

Does Size Matter?
Cross-sectional and Experimental Data Examining Disordered Eating Risk Factors and Anti-fat
Attitudes in the Online Body Positivity Movement

by

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Dedication

This dissertation is dedicated to my daughter Rowan Clarke. I hope this work can help make the world you grow up in a little more kind.

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Abstract

The Body Positivity Movement (also referred to as body positivity) is a social movement arising from the Fat Acceptance/Fat Liberation Movement that aims to promote body inclusivity and appreciation of body diversity and rejection of societal ideals around weight and shape. There is emerging evidence to suggest that body positivity may be beneficial in reducing risk factors for disordered eating such as body dissatisfaction. While this research is promising, there is no existing unified and research driven user-generated definition of body positivity, which is a significant gap in the existing research base, and little is known about how the movement is associated with anti-fat attitudes. Accordingly, Aim 1 of this dissertation assesses how young adult university students who identify as female define body positivity and how agreement with this definition of body positivity is associated with risk and protective factors for disordered eating as well as with anti-fat attitudes. It further examines whether complete agreement with this definition of body positivity versus complete agreement with fat liberation is associated with differences in risk and protective factors as well as with anti-fat attitudes. Aims 2 and 3 assess how exposure to different types of body positive content is associated with changes in risk and protective factors for disordered eating as well as anti-fat attitudes.

For Aim 1, 5000 undergraduate students who identified as female between 18-25 years of age were sent recruitment emails via the Registrar's Office at the University of Michigan to partake in a survey about social media and health. This cross-sectional survey assesses individual definitions and agreement body positivity definitions as well as the following outcomes: eating disorder risk, body dissatisfaction, thin ideal internalization, body appreciation, body

functionality appreciation, weight bias internalization, and anti-fat attitudes. For Aims 2 and 3, participants (N=224) were randomly assigned to view 10 images containing condition-specific stimulus images and to complete a battery of pre- and post-measures. Aim 2 examines if exposure to body positive content with or without the presence of bodies via social networking sites compared to neutral control images is associated with positive or negative risk factors for disordered eating and anti-fat attitudes, such as state body satisfaction, state shape satisfaction, state appearance satisfaction, body functionality appreciation and anti-fat attitudes. Aim 3 examines if associations between exposure to body positive content via social networking sites and risk and protective factors for disordered eating, as well as anti-fat attitudes differ by body size of the image, more specifically between exposure to images of fat bodies, mid-size bodies(bodies that might be considered somewhat “overweight” or on the smaller end of the “plus-sized clothing range (i.e., would not be categorized as the thin ideal, but are not likely to experience substantial anti-fat attitudes or discrimination)), or a condition containing both fat and mid-size bodies. Independent repeated measure Analyses of Variance (ANOVAs) are used to examine differences in all outcomes from pre to post stimulus exposure.

In Aim 1, it was found that young females (N=379) define body positivity as being primarily about “body love and confidence,” “appreciation of body diversity,” “not body shaming,” and “body acceptance,” “prioritization of health over beauty,” as well as the “rejection of societal ideals about weight and shape.” This definition will be referred to as mainstream body positivity hereafter. Linear regression models revealed significant associations between agreement with this definition of mainstream body positivity and higher body functionality appreciation as well as lower anti-fat attitudes. Contrary to the hypothesis, there was a significant association between agreement with this definition of mainstream body positivity and

thin ideal internalization. No differences in risk factor means was seen among those with complete agreement with mainstream body positivity compared to less than complete agreement. However, complete agreement with fat liberation was associated with higher body functionality appreciation, lower eating disorder risk, and lower anti-fat attitudes. For Aim 2, there were significant increases in all measures of state body satisfaction for all conditions from pre- to post-exposure, but no significant effect of condition. In Aim 3, those who viewed images of body positive content containing only fat bodies had greater increases in state appearance satisfaction. However, there were increases in all measures of state body satisfaction for all conditions. Findings from this study can be used to help public health professionals utilize mainstream body positivity and fat liberation to reduce eating disorder risk and anti-fat attitudes.

Chapter 1 : Introduction

Media representations of the ideal female body have long been linked to disordered eating and body image disturbances in women.¹ Similarly, there is persistent and prevalent weight bias related to the portrayal of fat bodies in many media modalities.² In recent years, there has been increased attention within social media platforms to the promotion of body positivity or body acceptance. While early research on the possible role of body positivity as a protective factor for disordered eating is promising, less is known about its impact on anti-fat attitudes. This dissertation aims to explore the role of the Body Positivity Movement on both protective and risk factors for disordered eating and anti-fat attitudes, with the goal of identifying population-based strategies that can reduce disordered eating, body dissatisfaction, and anti-fat attitudes and their associated negative health consequences.

Disordered eating and young adult women

Disordered eating and its often cooccurring body dissatisfaction are common among young adult women. In the United States, it is estimated that 6% of women will experience a full-syndrome eating disorder in their lifetime.³ While full-syndrome eating disorders are prevalent in young women, far more—an estimated 17%—experience disordered eating or sub-threshold eating disorders.⁴ For many women, risk factors for disordered eating, such as body dissatisfaction, increase during young adulthood.⁵

The mental and physical health effects of disordered eating are numerous and impactful. Disordered eating has been linked to multiple negative mental health outcomes in young women, such as depressive disorders, personality disorders, and decreased self-esteem.^{6,7} Disordered

eating is associated with poor physical health outcomes such as decreased cardiac health,⁸ lower bone density,⁹ dental problems,¹⁰ and electrolyte disturbances.¹¹ Furthermore, eating disorders have been linked to reduced quality of life, and they have the highest mortality rate of any psychiatric illness.¹² Treatment costs for disordered eating can cause a substantial financial burden on the individual, ranging from outpatient treatment costs to full hospitalization.¹³ In addition to the health effects and financial implications at the individual level, disordered eating can have broad and far-reaching effects at the economic and societal level. Disordered eating is a significant public health concern and has been associated with increased health care costs and loss of work productivity.^{14,15} It is estimated that the total economic cost of eating disorders in the United States is 64.7 billion USD annually.¹⁶ Subthreshold presentations of disordered eating are also associated with increased pathology and impairment, similar to that of full syndrome disorders. In a national survey of over 10,000 adolescents, those with subthreshold anorexia had comparable amounts of suicidal ideation to their full-syndrome counterparts.¹⁷ In addition to the detrimental consequences that are associated with disordered eating, body dissatisfaction is also associated with a range of poor health outcomes in women such as depression,¹⁸ and reduced quality of life.¹⁹

While eating disorders have been established as a bio-psycho-social illness,²⁰ modifiable risk factors, such as body dissatisfaction and internalization of the thin ideal, are promising targets for prevention efforts. The Tripartite model posits that young women are exposed to messages about weight and shape ideals through their families, peers, and the media.²¹ Internalization of these societal ideals about the ideal body leads to body dissatisfaction, and body dissatisfaction leads to the development of disordered eating.²¹ In recent years, increased attention is being paid to positive body image as a protective factor against disordered eating.

Positive body image is a construct that is distinct from simply an absence of body dissatisfaction. In a study using Grounded Theory to examine participant interviews and expert opinion on body image, researchers developed the following robust and working definition of positive body image as:

“an overarching love and respect for the body that allows individuals to (a) appreciate the unique beauty of their body and the function that it performs for them; (b) accept and even admire their body, including those aspects that are inconsistent with idealized images; (c) feel beautiful, comfortable, confident, and happy with their body, which is often reflected as an outer radiance, or a “glow;” (d) emphasize their body’s assets rather than dwell on their imperfections; (e) have a mindful connection with their body’s needs; and (f) interpret incoming information in a body-protective manner whereby most positive information is internalized and most negative information is rejected or reframed (p. 112).”²²

Role of the media

The role of media in the development of body image and eating disturbances is well established. Historically, the association between media exposure, in particular print and television, and body image disturbance has been linked to internalization of the thin ideal.²³ Internalization of the thin ideal has been found to predict body dissatisfaction in a longitudinal sample of adolescent girls.²⁴ Women who internalize societal messages about the goodness of thinness are more likely to want a thin body. For many women, this desire for thinness increases dieting behaviors,²⁵ which, in turn, increases the risk for disordered eating.²⁶

Media consumption has changed significantly in the past two decades, as evidenced by the advent and proliferation of social networking sites. Social networking sites operate under a

wide variety of formats; some social networking sites are primarily text based (i.e., Twitter), while others are primarily photo or video based (i.e., Instagram, SnapChat, and TikTok). Social networking sites offer a distinct experience relative to traditional media, including features that allow users to engage with their peers using “likes,” comments, or messaging. Social networking sites are utilized by a large number of young adult women, with 90% of young adults reporting use of at least one social networking site.²⁷ Considering mechanisms outlined in the Tripartite Model, social networking sites may have the potential to be uniquely problematic in regards to disordered eating risk as they combine both exposure to ideal images of bodies, but also the reinforcement of these messages from peers and family members via “likes” and commenting.

Like more traditional forms of media, social networking site use has been linked to disordered eating pathology and body image disturbance. One study in a nationally representative sample of over 1700 young adults between 19 – 32 years of age found an association between both volume (time spent per day) and frequency (visits per week) of social media use with disordered eating pathology.²⁸ Other studies have also found a relationship between social networking site use and disordered eating, especially in samples of young adult women and adolescent girls.^{29,30} In addition to disordered eating, social media use has also been linked to body dissatisfaction in young women.³¹ In a sample of over 11,000 adults living in New Zealand, having a Facebook account was associated with lower body satisfaction in both women and men, across all age categories.³² While these broad associations are helpful in identifying social media use as potentially problematic, they tell us little about the specific activities on social networking sites that may be harmful.

The association between use of social networking sites and disordered eating and body image dissatisfaction is likely a function of the specific content an individual is exposed to and

the way that an individual interacts with that content. For example, engaging in photo-based activities on social networking sites has been shown to be particularly problematic in terms of risk of body dissatisfaction.^{33,34} In an experimental study of over three hundred undergraduate women, participants who were assigned to view Instagram as opposed to Facebook, reported engaging in significantly more appearance comparisons.³⁵ Furthermore, in a sample of undergraduate Italian women, time spent on social networking sites, frequency of selfie posting, and frequency of selfie editing were associated with greater self-objectification.³⁶ Selfie-editing in particular has been linked to increases in body dissatisfaction, particularly facial dissatisfaction.³⁷ Body dissatisfaction related to photo-based activities may occur due to increased appearance comparisons or via self-objectification, mechanisms that have been linked to body dissatisfaction.^{38,39} These types of photo-based activities may be particularly harmful for those with a higher underlying risk for disordered eating (i.e., those with preexisting risk factors such as body dissatisfaction, high thin ideal internalization, etc.).

