it can foster a sense of envy if they are higher in BMI because they don't fit that mold. On the other hand individuals lower in BMI may not feel this sense of envy because they fit into what is considered beautiful already and don't need to dramatically change their body shape. In order for this social comparison to take place though, it is found that race moderates these feelings, and the comparison feelings are enhanced when the race of the viewer and model match.

Limitations & Future Research. One major limitation of this study was that there weren't enough African American participants to examine how these images affected women of different racial groups. Previous research (David, Morrison, Johnson & Ross, 2002) has shown that African American women feel race as a moderator of body-esteem. However, it would be important to know whether race is still seen as a moderator, and to know if this extends to different races as well.

Future research should try to understand if the rise of body positivity movements on social media has an affect on the ideal body that women try to achieve. Historically a woman's ideal body shape is altered based on the preference of men, as this has been the way that women gain power (Parker, 2009). The rise of feminism has tried to take back a woman's body as her own, and has been demonstrated that feminism ideals positively impact a woman's body-esteem (Kinsaul, Curtin, Bazzini & Martz, 2014). Understanding if the body ideal is changing due to body positive movements, such as Health at Every Size (National Eating Disorder Association),

is important when assessing body-esteem and the effects or necessity of weight loss in an individual.

Conclusion

This research aimed to understand how weight loss photos affect a viewer's body-esteem. Our findings regarding BMI and its effect on anti fat attitudes as well as body-esteem support the previous literature on these subjects. Additionally, it was found that body-esteem is higher for Caucasian participants with a healthy BMI when viewing Caucasian models as opposed to viewing African American models. This finding prompts further research and replication to fully understand the effects of race and BMI within the confines of the Social Comparison Theory.

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Appendix A

Figure 1.

Interaction Effects on Body Esteem Scale based on Condition and BMI
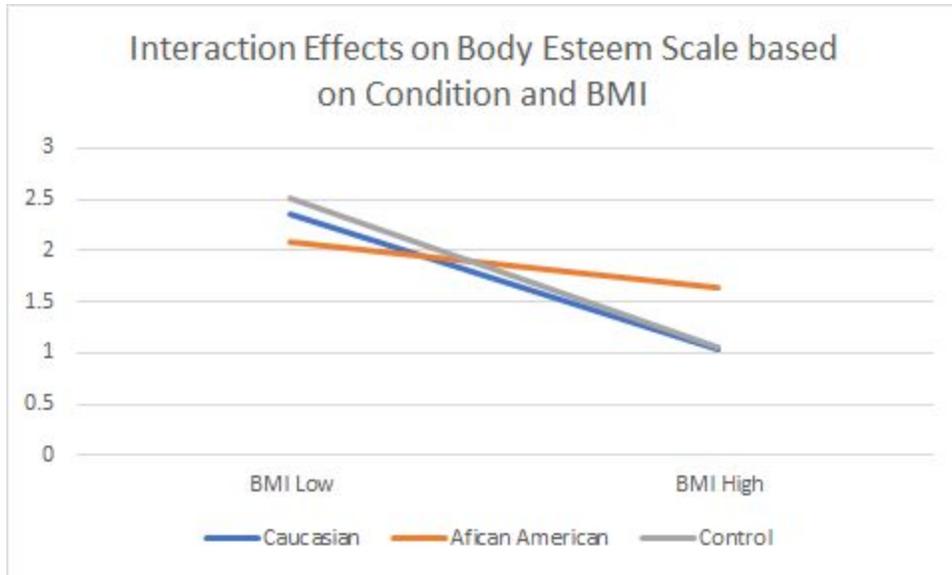
Appendix B

Image 1. Caucasian "Before-and-After" weight loss image.

Image 2. African American "Before-and-After" weight loss image.

Image 3. Control "Before-and-After" make up image.

Image 4. Distractor image.

Appendix C

"Before-and-After" image questions.

Please indicate how much you agree or disagree with each statement. (5-point scale from Strongly Disagree to Strongly Agree)

1. This image was heavily photoshopped. *(Disturbing)*

2. This image is hopeful. *(Reverse score - Disturbing)*

3. This image is disturbing. *(Disturbing)*

4. The person in the photograph is the same individual. *(Reverse Score - Disturbing)*

5. I am envious of this person. *(Envy)*

6. I wish I looked like this person. *(Envy)*

7. The woman became more attractive as a result of her actions.

Distractor image questions.

Please indicate how much you agree or disagree with each statement. (5-point scale from Strongly Disagree to Strongly Agree)

1. This image was heavily photoshopped.

2. This image is hopeful.

3. This image is disturbing.

4. I am envious of this person.

5. I wish I looked like this person.