Research dedicated to combating societal messages about the thin ideal, with the goal of decreasing body dissatisfaction and disordered eating, has largely been conducted among adolescent girls and college age women. Many of these interventions have focused on developing media literacy skills⁴⁰ across both traditional media⁴¹ and social media,^{42,43} and have shown promising results in terms of reducing risk factors for disordered eating. Interventions aimed at changing the psychological lens through which young women consume media images have shown more conflicting results. One study examining the impact of focusing on the functionality of the body when viewing media images demonstrated that changing the focus to functionality was associated with more functionality-based self-comparisons among participants, which served as a moderator for the outcomes of functionality and appearance satisfaction.⁴⁴

Women who reported higher functionality-based self-comparisons had lower functionality satisfaction and lower appearance satisfaction.⁴⁴ In a pilot study that examined the impact of a writing prompt related body functionality prior to thin ideal image exposure, participants who focused on functionality had greater body functionality satisfaction and body appreciation than their control counterparts; however, no effect was seen on appearance satisfaction or self-objectification.⁴⁵

While there is a robust literature related to the representation of thin/idealized bodies in the media and disordered eating risk, the presentation of fat bodies and how media contribute to weight bias has been less well studied. Weight bias, which refers to the negative beliefs, attitudes, and stereotypes that are held about people who live in larger bodies,⁴⁶ has been documented in children's media, news outlets, in other print and visual media,² and in online spaces, such as forums and social networking sites.⁴⁷ Individuals who internalize weight bias, much like those who internalize the thin ideal, are at increased risk of disordered eating⁴⁸ and body dissatisfaction.⁴⁹ The internalization of weight bias is linked to poor physical health outcomes such as metabolic dysregulation,⁵⁰ as well as poor mental health outcomes such as increased depression and reductions in self-esteem.⁵¹ Internalization of weight bias is thought to be a key mediator between the experience of weight bias and its associated negative health consequences.⁵²

While interventions aimed at improving media literacy and reducing internalization of the thin ideal have shown some promise, there is less research to support the use of interventions to reduce anti-fat attitudes. However, there is growing experimental research to support the inclusion of higher weight individuals in non-stigmatizing media representations. In one study conducted with adults, when presented with either a stereotyped image or positive image of a

person with a higher body weight, participants were supportive of the more positive depictions.⁵³ Another study demonstrated that women exposed to body positive campaigns like Aerie or Dove experienced increases in positive affect and improved self-esteem, compared to those who viewed thin-ideal or neutral media clips.⁵⁴ Furthermore, when viewing media images of women, women demonstrated the greatest body satisfaction and lowest amount of social comparison when viewing women considered to be “plus-sized,” followed by “average” weight women, and finally by women whose bodies aligned with the thin ideal.⁵⁵

Social movements and the body

In the previous section, media use, particularly media that reflects the thin ideal, has been established as a modifiable risk factor in the prevention of disordered eating and associated risk factors. Furthermore, image or photo-based social networking sites have been posited as a potential site for intervention due to the ubiquitous use among young adults. In the following section, two social movements with significant online activism on social networking sites, as well as a focus on the body, will be discussed as possible targets for intervention.

Modern fat liberation found a voice in the social upheaval of the 1960s. Leaning into the cultural zeitgeist of the 1960s, fat liberation aimed to reduce the anti-fat attitudes existing within society. Amidst the framing of “obesity” as a medical illness, fat liberation viewed bodies through a social justice lens and moved to combat anti-fat attitudes and discrimination.⁵⁶ The movement has drawn from both feminist and queer activism.^{57,58}

In her book “Fat Activism,” Charlotte Cooper examines the proxies that are often used to define the activist work of fat liberation, as well as provides a more thorough definition of the multifaceted nature of this work, merging her own experiences as an activist as well as themes from unstructured interviews she conducted with individuals who identify as fat activists. Before

providing this definition, she identifies several proxies that are common misconceptions about the activist work of fat liberation. Two misconceptions relevant to this dissertation are: 1) equating fat liberation to body positivity, and 2) assuming that the prevention of disordered eating and body dissatisfaction are the primary goals of fat liberation. She argues that despite the relevance of fat activism to these issues, these concerns miss the mark by obscuring the focus of fat activist work. Cooper observed that the upbeat nature of body positivity, in its self-love and self-acceptance, can miss the mark on the broader political implications of fat liberation. She also argues that while there are important and necessary conversations to be had about fatness and body image, reducing fat liberation to the prevention of disordered eating and body image disturbance can obscure the true message. Instead, Cooper provides a more nuanced definition that incorporates these proxies:

“Fat activism is self-acceptance, it’s about being body positive, it’s campaigning for social change, it’s challenging stigma, it’s about eating, it’s about health, it’s negligible. But I have argued that these are merely proxies for a movement that is much more expansive and sophisticated than it has been given credit for...what is fat activism? I think of it as being potentially limitless but here I will discuss some of the forms...these include political process activism, which means the kind of things that most people in the West think of as activism; community-building, cultural work, micro fat activism, which takes place in very small social spaces; and ambiguous activism (p.51).”⁵⁹

Cooper’s reflections on fat liberation point to a politically charged movement, one that is charged with not only unpacking societal stigmas about fat bodies, but also a movement that is based on combating discrimination, incorporating issues related to race and gender, and creating cultural capital for fat individuals. While reducing disordered eating and improving body

satisfaction in those in larger bodies may be worthwhile goals, fat activism extends beyond this proxy.

With the advent of the internet, online spaces provide those doing fat liberation work with a new home to share ideas, organize, and create community. One author, who identifies as fat, describes the importance of fat liberation community in online spaces. She emphasizes that the “Fat-o-sphere” is a place where she can build community with other fat individuals and shop for clothing that cannot be found in brick and mortar retail stores, and that the modern internet allows you to be both an information user as well as information producer with formats like blogs, social networking sites, etc.⁶⁰ It should also be noted that most of the online spaces dedicated to fat liberation are created by women.⁶¹ In a thematic analysis of four online websites dedicated to fat liberation, researchers found that fat women used these spaces to discuss challenging beauty standards, fat as a lifestyle, and fat politics.⁶²

Stemming from but not completely mirroring fat liberation, the more modern Body Positivity Movement has found a home within the wide reach of social networking sites. The online Body Positivity Movement upholds beliefs including the promotion of body inclusivity and body acceptance, as well as the rejection of societal ideals around weight and shape. Simone Meyer writing for The Body Positive Alliance defines it as such:

“Body positivity is the assertion that all people deserve to have a positive image of their body, regardless of how society and popular culture conveys appearance ideals. The body-positive movement, specifically, recognizes sexuality, race, gender, and ability as factors that affect body image, but maintains an overall focus on the influence of body size. The movement challenges unrealistic beauty standards to promote the widespread acceptance of all bodies.”⁶³

Early research examining the role of the Body Positivity Movement (hereafter referred to as “body positivity”) as a protective factor against risk for disordered eating has been promising. In a study of young adult men and women utilizing Ecological Momentary Assessment, exposure to body positivity on social networking sites was associated with increased body satisfaction as well as increased positive affect.⁶⁴ In an experimental research design, young women exposed to body positive content have shown increases in positive affect and less body dissatisfaction and thin ideal internalization compared to peers exposed to more traditional thin ideal images.⁶⁵

Despite research suggesting that body positivity may be beneficial in preventing body dissatisfaction, there are several concerns that exist about body positivity. One concern is the lack of diversity of images in terms of size inclusivity, and the research both supports and refutes this claim. In a recent content analysis of online body positivity on Instagram, researchers found that many of the posts were appearance focused, however, they contained diverse body sizes (i.e., more than two-thirds of images displayed individuals with bodies that were categorized as “overweight” or “obese”) and were consistent with constructs representative of positive body image.⁶⁶ Yet, in an analysis of Instagram posts sourced from publicly available posts, it was found that some images that were tagged as reflecting body positivity actually promoted weight loss or celebrated extreme thinness.⁶⁷ Additional concerns have been raised about the lack of racial or ethnic diversity within body positivity, and the predominance of white, thin to average sized women within the movement. In the aforementioned study of publicly available images sourced from Instagram, white bodies were shown in over two-thirds of the images that contained human bodies.⁶⁷ While this proportion is similar to that of the American population, it does reflect a more diluted view of body positivity, in that it centers bodies that are least marginalized. A more equitable distribution may be a higher proportion of images containing

individuals of historically minoritized racial and ethnic backgrounds. In addition to lack of equitable racial representation, it has been posited that body positivity neglects to address the systemic oppression and unique experiences of being both fat and a person of color, contributing to a predominantly white-focused narrative on body positivity.⁶⁸

While viewing body positivity content may have advantageous effects for young women, there are still many questions that remain regarding how the nature of body positivity content (i.e., how it is defined and the extent to which it retains the original principles of fat activism) may relate to its overall impact. In a study examining perspectives on the current state of cultural body acceptance, eighteen women who reported trying to improve their relationship with their body provided multiple qualitative interviews over the course of one year. While participants commonly mentioned body positivity, fat liberation was rarely, if ever discussed, which was suggested by the authors to be an indication of greater infiltration of body positivity among Midwestern women compared to fat liberation.⁶⁹ Understanding the potential impact of the movement on risk and protective factors for disordered eating as well as anti-fat attitudes requires understanding how body positivity messaging is perceived by social media users and the nature of the body positivity content. This is particularly relevant given the heterogeneity of online body positivity content, which is creator-driven, and therefore, subject to the individual characteristics or beliefs of the creator. Furthermore, the type of body positivity content one is exposed to likely depends on complex computer-generated algorithms. All these things considered, the type of body positivity content one is exposed to may be subject to high variance both within individual viewers and between individual viewers of this content.

General theory and research gaps

The basis for examining body positivity on social networking sites as a potential prevention target for disordered eating risk and anti-fat attitudes rests on the premise that characteristics of body positivity content may be protective. As mentioned previously, there is a growing body of research that points to a positive relationship between exposure to body positivity and body satisfaction. Furthermore, when considering the common definition of body positivity being one of body inclusivity, body appreciation, and rejection of societal ideals, it is likely that body positivity shares multiple components to the construct of positive body image (body acceptance and body confidence, rejection of societal ideals regarding appearance, etc.)²² Positive body image has also been linked to fewer unhealthy dieting behaviors and higher self-esteem.⁷⁰ In a study examining whether components of positive body image were associated with onset of disordered eating symptoms over time, it was found that both body appreciation and body functionality appreciation were associated with lower odds of disordered eating symptoms over time.⁷¹ This dissertation examines how agreement with body positivity is associated with a wide array of outcomes relevant to disordered eating risk, which can provide additional insights into which components of the movement are protective, and which components may be associated with risk.

This dissertation will also examine the relationship between body positivity and anti-fat attitudes, which is a significant gap in the empirical literature. If an association between agreement with body positivity and anti-fat attitudes exists, it may be due to the growing exposure to body diversity within media shifting societal attitudes. This may be explained by Cultivation Theory, in which exposure to media representations of fat bodies and fat liberation may lead to cultivation of an individual's attitudes about fat individuals.⁷² In the case of online

body positivity, exposure to body diversity framed in a positive light could potentially be associated with lower anti-fat attitudes.

It is also important to reflect on the previously mentioned theoretical differences between body positivity and fat liberation. It may be that body positivity and fat liberation are associated with differential outcomes. For this reason, both agreement with mainstream body positivity as well as agreement with a more inclusive version of body positivity and risk and protective factors and anti-fat attitudes will be examined. When reflecting on Cultivation theory, it is possible that media representations of diverse bodies may contribute to more inclusive attitudes about body size. However, one must also consider the pervasive societal weight bias that contributes to anti-fat attitudes.

In addition to examining the associations between body positivity and risk and protective factors, and anti-fat attitudes, the influence of image type of body positive content will be examined via an experimental paradigm in the second half of this dissertation. The first image characteristic that will be manipulated will be the presence of bodies within the image. The presence of bodies has been chosen as target for experimental manipulation due to previously mentioned research on photo-based social media content and risk for disordered eating and body dissatisfaction. The risk of photo-based social media content makes sense when considering Social Comparison Theory, which posits that individuals compare their own abilities and attributes to those of other individuals.⁷³ When viewing images of bodies, young women may compare their body to the body of the image and these social comparisons on appearance have been linked to higher body dissatisfaction.⁷⁴ Due to the artificial and highly edited images present on social media, these women likely are engaging in upward appearance comparisons, in which they compare their body to that of an idealized image. Upward social comparisons can be

linked to an increase in risk factors such as body dissatisfaction and are particularly harmful for those with preexisting body dissatisfaction or related pathology.⁷⁵ It is for these reasons that the presence of bodies within body positivity content has been identified for experimental manipulation.

The second target for experimental manipulation will be the body size portrayed in body positivity content, specifically, either the presence of fat bodies or mid-size bodies (to be further defined in **Chapter 3**). It is hypothesized that body size of image may influence changes in risk factors and protective factors for disordered eating, as well as anti-fat attitudes. The presence of images of individuals in fat bodies may be associated with greater reductions in anti-fat attitudes, possibly due to Cultivation Theory. However, the relationship between viewing images of fat bodies is likely more complex regarding risk and protective factors for disordered eating and may be related to upward or downward appearance comparisons happening at the individual level (see all hypotheses in the following section **Specific Aims**).

Specific Aims

The media play an active and central role in how bodies are viewed and treated. Social networking sites are a unique form of media that has the potential to be utilized as a tool to promote societal acceptance of all types of bodies, and therefore may serve an integral role in preventing disordered eating and body image dissatisfaction. Body positivity, with its large presence on social networking sites is a promising, albeit heterogeneous movement that is well-known in popular culture. It is possible that body positivity may be useful as a preexisting target for intervention in the prevention of disordered eating as well as anti-fat attitudes. Providing an empirical and user-generated definition of the movement will provide unique insight into how individual users define a movement that is heterogeneous in content. Utilizing this user-generated

definition of body positivity (hereafter referred to as mainstream body positivity), this study will examine whether individual agreement with this definition of mainstream body positivity (i.e., the degree to which one personally agrees or disagrees with concepts in the definition) is associated with risk and protective factors for disordered eating as well as anti-fat attitudes. Given the historical roots of body positivity, it is also important to examine what role agreement with fat liberation plays in the relationships between the agreement with mainstream body positivity and risk and protective factors for disordered eating, as well as anti-fat attitudes. Therefore, this study will examine whether associations differ for those who agree with mainstream body positivity (i.e. body positivity with a more aesthetic focus without incorporation of fat liberation) versus those who agree with mainstream body positivity as well as fat liberation.

Aim 1: Characterize how young adult women define the mainstream body positivity movement on social media and create a user-generated definition of the body positivity movement.

Sub-aim 1: Describe whether there is a linear relationship between agreement with mainstream body positivity as defined in Aim 1 and associated risk and protective factors for disordered eating, overall eating disorder risk, and anti-fat attitudes.

H1: Agreement with mainstream body positivity will be associated with lower levels of risk factors for disordered eating (thin ideal internalization, weight bias internalization, and body dissatisfaction), higher levels of body appreciation and body functionality appreciation, and lower eating disorder risk.

H2: Agreement with mainstream body positivity will be associated with higher levels of protective factors for disordered eating (body appreciation, body functionality appreciation).

H3: Agreement with mainstream body positivity will be associated with lower overall eating disorder risk.

H4: Agreement with mainstream body positivity will be associated with lower anti-fat attitudes.

Sub-aim 2: Determine whether complete agreement with mainstream body positivity and fat liberation (versus only mainstream body positivity) as defined in Aim 1 is associated with risk and protective factors for disordered eating, overall eating disorder risk, and anti-fat attitudes.

H1: Complete agreement with mainstream body positivity (compared to less than complete agreement) will be associated with lower levels of thin ideal internalization and body dissatisfaction; higher levels of body appreciation and body functionality; and lower eating disorder risk.

H2: Complete agreement with mainstream body positivity and fat liberation (compared to complete agreement with body positivity but no agreement with fat liberation) will be associated with lower weight bias internalization and lower anti-fat attitudes.

Aim 1 will be examined via a cross-sectional survey conducted online. A recruitment email will be sent via the Registrar's office at the University of Michigan to two separate batches of 2500 individuals. Individuals will be eligible to complete the full survey if they meet the following inclusion criteria: 1) identify as female, 2) are between 18-25 years of age, 3) currently enrolled at the University of Michigan, and 4) can read English fluently.

Aim 2: Determine if exposure to body positivity content with or without the presence of bodies via social networking sites compared to neutral control images is associated with risk and protective factors for disordered eating, such as state body satisfaction (i.e., state

weight satisfaction, state shape satisfaction, state appearance satisfaction), body functionality appreciation, and anti-fat attitudes.

H1: Relative to *control* images, exposure to *words only* body positivity content will be associated with increases in state body satisfaction measures and body functionality appreciation and decreases in anti-fat attitudes measured pre-post exposure for disordered eating.

H2: Relative to *control* images, exposure to images of *general bodies* + *words* body positivity content will be associated with increases in state body satisfaction and body functionality appreciation and decreases in anti-fat attitudes measured pre-post exposure for disordered eating.

H3: Relative to images of *general bodies* + *words*, exposure to *words only* body positivity content will be associated with increases in state body satisfaction and body functionality appreciation and decreases in anti-fat attitudes measured pre-post exposure for disordered eating.

Aim 3: Determine if exposure to body size variations in body positivity content (1-images of *mid-size bodies* + *words*, 2-images of *fat bodies* + *words*, 3- images of *general bodies* + *words* via social networking sites is associated with risk factors and protective factors for disordered eating such as state body satisfaction (i.e. state weight satisfaction, state shape satisfaction, state appearance satisfaction), body functionality appreciation, and anti-fat attitudes.

Exploratory sub-aim: Examine whether race/ethnicity and weight perception may moderate the association between exposure to body positivity content via social networking sites and risk and protective factors for disordered eating and anti-fat attitudes.

H1: Exposure to *fat bodies* + *words* body positivity content will be associated with a reduction in anti-fat attitudes measured pre-post exposure, relative to *mid-size bodies* + *words*.

H2: All experimental conditions will be associated with a reduction in body dissatisfaction.

H3: All experimental conditions will be associated with an increase in body functionality appreciation.

Aims 2 and 3 will be studied in an experimental design enrolling a minimum of 200 undergraduate students between 18 to 25 years of age who identify as female and can read English fluently. Participants will be randomly assigned to one of five conditions: 1) *control* condition of inspirational quotes; 2) *words only* body positivity content; 3) images of *general bodies* + *words* body positivity content; 4) images of *fat bodies* + *words* body positivity content; and 5) images of *mid-size bodies* + *words* body positivity content. Participants will answer a battery of measures pre- and post- exposure to assess risk and protective factors for disordered eating, such as state body satisfaction (i.e. state weight satisfaction, state shape satisfaction, state appearance satisfaction), body functionality appreciation, and anti-fat attitudes.

Public health implication

Body ideals conveyed through social media are implicated in the genesis of body dissatisfaction, weight bias internalization, and disordered eating, all of which have profound negative effects on a person's health and well-being. Young adult women, in particular, are vulnerable to these consequences.⁵ While there have been numerous interventions aimed at increasing media literacy and reducing body dissatisfaction in young women, most of this work has focused on thin ideal internalization and has failed to focus on risk and protective factors such as weight bias internalization and positive body image. Further, individually focused interventions have limited reach and, thus, limited potential to change norms. Accordingly, population-based strategies or scalable approaches should be explored. The online body positivity movement has shown promise in the context of eating disorder risk but remains understudied relative to its impact on anti-fat attitudes that contributed to both the internalization

and overt expressions of weight bias. Examining/utilizing an ongoing social movement in an ever-changing media environment as a prosocial agent of change has widespread potential to change norms and have a sustainable impact on public health.

This dissertation aims to not only provide data on how young adult women define modern body positivity, but to explore how exposure to body positivity content is associated with disordered eating risk and anti-fat attitudes. Understanding how body positivity is similar and dissimilar to the fat liberation movement from which it stems can provide important data about how to craft messages that are more inclusive to the bodies that the movement is theoretically meant to benefit. Given that the field of public health currently places a high focus on the prevention and treatment of obesity,⁷⁶ findings from this work will have widespread application related to the impact of framing/messaging related to body size and to reducing weight bias and its associated adverse health outcomes.

Chapter 2 : Defining Body Positivity and Cross-sectional Associations between Body Positivity, Fat Liberation, and Risk and Protective Factors for Disordered Eating and Anti-fat Attitudes

The body positivity movement (hereafter referred to as body positivity) originated from the fat liberation and activism movement of the 1960s. While fat liberation aims to reduce the discrimination and the medicalization of fat bodies, modern day body positivity has appeared to stray from its mother movement with a greater focus on appearance and body acceptance. Modern day body positivity has a large presence within social networking sites, and early research suggests that its content may be helpful in combatting risk factors for disordered eating. Little is known, however, about how the movement may be related to anti-fat attitudes. Furthermore, there is no existing unified, empirically derived, and user-generated definition of body positivity, which is a significant gap in the existing research base. Therefore, this study will contribute a user-generated definition of body positivity. Utilizing this definition, this study will also examine the association between agreement with body positivity and risk factors and protective factors for disordered eating and anti-fat attitudes.

History of fat liberation and the modern body positivity

Modern day body positivity can be traced back to the fat liberation and fat activism movement originating in the 1960s. Fat liberation aimed to reduce the discrimination of marginalized bodies, particularly fat bodies, and to question the currently held belief that fatness is undeniably linked to health.⁷⁷ The relationship between weight status and physiological health is complex and outside of the scope of this dissertation, however, understanding differences

between fat liberation and modern day body positivity is essential in examining how these belief systems are associated with disordered eating risk and anti-fat attitudes.

Around the turn of the century, marketing campaigns arose that were beginning to challenge mainstream beauty ideals. One of the first body positivity marketing campaigns can be traced back to the late 1990s with The Body Shop's "Ruby" Campaign. This campaign was set in contrast to the dominant belief in the fashion industry, that one should strive towards a set beauty ideal – one of thinness. Notably, the original "Ruby" advertisement did not feature any products, rather it was an advertisement of a Rubenesque nude doll, "Ruby," lounging on a green velvet sofa with the headline "There are 3 billion women who don't look like supermodels and only 8 who do."⁷⁸

Modern day body positivity started to move into online spaces in 2010, when fat women began to create a virtual presence in online spaces such as Tumblr, private Facebook groups, and online blogs, where they began to challenge the widespread negative narratives related to fat bodies. In these online spaces, fat women found community and a space where they could celebrate their bodies rather than disparage them.⁷⁹ Further, fat women were able to produce their own content in these spaces that allowed them agency related to the portrayal of their bodies, which could counteract the stereotypical and negative representations of fat bodies.⁸⁰ As social media platforms proliferated, more spaces were available for fat women to consume and produce their own social media content, potentially increasing the impact of the message.

While body positivity arose out of a need to protect those with marginalized bodies, especially those with fat bodies, it has evolved into a societal movement that focuses more on the promotion of self-love and the aesthetic appreciation of all bodies. In this way, the movement morphed into one that was principally focused on appearance, rather than on the importance of

protecting fat people from size discrimination and harm.⁷⁷ There is heterogeneity of body positivity content that reflects a variety of perspectives, ranging from beliefs rooted in fat liberation to beliefs focused primarily on acceptance of perceived aesthetic flaws. In a discourse analysis of online blogs written in the body positivity space, researchers identified four separate frameworks of body positivity: 1) mainstream body positivity, 2) fat positivity equals body positivity, 3) radical body positivity, and 4) body neutrality.⁸¹ This dissertation builds on this analysis in that it provides further information on how users themselves frame body positivity. Examining how social networking users define the online body positivity is important as the movement is creator driven, evolving, and highly-variable, due to both the complex nature of social networking site algorithms as well as an individual's ability to follow/unfollow content based off of personal preferences.⁸²

Research suggests that modern day body positivity still reflects a more normative view of beauty and may not be for *every body*. In an analysis utilizing critical discourse analysis and critical technocultural discourse analysis, Hage examined which discourses are portrayed through body positivity social media posts and how they disrupt current oppressive discourse. Hage posited that body positivity discourse can contribute to a broader appreciation of body sizes, as well as demanding humane treatment of folks in all bodies. However, Hage suggested that the movement still could contribute to current beauty standards, rather than dismantling them, due to underlying messages that suggest that body-acceptance is achievable only for larger bodied women who are highly feminine or in line with cultural norms of attractiveness.⁸³ The implications of Hage's work suggest that the nature of body positive content may be related to its impact. It may well be that the type of body positive content is what drives the relationships between body positivity and outcomes such as disordered eating risk and anti-fat attitudes.

Body positivity and disordered eating

There is a growing body of research that demonstrates that exposure to body positivity content may have beneficial effects on risk factors relevant to the development of eating disorders. In a naturalistic study design utilizing momentary assessment, young adults who were exposed to body positivity content reported higher levels of body satisfaction, lower negative affect, and higher positive affect.⁶⁴ In one of the first experimental study designs on body positivity involving 195 young women, those who were randomly allocated to view body positivity images had increases in body satisfaction, body appreciation, and positive affect, compared to their peers who viewed either thin idealized content or appearance neutral content.⁶⁵ In an experimental study design of over 400 women, there was a significant interaction between viewing body positivity content and weight perception, in that those who perceived their weight to be within normal limits had higher appearance satisfaction after viewing body positivity content.⁸⁴ This study suggests that there are individual differences in the impact of body positive content and, worryingly, that it may not have a positive affect for the individuals of larger body sizes who experience the most social marginalization.

Body positivity and anti-fat attitudes

The evidence to support the body positivity as a tool for the reduction of anti-fat attitudes is still limited and conflicting, although experimental studies utilizing actual advertising campaigns suggest that it may be helpful in improving acceptance of diverse body sizes. In an experimental study design, over 400 female participants were randomized to view one of five advertising campaigns, two of which were relevant to body positivity (i.e., Aerie and Dove Beauty Campaign), and were assessed on both explicit anti-fat attitudes as well as internalized attitudes and weight. Participants in the Aerie condition displayed a significant decrease in

specific anti-fat attitudes (i.e., dislike of fat people), but no changes were found for internalized weight bias or global anti-fat attitudes. However, when explicitly asked about acceptance of diverse body sizes, those in the two body positive conditions did endorse higher acceptance of diverse body sizes.⁵⁴

Theory and research gaps

Counterconditioning has shown promise in changing other commonly negative held beliefs about marginalized groups of people, such as those of minoritized racial identities.⁸⁸ Body positivity, in its quest to promote body acceptance of more diverse bodies, may act as a form of counterconditioning to societal norms regarding body weight. This mechanism has been examined in counterconditioning studies that aimed to change stereotypical attitudes about weight, but the research on counterconditioning on anti-fat attitudes is limited and conflicting. In a study using medical students, an intervention group was exposed to multiple forms of counterconditioning on the causes of obesity, such videos of an individual relating their experience of stigma, doctor-patient role playing, and a list of facts and figures. In the intervention group, there was a reduction in anti-fat attitudes including a reduction in the belief about the controllability of one's weight.⁸⁵ While this result is promising, findings from this study of medical students may not be generalizable to the general public. In a second study that utilized counterconditioning by presenting videos of those with larger bodies in a positive, non-stereotyped light, the results on both implicit and explicit bias were null.⁸⁶ A third experimental study of both men and women found that exposure to positive images of larger bodied celebrities and non-celebrities did not have a significant impact on anti-fat attitudes.⁸⁷

While early data demonstrate that body positivity may be helpful in improving certain risk factors (i.e., body dissatisfaction and negative affect), little is known about how the

movement is associated with a wider array of risk and protective factors for disordered eating, as well as with anti-fat attitudes. Furthermore, there is no existing unified and empirically derived user-generated definition of body positivity, which is a significant gap in the existing research base. Body positivity remains poorly defined, in part because the content is creator- and user-driven with algorithm-based and opt-in components, and thus different users may engage with or be exposed to different content within the movement. To scientifically evaluate the relationships between body positivity and outcomes relevant to disordered eating and anti-fat attitudes, it is imperative to define the movement through the eyes of the population we are studying. Furthermore, body positivity is derivative of fat liberation, yet there is little evidence examining how agreement with fat liberation content is associated with outcomes related to disordered eating risk and anti-fat attitudes. Considering the heterogeneity of body positive content, identifying how users identify with both the mainstream perspectives of body positivity, as well as fat liberation, is a critical step in understanding how content of the movement is related to disordered eating risk.

Study objectives and hypotheses

Aim 1: Characterize how young adult women define the mainstream body positivity movement on social media and create a user-generated definition of the body positivity movement.

Sub-aim 1: Describe whether there is a linear relationship between agreement with mainstream body positivity as defined in Aim 1 and associated risk and protective factors for disordered eating, overall eating disorder risk, and anti-fat attitudes.

H1: Agreement with mainstream body positivity will be associated with lower levels of risk factors for disordered eating (thin ideal internalization, weight bias internalization, and body

dissatisfaction), higher levels of body appreciation and body functionality appreciation, and lower eating disorder risk.

H2: Agreement with mainstream body positivity will be associated with higher levels of protective factors for disordered eating (body appreciation, body functionality appreciation).

H3: Agreement with mainstream body positivity will be associated with lower overall eating disorder risk.

H4: Agreement with mainstream body positivity will be associated with lower anti-fat attitudes.

Sub-aim 2: Determine whether complete agreement with mainstream body positivity and fat liberation (versus only mainstream body positivity) as defined in Aim 1 is associated with risk and protective factors for disordered eating, overall eating disorder risk, and anti-fat attitudes.

H1: Complete agreement with mainstream body positivity (compared to less than complete agreement) will be associated with lower levels of thin ideal internalization and body dissatisfaction; higher levels of body appreciation and body functionality; and lower eating disorder risk.

H2: Complete agreement with mainstream body positivity and fat liberation (compared to complete agreement with body positivity but no agreement with fat liberation) will be associated with lower weight bias internalization and lower anti-fat attitudes.

Method

Preliminary Qualitative Data Collection – MyVoice

To gain a better understanding of how young adults define body positivity, qualitative data were collected from the MyVoice Cohort.⁸⁹ The MyVoice Cohort is a national text messaging cohort of young adults between 12-25 years of age, aimed to be in line with

American Census Data for a more nationally representative sample.⁸⁹ Participants were asked the following question: “*How would you define the body positivity movement?*”

Via thematic analysis, three members of the study team separately identified themes present in the responses. Inclusion criteria for thematic analysis were MyVoice participants who identified as female and were between 18-25 years of age. Upon consensus of common themes, a codebook was developed so that responses could be coded by two independent research assistants (Appendix A). Intercoader agreement was deemed acceptable when agreement reached 80% or higher indicating substantial or nearly perfect agreement.⁹⁰

Development of Body Positivity Definitions

Utilizing participant responses from the qualitative analysis of the MyVoice Cohort, we identified ten common themes that reached intercoder agreement of at least 80%. These themes were used to generate definitions of body positivity to quantitatively assess how participants defined the body positivity movement in a cross-sectional survey design. Definitions were reviewed for face validity by the primary research team as well as by The Sonnevile Lab for Weight Inclusive Nutrition during the 2019-2020 academic year and can be found under the ***Survey*** subheading below.

Recruitment

An initial email was sent out via the Registrar’s Office to 2500 students enrolled at the University of Michigan. Participants were eligible to complete the survey if they met the following criteria: 1) identified as female gender, 2) were between the age of 18-25 years old, 3) currently enrolled at the University of Michigan, and 4) could read English fluently. A second round of recruitment followed the same protocol, but the recruitment email went out to a new and distinct set of 2500 students.

Survey

Demographics. Demographic data was collected on participant age, gender identity, race/ethnicity, parental income, and sexual orientation.

Body Positivity Definitions. Utilizing the themes generated from the MyVoice cohort qualitative data, 10 individual definitions of body positivity were drafted. Participants were provided the following directions: “The following questions are meant to provide you with DEFINITIONS of the Body Positivity Movement. Please rate the degree that you think each statement DEFINES OR DESCRIBES the Body Positivity Movement. DO NOT rate the degree that you PERSONALLY agree with the statement.” Utilizing the base statement “The Body Positivity Movement is...” the following ten statements were listed: 1) “about appreciating diverse body types, i.e. bodies of all weights, shapes, and sizes,” 2) “about accepting your body the way that it is,” 3) “about loving and embracing your body or feeling confident in your body the way that it is,” 4) “about not shaming or judging someone because of their body weight, shape, or size,” 5) “about rejecting societal ideals about beauty or appearance,” 6) “about rejecting societal ideals about body weight, shape, and size,” 7) “about prioritizing health over the way that your body looks,” 8) “about promoting obesity,” 9) “about promoting unhealthy lifestyles,” and 10) “about shaming thin people.” Participants were provided the five following response options: 1) “Does not describe the Body Positivity Movement,” 2) “Describes the Body Positivity Movement slightly,” 3) “Describes the Body Positivity Movement somewhat,” 4) “Describes the Body Positivity Movement moderately,” and 5) “Describes the Body Positive Movement extremely.”

Body Positivity Agreement. Utilizing the themes generated from the MyVoice cohort qualitative data, 10 individual statements assessing personal agreement with the definitions were drafted. Participants were provided the following directions: “The following questions are meant to ask your PERSONAL OPINIONS about body positivity. Please rate the degree that you PERSONALLY AGREE with each of the following statements.” The statements listed were as follows: 1) “I believe that people should accept diverse body types, i.e. bodies of all weights, shapes and sizes” (“body diversity”), 2) “I believe that people should accept their bodies the way that they are” (“body acceptance”), 3) “I believe that people should love and embrace their bodies and feel confident in their bodies the way that they are” (“body love and confidence”), 4) “I believe that people should not shame or judge anyone because of their body weight, shape, or size” (“no body shaming”), 5) “I believe that people should work towards rejecting societal ideals about beauty or appearance” (“rejecting beauty ideals”), 6) “I believe that people should work towards rejecting societal ideals about body weight, shape, and size” (“rejecting body size ideals”), 7) “I believe that people should prioritize health over the way their bodies look” (“prioritize health”), 8) “I believe that it is okay for people to be obese” (“fat liberation”), 9) “I believe that it is okay for people to be unhealthy” (“unhealthy”) and 10) “I believe that it is okay for people to shame thin people” (“thin shaming”). Participants were asked to rate the degree to which they agreed or disagreed with those statements utilizing a five-point Likert-scale, with the midpoint being “neither agree nor disagree.”

Risk Factor Scales

Weight Bias Internalization. Weight bias internalization (measured here via the Weight Bias Internalization Scale-Modified (WBIS-M)) has been linked to higher levels of eating disorder psychopathology such as weight and shape concern.⁹¹ The original WBIS was developed to measure the extent to which individuals applied stereotypes regarding weight to their own self-evaluations,⁹² and was later validated to measure this in individuals of all body weights (WBIS-M).⁹³ The scale has strong internal consistency and convergent validity.⁹⁴ It has been linked to both poorer mental and physical health.⁹⁵ It has also been demonstrated that the WBIS-M has acceptable psychometric properties when utilizing self-perceived weight status or Body Mass Index (BMI).⁹⁶ Cronbach's alphas for all risk factor, protective factor, and anti-fat attitude measures can be found below in the results section.

Thin ideal Internalization. Thin ideal internalization was measured via the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3). The SATAQ-3 is a measure of the degree to which one endorses societal ideals about appearance. For the purpose of this study, the General Internalization subscale was chosen. The SATAQ-3 has strong convergent validity with measures of body image and eating pathology.⁹⁷ In the current study, the term "screen media" was used for questions that utilized the term "television" or "movies," to reflect current viewing practices.

Body Dissatisfaction. Body dissatisfaction was measured via the Eating Disorder Inventory-Body Dissatisfaction Subscale (EDI-BD). The original EDI measures both psychological and behavioral traits associated with eating disorders.⁹⁸ For the purposes of this study, the Body Dissatisfaction Subscale was utilized to examine body dissatisfaction with body parts such as thighs, stomach, buttocks, etc.

Protective Factor Scales

Body Appreciation. The Body Appreciation Scale (BAS) is a measure of body appreciation, an aspect of positive body image that measures an individual's respect, acceptance, and favorable opinions towards their body. It has acceptable construct validity, convergent validity, and internal consistency.⁹⁹ The BAS-2 was developed by the original authors and chosen based on item refinement that improved all aspects of validity and test-retest reliability.¹⁰⁰

Body Functionality Appreciation. Body functionality appreciation is the construct of appreciation of the various functions that the body performs and is considered an aspect of positive body image. In this study it was assessed via the Functionality Appreciation Scale (FAS). The FAS displayed adequate construct, criterion related and incremental validity.¹⁰¹

Overall Eating Disorder Risk

Eating disorder risk was assessed via the Eating Disorder Examination Questionnaire-Short Form (EDE-QS). The EDE-QS is a 12-item short form of the original Eating Disorder Examination Questionnaire that has adequate sensitivity at differentiating between individuals with or without eating disorders. It has demonstrated high internal consistency, temporal stability, and is highly correlated with the full EDE-Q.¹⁰²

Anti-fat Attitudes

Anti-fat attitudes were measured via the Fatphobia Scale-Short Form (Fatphobia-SF). Fatphobia can be defined as negative attitudes about fat people or a pathological fear of fatness.¹⁰³ The Fatphobia-SF is a 14-item scale that has demonstrated excellent reliability and is correlated with the original Fatphobia Scale.¹⁰⁴

Statistical Analysis Aim 1

Descriptive statistics. Descriptive statistics were run on all demographic variables including age, race/ethnicity, parental education, sexual orientation, gender identity and weight perception. For the variable of race/ethnicity, participants were coded as “Hispanic” if they only select “Hispanic” or if they select “Hispanic” along with any other racial selection. If participants selected any other combination of racial/ethnic categories, they were coded as “mixed race.” Participants with incomplete data on any of the demographic variables except for gender identity were not included in the analyses. As there was not enough power to look at differences between different gender identities, gender identity is reported in the demographic section, but is not included in statistical models.

Bivariate statistics. Descriptive statistics were provided for each individual Body Positivity definition and agreement item. Bivariate statistics such as chi-squared tests and Fischer’s exact tests were conducted to examine if there were differences in how body positivity was defined as well as agreement with body positivity by demographic characteristics such as race/ethnicity, sexual orientation, parental education, and weight perception. Each Body Positivity definition was condensed into a binary variable (“Describes the Body Positivity Movement extremely” versus all other response options), as was agreement with body positivity variables (“Strongly agree versus all other options). These binary variables were created to maximize statistical power, as responses other than “strongly agree” and “agree” were relatively rare. For the bivariate analyses and to adequately power analyses to examine differences by race/ethnicity, racial/ethnic categories were categorized into “White (non-Hispanic),” “Asian American or Pacific Islander,” and “Other (all other racial categories). In Table 2.1, a more nuanced breakdown of race/ethnicities can be found for all participants. While this study

included a large proportion of participants who identified as “White (non-Hispanic) and “Asian American or Pacific Islander, the final sample included very few participants who identified as African American or Black, Arab American or Middle Eastern, Hispanic or Latinx, or mixed race (non-Hispanic). To examine differences on body positivity variables by race/ethnicity, the groups were collapsed as mentioned above. For weight perception, the following variable was created “Normal weight or under normal weight,” “Overweight,” “Very overweight or obese.” Sexual orientation categories were combined as follows: “heterosexual,” “homosexual,” or “other.”

Means and standard deviations were reported for the entire sample as well as by demographic categories for all risk factors (WBIS-M, SATAQ-3, EDI-BD), protective factors (BAS, FAS), overall eating disorder risk (EDE-QS), and anti-fat attitudes (Fatphobia-SF). The internal consistency of each risk factor scale was examined in the current study population and a correlation matrix was conducted for all risk factors. One-way analyses of variance (ANOVA) were conducted to examine if there were differences in individual means between the above scales and demographic characteristics such as race/ethnicity, parental education, sexual orientation, and weight perception. Levene’s tests were used to check for equality of variances. For any results that violated the assumption of equality of variance, an independent sample Kruskal-Wallis test was run to confirm the results. As there was little power to examine the association between multiple levels of gender identity and risk factor scores, an independent t-test was conducted to look at differences between gender identity, defined as cisgender female versus other (transgender female, nonbinary, or other) and risk factors. Race/ethnicity, sexual orientation, and weight perception were collapsed as previously mentioned to maximize power.

Statistical Analysis Sub-aim 1

Linear regression models. To examine if a linear relationship exists between agreement with mainstream body positivity and risk factors, protective factors, overall eating disorder risk, and anti-fat attitudes, a continuous, cumulative score of agreement with mainstream body positivity was calculated based on the 5-point Likert responses to the following items: 1) “I believe that people should accept diverse body types, i.e. bodies of all weights, shapes and sizes” (“body diversity”), 2) “I believe that people should accept their bodies the way that they are” (“body acceptance”), 3) “I believe that people should love and embrace their bodies and feel confident in their bodies the way that they are” (“body love and confidence”), 4) “I believe that people should not shame or judge anyone because of their body weight, shape, or size” (“no body shaming”), 5) “I believe that people should work towards rejecting societal ideals about beauty or appearance” (“rejecting beauty ideals”), 6) “I believe that people should work towards rejecting societal ideals about body weight, shape, and size” (“rejecting body size ideals”), and 7) “I believe that people should prioritize health over the way their bodies look” (“prioritize health”). Cumulative scores on Items 1-7 ranged from 7-35. Unadjusted linear regression models were run with the continuous score on agreement with mainstream body positivity as the predictor variable and each risk factor as a continuous outcome variable. Each model was further adjusted for age, race/ethnicity, socioeconomic status measured via parental education, and weight perception.

Statistical Analysis Sub-aim 2

Bivariate analyses. To examine if complete agreement with mainstream body positivity was associated with risk and protective factor for disordered eating, overall eating disorder risk, and anti-fat attitudes, a binary variable that represented complete agreement with mainstream body positivity (cumulative score on Items 1-7 of 35) was created. Independent t-tests were used

to compare the means between those who expressed complete agreement with mainstream body positivity versus those who do not express complete agreement.

To examine if agreement with fat liberation was associated with risk and protective factors for disordered eating, overall disordered eating risk, and anti-fat attitudes, agreement with fat liberation was defined as participants who answered “agree” or “strongly agree” to the following item: “I believe that it is ok for people to be obese.” Independent t-tests were run to compare risk factor means between those who expressed agreement with fat liberation versus those who did not express agreement.

Among those with complete agreement with mainstream body positivity, the associations between agreement with fat liberation and risk and protective factors for disordered eating, overall eating disorder risk, and anti-fat attitudes were examined using independent t-tests. Risk factor means of those who expressed complete agreement with both mainstream body positivity and fat liberation (score of 35 on composite mainstream body positivity variable and “agree” or “strongly agree” with fat liberation) were compared to those who only expressed incomplete agreement with body positivity by selecting “neither agree nor disagree,” “disagree,” or “strongly disagree” on the fat liberation item.

Results

Description of the study sample and body positive definitions – Aim 1

Of the 5000 individuals sent recruitment emails, 495 were eligible to complete the full survey based off meeting the inclusion criteria. Of those eligible, all those with incomplete demographic data were excluded, leaving 379 participants. The mean +/- SD age of participants was 20.1 +/- 1.80 years. All other demographic data can be found in Table 2.1.

The extent to which participants felt that each individual definition described the body positivity movement (somewhat, moderately, extremely) is shown in Figure 2.1. Few differences in perceived definitions were seen according to participant characteristics, although participants with an “other” race/ethnicity were more likely to perceive body positivity as a movement that is about “rejecting societal ideals about beauty or appearance” (59.7%) compared to those who identified as white (46.6%) and of those who identified as Asian American or Pacific Islander (34.6%), with a significant statistical difference $\chi^2(2, n=375) = 8.59, p=0.011$, but this was not seen in the post hoc-analysis. No other significant differences between race/ethnicity were detected. There were two significant differences between sexual orientation and individual body positive definitions. Those who identified as heterosexual were significantly more likely to define body positivity as a movement that was about the “acceptance of body diversity” relative to those who identified as a sexual orientation other than heterosexual (79.1% vs 69.7%, $p<0.05$). Those who identified as heterosexual were also more likely to define body positivity as a movement that was about “not body shaming” relative to those who identified as a sexual orientation other than heterosexual (77.3% vs 67.8%, $p<0.05$).

Cronbach’s alphas for all risk and protective factor scales were as follows: BAS-2 ($\alpha = 0.94$), FAS ($\alpha = 0.91$), SATAQ-3 General Internalization ($\alpha = 0.92$), WBIS-M ($\alpha = 0.94$), EDI-BD ($\alpha = 0.67$), EDE-QS ($\alpha = 0.91$), and Fatphobia-SF ($\alpha = 0.84$). Pearson correlations between the risk and protective factor scales were in the expected direction, see Tables 2.2. There were several significant results for all one-way ANOVAs conducted to look at differences between demographic characteristics and risk factor means, which can be found in Table 2.3. No significant differences were found between racial category and WBIS-M, BAS-2, SATAQ-3 General Internalization, FAS, or EDI-BD. Significant between group differences between weight

perception and WBIS-M, BAS-2, and FAS means were seen. For WBIS-M, those who considered themselves normal weight or below had significantly lower levels of weight bias internalization, $M (SD) = 34.2 (14.8)$ than those who considered themselves to be overweight, $M (SD) = 52.2 (14.9)$, $p < 0.001$, and those who considered themselves to be obese, $M (SD) = 73.0 (4.36)$, $p < 0.001$. Those who considered themselves to be overweight had significantly lower scores on weight bias internalization $M (SD) = 52.2 (14.9)$ than those who considered themselves to be obese $M (SD) = 73.0 (4.36)$, $p = 0.008$. No significant differences were found between weight perception and scores on SATAQ-3 or EDI-BD. Significant differences were found between sexual orientation and SATAQ-3, with those who identified as heterosexual having significantly higher levels of thin ideal internalization $M (SD) = 28.6 (7.05)$ than those who identified as homosexual $M (SD) = 21.8 (6.59)$, $p = 0.019$. No other significant differences in risk factor scores were found for sexual orientation. No significant differences were found between gender identity and risk factor scores, or between parental education and risk factor scores.

Body positivity and risk and protective factors – Sub-aim 1

Results for linear regression models utilizing the full five-point scale on agreement with body positivity can be found in Table 2.4. There was a positive association between agreement with body positivity and thin ideal internalization score ($\beta = 0.156$, $p = 0.004$) and body functionality appreciation ($\beta = 0.174$, $p < 0.001$). There was an inverse association between agreement with body positivity and fatphobia scores ($\beta = -0.15$, $p = 0.022$). All other adjusted linear regression models did not reach statistical significance.

Body positivity and fat liberation and risk and protective factors – Sub-aim 2

Results for the associations between mainstream body positivity and fat liberation agreement and risk and protective factor means can be found in Table 2.5. Of the $n=370$

participants with complete data on the composite measure of agreement with mainstream body positivity, $n=215$ (58.1%) had complete agreement with mainstream body positivity and $n=144$ (41.9%) had less than complete agreement with body positivity; no significant differences were found between these groups on risk factor means. Out of $n=215$ participants who had complete agreement with mainstream body positivity, those who also agreed with fat liberation ($n=80$, 37.2%) were compared to those who had no agreement with fat liberation ($n=135$, 60.8%). Those who had complete agreement with mainstream body positivity and agreement with fat liberation had higher scores for body functionality appreciation compared to those who had complete agreement with mainstream body positivity without agreement fat liberation ($p=0.026$). However, when isolating agreement with fat liberation among the $n=378$ participants who responded to this item, several significant differences in risk factor means were seen among the $n=116$ (30.7%) who agreed with fat liberation relative to those $n=262$ (69.3%) with no agreement with fat liberation. Specifically, agreement with fat liberation compared to no agreement with fat liberation was associated with lower scores on fatphobia [M (SD) = 3.18 (0.432), M (SD) = 3.39 (0.512), $p < 0.002$], higher scores on body functionality appreciation [M (SD) = 4.32 (0.562), M (SD) = 4.16 (0.695), $p = 0.042$], and lower scores on the EDE-QS [M (SD) = 8.13 (7.12), M (SD) = 10.4 (8.39), $p = 0.019$].

Discussion

This study examined definitions of the body positivity movement in a cross-sectional survey of undergraduate students between 18-25 years of age who identified as female. The top definitions of body positivity were “body love and confidence,” “appreciation of body diversity,” “not engaging in body shaming,” and “body acceptance.” Other highly agreed with definitions included “rejection of societal ideals regarding weight and appearance” and “prioritization of

health over beauty.” These seven definitions comprise a user-generated definition for mainstream body positivity in this sample. Overall, in adjusted linear models, agreement with mainstream body positivity was positively associated with protective factors against disordered eating such as body functionality appreciation and negatively associated with anti-fat attitudes. Contrary to the hypothesis, agreement with mainstream body positivity was positively associated with thin ideal internalization. No associations were found between complete agreement with mainstream body positivity and any of the outcomes of interest. When isolating agreement with fat liberation, participants who agreed with fat liberation had lower levels of anti-fat attitudes, higher levels of body functionality appreciation, and lower scores on the EDE – QS. Among those who agreed with mainstream body positivity, those who also agreed with fat liberation had higher scores on body functionality appreciation relative to those who did not agree with fat liberation.

There are several published works that examine body positivity and provide conceptual understandings of the movement. The first is the Darwin et al (2020) article that divides contemporary body positivity into four distinct categories: (1) mainstream body positivity, 2) fat positivity equals body positivity, 3) radical body positivity, and 4) body neutrality).¹⁰⁵ The sample in this dissertation endorsed four main definitions (body acceptance, body love and confidence, not engaging in body shaming, and body diversity), which align closely with Darwin’s first category “mainstream body positivity.” The participants in the study at hand also selected “not engaging in body shaming” and appreciation of “body diversity” as definitions of body positivity, however, these are slightly more complicated concepts to categorize. These two definitions may fit well into the concept of mainstream body positivity but may also have some extensions into more fat positive or radical body positivity if individuals agree that not body shaming and appreciation of body diversity should apply to everyone regardless of weight status.

In our study, 30.7% of participants agreed with the item on fat liberation, so there is the potential for this sample to hold more inclusive views regarding body size. Unexpectedly, we observed a positive linear association between agreement with mainstream body positivity and thin ideal internalization. This finding indicates that people may simultaneously support ideas presented within mainstream body positivity while holding beliefs that are antithetical to this movement. It may be that individuals who internalize the thin ideal may aspire to uphold ideas presented by the movement, while not fully embracing those ideas for themselves. Interventions based on cognitive dissonance that encourage participants to explore opposing views such as these have been shown to reduce disordered eating risk factors such as body dissatisfaction and thin ideal internalization.¹⁰⁶ This finding may also support concerns about the aesthetic focus of the contemporary mainstream body positivity.

One particularly notable finding of this study was the association between agreement with fat liberation and lower global eating disorder risk. While agreement with both mainstream body positivity and fat liberation was associated with higher body functionality appreciation and lower fat attitudes, it was agreement with fat liberation that was uniquely associated with lower global eating disorder risk. Due the cross-sectional nature of this data, it is impossible to examine whether agreement with fat liberation leads to lower eating disorder risk, or whether those with lower eating disorder risk are more likely to agree with fat liberation. The cross-sectional nature of this study leads to another possibility. It may be that individuals with higher global eating disorder risk seek out body positivity content to ameliorate cognitive and emotional symptoms of disordered eating such as body dissatisfaction and thin ideal internalization. This could explain why agreement with mainstream body positivity was not associated with lower global eating

disorder risk. Future research should examine this relationship and should explore how to best craft messages within the online body positivity movement to maximize benefit.

To the author's knowledge, this is the first study to empirically examine how young women define the body positivity movement. This study is further unique in its mixed methods approach with the qualitative preliminary data informing the survey that was used to collect quantitative data. While this study has many strengths, it does present with several limitations. As this study is a cross-sectional survey design, it is impossible to examine if a causal relationship exists between body positivity and the selected risk and protective factors. However, the subsequent studies in this dissertation are designed, in part, to answer that question. Furthermore, participants were a convenience sample of undergraduate students who identified as female. However, this study is unique in that it included all participants who identified as female, either cisgender or transgender. While there was a high proportion of students who identified as Asian or Pacific Islander, the sample was still predominantly White with a very small percentage of women who identified as African American or Black. Furthermore, most students viewed their body weight as a normal weight, and therefore we were limited in variability of body size.

One additional limitation is the construction of the item assessing fat liberation. The author's acknowledge potential biases in the crafting of the survey item that was utilized to assess agreement with fat liberation. All survey items assessing definitions of body positivity and agreement with body positivity were crafted utilizing the themes confirmed via the MyVoice qualitative data analysis. It was the author's intention that these items were worded as closely as possible to the actual words used by the MyVoice participants. For this reason, the fat liberation item was written utilizing the term "obese," as this was the terminology utilized by participants.

However, there is a growing body of research as well as concern from activists and researchers that debates the use of medical terminology such as “overweight” or “obese” due to implications for weight bias.^{107,108} Furthermore, “obese” is not a term utilized by the fat activist community.⁵⁸ It may be that use of this terminology deterred some individuals from agreement with the item on fat liberation, which could have biased the estimate. Moving forward, it is essential that language reflects the most inclusive and current usages regarding terminology when measuring agreement with fat liberation or mainstream body positivity.

Results from this study may be useful in identifying components of the modern body positivity movement that may be useful in the prevention of disordered eating and anti-fat attitudes and suggest that beliefs aligned with fat liberation may be more associated with risk of disordered eating and anti-fat attitudes than those typically represented in the mainstream body positivity movement. Implications for the application of this research will be discussed in detail in **Chapter 5**.

Table 2.1: Sample demographics of survey population (n=379)

	N (%)
Age M (SD)	20.1 (1.81)
Race/ethnicity	
White/Caucasian (non-Hispanic)	234 (61.7%)
Latinx or Hispanic	20 (5.3%)
Black or African American (non-Hispanic)	7 (1.8%)
Asian American or Pacific Islander	81 (21.4%)
Arab American or Middle Eastern	11(2.9%)
Mixed Race (non-Hispanic)	26 (6.9%)
Highest parental education	
Less than high school diploma/GED equivalent	4 (1.1%)
High School diploma/GED equivalent	24 (6.3%)
Some college	21 (5.5%)
Associate's degree	14 (3.3%)
Bachelor's degree	105 (27.7%)
Master's degree or advanced degree	211 (55.7%)
Sexual orientation	
Heterosexual	256 (67.5%)
Mostly heterosexual	51 (13.5%)
Bisexual	45 (11.9%)
Mostly homosexual	1 (0.3%)
Homosexual	11 (2.9%)
Other (i.e. asexual, pansexual, etc.)	15 (4.0%)
Gender identity	
Cisgender female	360 (95.0%)
Transgender female	2 (0.5%)
Gender non-binary	4 (1.1%)
Other (excludes cisgender males and transgender males)	4 (1.1%)
Missing	9 (2.4%)
Weight perception	
Very underweight	1 (0.3%)
Underweight	34 (9.0%)
Normal weight	279 (73.6%)
Overweight	60 (15.8%)
Very overweight, obese	5 (1.3%)

Figure 2.1: Body positivity movement definitions for entire sample (n=379)

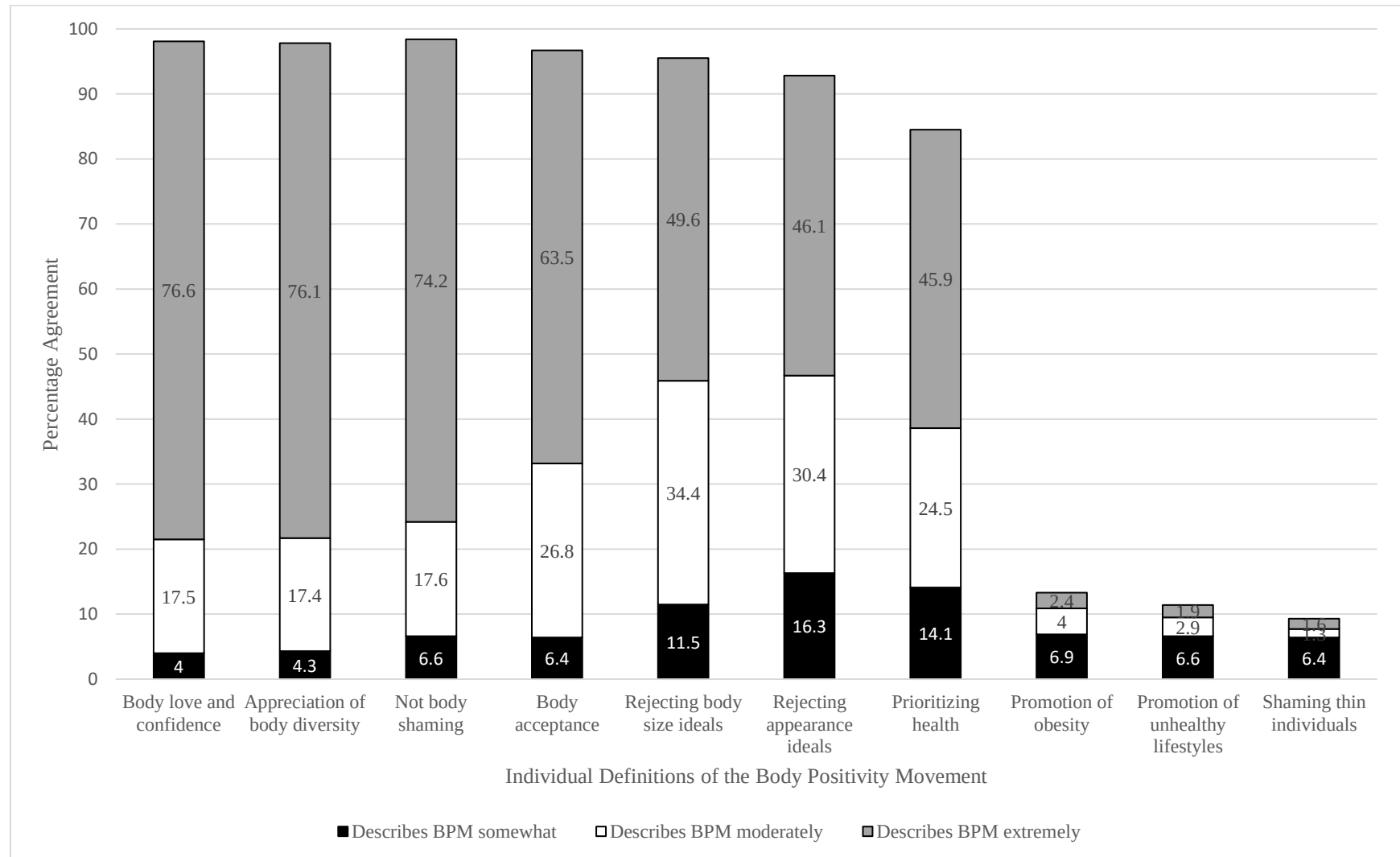


Table 2.2: Correlation matrix of risk and protective factors

	WBIS-M	FAS	EDI-BD	SATAQ3-INT	BAS-2	EDE-QS	Fatphobia-SF
WBIS-M	1.00	-0.457**	-0.734	0.446**	-0.732**	0.794**	0.094
FAS	---	1.00	0.398**	-0.134*	0.591**	-0.389**	-0.093
EDI-BD	---	---	1.00	-0.434**	0.664	-0.628**	-0.132*
SATAQ3-INT	---	---	---	1.00	-0.326**	0.474**	0.193**
BAS-2	---	---	---	---	1.00	-0.622**	-0.010
EDE-QS	---	---	---	---	---	1.00	0.113
Fatphobia-SF	---	---	---	---	---	---	1.00

*Correlation is significant at the $p < 0.05$ level, **Correlation is significant at the 0.01 level

** WBIS-M: Weight Bias Internalization Scale-Modified, FAS: Functionality Appreciation Scale, EDI-BD: Eating Disorder Inventory-Body Dissatisfaction Subscale, SATAQ3-INT: Sociocultural Attitudes Towards Appearance Questionnaire 3-General Internalization Subscale, BAS-2: Body Appreciation Scale-2, EDE-QS: Eating Disorder Examination Questionnaire-Short Form, Fatphobia-SF: Fatphobia Scale-Short Form

Table 2.3 Risk factor means by demographic characteristics

	SATAQ-3 M (SD) (n=333)	EDI-BD M (SD) (n=358)	Fatphobia-SF M (SD) (n=245)	WBIS-M M (SD) (n=358)	BAS-2 M (SD) (n=358)	FAS M (SD) (n=356)	EDE-QS M (SD) (n=323)
Race/ethnicity							
White/Caucasian	28.4 (7.22)	33.1 (6.90)	3.31 (0.511)	37.4 (17.2)	3.47 (0.838)	4.18 (0.681)	9.61 (8.42)
Latinx or Hispanic	25.2 (8.35)	35.3 (6.77)	3.19 (0.629)	38.7 (17.3)	3.52 (1.02)	4.27 (0.579)	9.42 (7.46)
Black/African Am.	31.4 (4.34)	36.7 (5.35)	3.11 (0.152)	32.3 (14.2)	3.76 (0.707)	4.69 (0.382)	6.80 (4.92)
Asian/Pacific Is.	28.0 (8.04)	32.6 (6.760)	3.41 (0.387)	38.4 (15.0)	3.36 (0.747)	4.15 (0.703)	10.1 (7.48)
Middle Eastern	28.0 (8.09)	33.5 (7.39)	3.39 (0.566)	36.1 (19.0)	3.84 (0.732)	4.40 (0.541)	8.20 (9.28)
Mixed Race	27.7 (7.89)	32.7 (6.72)	3.33 (0.498)	39.5 (17.4)	3.54 (0.747)	4.37 (0.404)	10.8 (7.85)
Highest parental education							
< HS Diploma	29.8 (11.8)	35.5 (5.20)	2.88 (0.360)	33.0 (13.0)	2.80 (0.408)	4.46 (0.472)	13.5 (10.5)
HS Diploma/GED	28.9 (9.01)	33.7 (8.12)	3.35 (0.487)	44.1 (18.4)	3.37 (1.02)	4.08 (0.989)	13.3 (11.3)
Some college	25.7 (7.82)	34.3 (6.96)	3.29 (0.457)	31.2 (12.0)	3.72(0.838)	4.33 (0.759)	6.63 (6.05)
Associate's degree	26.7 (5.78)	33.2 (5.79)	3.47 (0.679)	37.8 (15.3)	3.35 (0.801)	4.11 (0.588)	8.23 (6.34)
Bachelor's degree	28.7 (7.82)	32.8 (6.83)	3.35 (0.472)	39.5 (17.9)	3.39 (0.825)	4.11 (0.704)	10.4 (8.76)
Advanced degree	28.0 (7.51)	33.1 (6.81)	3.31 (0.504)	36.8 (16.2)	3.52 (0.789)	4.27 (0.574)	9.24 (7.38)
Sexual orientation							
Heterosexual	28.7 (7.05)	32.9 (6.76)	3.39 (0.516)	36.6 (16.3)	3.52 (0.810)	4.23 (0.620)	9.70 (7.85)
Mostly heterosexual	29.0 (7.43)	33.1 (7.36)	3.26 (0.459)	42.4 (18.1)	3.35 (0.855)	4.11 (0.857)	11.6 (9.80)
Bisexual	27.6 (9.11)	34.0 (6.59)	3.15 (0.449)	40.2 (16.5)	3.40 (0.806)	4.26 (0.665)	10.3 (7.64)
Mostly homosexual	22.0 (0.00)	39.0 (0.00)	3.36 (0.00)	19.0 (0.0)	3.90 (0.0)	3.71 (0.000)	4.00 (0.00)
Homosexual	21.8 (6.59)	33.9 (7.76)	3.22 (0.524)	36.1 (19.8)	3.46 (0.885)	4.34 (4.05)	3.90 (4.95)
Other	23.0 (7.50)	34.4 (6.80)	3.07 (0.171)	35.2 (14.5)	3.35 (0.873)	4.00 (0.720)	6.57 (6.89)
Gender identity							
Cisgender female	28.3 (7.49)	33.1 (6.82)	3.33 (0.505)	37.7 (16.9)	3.49 (0.816)	4.23 (0.655)	9.80 (8.18)
Transgender female	25.5 (20.5)	45.0 (7.07)	3.93 (0.00)	17.5 (3.5)	4.00 (1.13)	4.29 (1.01)	3.50 (0.707)
Gender non-binary	27.3 (6.43)	28.5 (9.57)	3.36 (0.101)	44.8 (8.6)	2.58 (0.443)	3.71 (0.404)	7.00 (6.00)
Other	20.7 (4.93)	34.7 (1.15)	3.43 (0.00)	36.0 (9.2)	3.30 (0.608)	3.62 (0.907)	11.67 (7.51)
Weight perception							
Very underweight	32.0 (0.00)	35.0 (0.00)	3.14 (0.00)	32.0 (0.0)	3.50 (0.00)	4.29 (0.00)	1.00 (0.00)
Underweight	25.6 (7.64)	37.5 (6.26)	3.24 (0.349)	34.6 (15.2)	3.58 (0.884)	4.23 (0.795)	6.81 (8.54)
Normal weight	28.1 (7.20)	33.9 (6.20)	3.32 (0.507)	34.1 (14.8)	3.60 (0.742)	4.27 (0.626)	8.50 (7.23)
Overweight	29.2 (8.67)	28.2 (6.69)	3.40 (0.549)	52.2 (14.9)	2.93 (0.820)	4.01 (0.682)	15.6 (8.15)
Very overweight or obese	30.6 (5.59)	22.0 (4.64)	3.43 (0.258)	73.0 (4.4)	2.10 (0.604)	3.40 (0.509)	22.8 (2.59)

*WBIS-M: Weight Bias Internalization Scale-Modified, FAS: Functionality Appreciation Scale, EDI-BD: Eating Disorder Inventory-Body Dissatisfaction Subscale, SATAQ3-INT: Sociocultural Attitudes Towards Appearance Questionnaire 3-General Internalization Subscale, BAS-2: Body Appreciation Scale-2, EDE-QS: Eating Disorder Examination Questionnaire-Short Form, Fatphobia-SF: Fatphobia Scale-Short Form

Table 2.4: Linear relationships between agreement with mainstream body positivity and risk and protective factors

	B	95% CI	β	t	p
Eating disorder risk factor: Thin ideal internalization (SATAQ 3-General Internalization)					
Unadjusted	0.314 (0.114)	[0.090, 0.538]	0.151	2.76	0.006
Adjusted	0.323 (0.113)	[0.102, 0.545]	0.156	2.87	0.004
Eating disorder risk factor: Body dissatisfaction (EDI-BD)					
Unadjusted	0.062 (0.101)	[-.137, 0.261]	0.033	0.617	0.5389
Adjusted	0.045 (0.092)	[-0.137, 0.226]	0.024	0.483	0.629
Eating disorder risk factor: Global eating disorder risk (EDE-QS)					
Unadjusted	0.000 (0.126)	[-0.248, 0.247]	0.000	-0.002	0.999
Adjusted	0.042 (0.114)	[-0.182, 0.267]	0.019	0.372	0.711
Eating disorder risk factor: Weight bias internalization (WBIS-M)					
Unadjusted	-0.311 (0.248)	[-0.799, 0.177]	-0.067	-1.25	0.211
Adjusted	-0.265 (0.216)	[-0.689, 0.159]	-0.057	-1.23	0.219
Protective factor: Body functionality appreciation (FAS)					
Unadjusted	0.034 (0.010)	[0.014, 0.053]	0.181	3.43	<0.001
Adjusted	0.032 (0.010)	[-0.451, -0.131]	0.174	3.34	<0.001
Protective factor: Body appreciation (BAS-2)					
Unadjusted	0.015 (0.012)	[-0.009, 0.038]	0.065	1.21	0.226
Adjusted	0.012 (0.011)	[-0.009, 0.034]	0.056	1.12	0.263
Anti-fat attitudes: Fatphobia (Fatphobia-SF)					
Unadjusted	-0.024 (0.010)	[-0.044, -0.004]	-0.154	-2.41	0.017
Adjusted	-0.023 (0.010)	[-0.043, -0.003]	-0.150	-2.30	0.022

*WBIS-M: Weight Bias Internalization Scale-Modified, FAS: Functionality Appreciation Scale, EDI-BD: Eating Disorder Inventory-Body Dissatisfaction Subscale, SATAQ3-INT: Sociocultural Attitudes Towards Appearance Questionnaire 3-General Internalization Subscale, BAS-2: Body Appreciation Scale-2, EDE-QS: Eating Disorder Examination Questionnaire-Short Form, Fatphobia-SF: Fatphobia Scale-Short Form

**Adjusted models adjust for age, race/ethnicity, parental education, and weight perception

Table 2.5 Body positivity and fat liberation agreement and risk and protective factor means

		SATAQ-3 INT		EDI-BD		Fatphobia-SF		WBIS-M		BAS-2		FAS-2		EDE-QS	
		M (SD)	p-value	M (SD)	p-value	M (SD)	p-value	M (SD)	p-value	M (SD)	p-value	M (SD)	p-value	M (SD)	p-value
Complete agreement with mainstream body positivity (n=370)	No (n=155)	27.8 (7.23)	0.108	33.3 (6.79)	0.439	3.36 (0.491)	0.156	37.2 (16.1)	0.320	3.50 (0.786)	0.257	4.19 (0.632)	0.712	9.24 (11.3)	0.082
	Yes (n=215)	29.3 (8.19) ^a		32.6 (7.09) ^a		3.25 (0.516) ^a		39.3 (18.5) ^a		3.39 (0.883) ^a		4.22 (0.743) ^a		11.3 (9.42) ^a	
Agreement with fat liberation (n=378)	No (n=262)	27.9 (7.34)	0.564	32.8 (6.92)	0.215	3.39 (0.512)	0.002	38.4 (16.7)	0.206	3.46 (0.833)	0.664	4.16 (0.695)	0.042	10.4 (8.39)	0.019
	Yes (n=116)	28.5 (7.89) ^b		33.8 (6.63) ^b		3.18 (0.432) ^b		36.0 (16.7) ^b		3.50 (0.789) ^b		4.32 (0.562) ^b		8.13 (7.12) ^b	
Agreement with fat liberation among those with complete agreement with mainstream body positivity (n=215)	No (n=135)	27.9 (7.30)	0.056	33.1 (6.79)	0.992	3.34 (0.501)	0.429	37.6 (16.5)	0.846	3.47 (0.816)	0.895	4.17 (0.672)	0.026	9.74 (7.98)	0.927
	Yes (n=80)	30.5 (8.89) ^c		33.1 (7.53) ^c		3.25 (0.477) ^c		38.3 (19.4) ^c		3.49 (0.791) ^c		4.43 (0.516) ^c		9.87 (8.47) ^c	

a: Superscript “a” reflects the M (SD) of those who had complete agreement with body positivity ONLY compared to those who did not have complete agreement

b: Superscript “b” reflects the M (SD) of those who had agreed with fat liberation compared to those who did not agree with fat liberation

c: Superscript “c” reflects the M (SD) of those who had complete agreement with body positivity and fat liberation compared to those who only had complete agreement with body positivity

* WBIS-M: Weight Bias Internalization Scale-Modified, FAS: Functionality Appreciation Scale, EDI-BD: Eating Disorder Inventory-Body Dissatisfaction Subscale, SATAQ3-INT: Sociocultural Attitudes Towards Appearance Questionnaire 3-General Internalization Subscale, BAS-2: Body Appreciation Scale-2, EDE-QS: Eating Disorder Examination Questionnaire-Short Form, Fatphobia-SF: Fatphobia Scale-Short Form

Chapter 3 : The Relationship between Type of Body Positive Image Content and Risk and Protective Factors for Disordered Eating and Anti-fat Attitudes

Social media and disordered eating

The relationship between social media use and risk factors for disordered eating is consistent but complex. Understanding this relationship involves consideration of overall social media use, in addition to type of social media platform and platform features, individual characteristics and behaviors of the user, and exposure to specific social media content.

A positive relationship between both the amount of time spent on social media and frequency of social media use and risk for disordered eating is seen in survey research,²⁸ and this relationship is seen across several individual social media platforms. In a cross-sectional survey of over 900 female university students, researchers found a significant positive correlation between duration of Facebook use and disordered eating risk.¹⁰⁹ In a survey of almost 1000 younger adolescents, disordered eating behaviors and cognitions were positively associated with the number of individual social media accounts held by each participant. This study also found that duration of social media use was associated with eating disorder risk for girls for specific platforms. Specifically, more time spent on Instagram and Snapchat were associated with higher global scores on the Eating Disorder Examination Questionnaire (EDE-Q) and more disordered eating behaviors for girls.³⁰

Characteristics of individual social media platforms may uniquely contribute to disordered eating risk. For example, photo- and video-based social media platforms such as Instagram, Snapchat, and TikTok may be most related to appearance concerns and comparisons. These sites often involve users posting photographs or images of themselves, known as “selfies”, which has been shown to be associated with appearance comparison in a survey of adult women.¹¹⁰ In another survey study of young adult women, higher engagement with photo activities on Facebook was associated with greater thin ideal internalization as well as body surveillance.³³ Furthermore, those who reported higher frequency of following appearance focused accounts on Instagram also reported greater thin ideal internalization, body surveillance, and drive for thinness, compared to those who followed more appearance neutral accounts (i.e. accounts not focused on physical appearance or bodies such as animals, leisure, travel, etc.).³³

Research also supports a relationship between individual social media-based behaviors and risk factors for disordered eating, suggesting that the relationship between social media use and eating disorder risk may have more to do with how the individual is using social media platforms as opposed to use of the platforms themselves. Some studies have found that it may be photo investment or manipulation that carries the most risk. The concept of photo investment reflects the degree to which an individual is concerned about photo quality and how they are portrayed in a photo, as well as the individual effort one expends in choosing photos before sharing on social media. Photo manipulation reflects the degree which one alters their appearance in a photo.¹¹¹ In a cross-sectional sample of over 4200 adolescents, scoring high on photo investment was associated with higher risk for all eating disorders measured via the EDE-Q.¹¹² Other studies suggest that it may be due to internal processes occurring when utilizing the platform. For example, in a survey of college age women, those with greater levels of Facebook

intensity (a variable created that included amount of time spent on Facebook, number of Facebook friends, and integration of Facebook into one's non-virtual life) were actually less likely to engage in disordered eating behaviors in the absence of comparisons about physical appearance.¹¹³ Research has also identified an association between feedback seeking (i.e., seeking likes on a post or comments) and disordered eating behaviors. Individuals who reported seeking feedback on negative Facebook statuses (measured via the following item from the Maladaptive Facebook Use Questionnaire:¹¹⁴ "I sometimes write negative things about myself in my status updates to see if others respond with negative comments about me") reported higher levels of eating restraint after receiving that feedback.¹¹⁵

The relationship between social media use and disordered eating risk may be related to the ubiquitous presence of thin ideal content, long linked to disordered risk and body dissatisfaction in other forms of media. Thin ideal content on social media appears to be no exception. In an experimental design involving females between 18-29 years of age, those who were randomized to a control condition of images containing nature scenery experienced greater decreases in body dissatisfaction and greater increases in mood than their counterparts who were exposed to thin ideal imagery.¹¹⁶ One type of thin ideal content commonly found on social media sites is "thinspiration" (images or posts meant to promote thinness or inspire weight loss). A content analysis of "thinspiration" on social media sites revealed that images often contained scantily clad women with unrealistically thin body types.¹¹⁷ "Thinspiration" posts can also take the form of "fitspiration" (images or posts meant to promote physical fitness or a "healthy lifestyle"). It was revealed in a content analysis of "fitspiration" images, that this content often only reflects a thin and toned body type, and so is very similar in content to "thinspiration."¹¹⁸ "Fitspiration" does not appear to be beneficial with respect to body dissatisfaction or disordered

eating risk. In an experimental study of undergraduate females, exposure to “fitspiration” imagery resulted in increased negative mood and body dissatisfaction.¹¹⁹

Body positivity movement on social media

Social media content that promotes body positivity has been proposed as an antidote to thin-ideal social media, and research examining the protective effect of content related to body positivity has been promising. In a study of young adult men and women utilizing Ecological Momentary Assessment, exposure to body positivity on social media was associated with increased body satisfaction as well as increased positive affect.⁶⁴ In an experimental study design with young females between 18-30 years old, those exposed to body positive content had increases in positive affect and a reduction in body dissatisfaction and thin ideal internalization compared to females exposed to more traditional thin ideal images.⁶⁵ While there have been multiple studies that have shown benefits of body positive content for risk factors such as body dissatisfaction, body positive content is heterogenous and little is known about how exposure specific types of body positive content relate to risk.

Research examining the impact of The Body Positivity Movement on social media must also consider potential harms or drawbacks of the movement, which have been raised by activists in online blogs and other self-published spaces. Specifically, a major concern about the contemporary Body Positivity Movement is that it has separated itself from its anti-oppression roots, and that in doing so it is no longer inclusive of the bodies that it was designed to protect. In her piece on Body Neutrality, Alinaswe Lusengo states the following:

“The body positivity movement finds its origins in the late 1960’s amongst the massive counter-culture movements at the time. Back then, the movement was inherently political and understood that loving bodies that are devalued and discriminated against by state

was a revolutionary act. These bodies included trans bodies, disabled bodies, fat bodies, and Black bodies, to name a few. However, the Body Positivity movement today seems suspiciously divorced from politics, embraced by capitalism and its face not as diverse.”¹²⁰

Furthermore, the contemporary Body Positivity Movement’s fixation on the body and its expectation of love and aesthetic appreciation of one’s body may not be possible for many individuals. Lusengo posits that the alternative concept of body neutrality may be of more benefit, as it helps us to move away from body hatred into a space of acceptance, without the pressure of achieving a state of self-love for one’s physical body.¹²⁰

There is also the concern of lack of body diversity within the Body Positivity Movement. A content analysis of body positivity posts on Instagram revealed that posts did contain a range of body types related to body size, race/ethnicity, gender, physical disability, etc. However, there were a few notable findings when considering diversity of the movement. Posts included in the analysis were predominately of female identity (over 95%), with no identification of non-binary individuals. While there were a substantial number of images that were of Black females, no data was provided on the percentage of images that included females of a Hispanic or Latinx background. Two-thirds of the images were of females in their twenties, indicating a lack of diversity regarding age.⁶⁶

While there are concerns about the lack of body diversity within the Body Positivity Movement, there is also online body positive content that does not include images of bodies but includes text (i.e., inspirational quotes) or a combination of images and text to express ideas and messages relevant to body acceptance and other constructs. In Cohen’s content analysis of online body positivity, almost three-quarters of the images were of visual images only (with over

ninety percent of these images containing human bodies), while approximately ten percent contained visual images with accompanying text and five percent contained only text.⁶⁶

Theory and research gaps

While current evidence suggests that body positivity may be beneficial in terms of eating disorder risk (i.e., improvements in body dissatisfaction and body appreciation), its impact on a wider array of risk and protective factors is understudied. Furthermore, to this author's knowledge, there is no study that examines the link between the Body Positivity Movement and anti-fat attitudes. To fill these gaps, this dissertation study sought to further examine how exposure to body positive content on Instagram was associated with body dissatisfaction, a well-established risk factor for the development of disordered eating, as well as body functionality appreciation, a protective factor against the development of disordered eating, and anti-fat attitudes using an experimental design. Stimulus images in this study were developed to reflect a more diverse population of race/ethnicity and body size to better capture the original intent and origin of the movement. Specifically, we exposed study participants randomly to one of three conditions (a neutral control condition, a condition containing *words only* body positive content, and a condition containing images of *bodies + words*) in a single virtual study visit lasting 20 minutes to examine how type of body positive content is associated with risk and protective factors for disordered eating and anti-fat attitudes. The decision to compare *words only* body positive content versus content containing *bodies + words* is rooted in social comparison theory.⁷³ It is likely that exposure to images containing bodies could evoke upward or downward social comparisons that could have differential effects on outcomes when compared to images of *words only*.

Study objectives and hypotheses

Aim 2: Determine if exposure to body positivity content with or without the presence of bodies via social networking sites compared to neutral control images is associated with risk and protective factors for disordered eating, such as state body satisfaction (i.e., state weight satisfaction, state shape satisfaction, state appearance satisfaction), body functionality appreciation, and anti-fat attitudes.

H1: Relative to *control* images, exposure to *words only* body positivity content will be associated with increases in state body satisfaction measures and body functionality appreciation and decreases in anti-fat attitudes measured pre-post exposure for disordered eating.

H2: Relative to *control* images, exposure to images of *general bodies* + *words* body positivity content will be associated with increases in state body satisfaction and body functionality appreciation and decreases in anti-fat attitudes measured pre-post exposure for disordered eating.

H3: Relative to images of *general bodies* + *words*, exposure to *words only* body positivity content will be associated with increases in state body satisfaction and body functionality appreciation and decreases in anti-fat attitudes measured pre-post exposure for disordered eating.

Method

Systematic Search of Instagram

An undergraduate research assistant completed a systematic search of publicly available posts on Instagram for stimulus images that promoted body positive messages containing either quotations or images of female presenting bodies of a variety of racial backgrounds to be more reflective of the United States population. To reduce bias related to food or exercise, images containing this content were not included. Common hashtags were determined a priori (#bopo, #bodypositive, and #bodypositivity). For each of these hashtags, the first 600 images to show up on the search were evaluated for possible inclusion, and descriptive data was collected on all

images that met the inclusion and exclusion criteria. The inclusion criteria were as follows: female bodies, quotes about body positivity. The exclusion criteria were as follows: food images, images explicitly promoting a product/clothing line/gym chain/etc., nudity, male identifying bodies, no obvious body positive content, post containing multiple bodies, or unable to determine female presenting gender. Screenshots were taken of all images that met the above criteria. These screenshots captured the image, caption, and hashtags, but did not capture the public comments. All images were saved in a folder on GooglePhotos.

Images were then sorted into one of three categories based on descriptive data collected for each image. These categories were as follows: “Body Positive Images – No Bodies,” “Body Positive Images – Fat Bodies,” and “Body Positive Images – Non-fat Bodies.” Images were separated based on body size as the effect of body size will be examined in Aim 3. Descriptive data included: a unique ID developed for each image, the race/ethnicity of the person in the image, as well as a Stunkard Scale rating for each image to determine body size.¹²¹ Photos were then further narrowed for inclusion based on the following criteria: body images should be well defined (i.e., no baggy clothing masking shape), no image should be overtly sexual or explicit, $\frac{3}{4}$ of arms, upper torso, stomach, or legs should be visible, and body should be in position that allows for comparison to the Stunkard Scale. Stunkard Scale allowed for body size ratings ranging from 1-9 (with corresponding BMI estimates¹²²). Images were coded as “No bodies” if there was no presence of a human body. Images were coded as “Fat bodies” if they received a Stunkard rating of “6” or above. Images were coded as “Non-fat bodies” if they received a Stunkard rating of between “3” and “5.” Images that received a Stunkard rating of “2” or below were not included as these were deemed to be bodies that were more in line with societal standards related to the thin ideal. If any image of a body was determined to be larger than the

largest body on the Stunkard Scale, then that image received a “9.” Race/ethnicity of the image was determined as follows: “White,” “Black or African – American,” “Hispanic/Latinx,” “Asian/Pacific Islander,” “Native/Indigenous,” or “Mixed race.” Ratings of race/ethnicity were a subjective rating completed by the research assistant completing the systematic search. A second research assistant of a different race/ethnicity also conducted an independent subjective rating of both race/ethnicity and body size (see section below).

Stimulus Image Selection and Development

The remaining images were then evaluated for inclusion in the experimental conditions for both experimental aims of this dissertation. Therefore, this process was completed at one time point for both Aim 2 and Aim 3, as one of the conditions (*general bodies + words*) was utilized in both Aim 2 and 3. While this process is described in detail in its entirety, the conditions to be included in this chapter are defined under the subheading ***Experimental Conditions***.

A Master’s level research assistant conducted an independent rating of the race/ethnicity and body size of all remaining images. Only images that had body sizes that were categorized the same by both research assistants were marked for possible inclusion. To identify any images that did not meet face validity for the respective condition, images were presented to a media laboratory of undergraduate and graduate students who worked under a committee member/co-author. The primary investigator made all final decisions on image inclusion. Images were also selected to be nationally representative of the racial breakdown of women living in the United States of America. The final image breakdown was as follows: ten body positive images only containing words, ten body positive images only containing bodies categorized as fat, and ten body positive images only containing mid-size bodies (based on the Stunkard ratings). A sample of female undergraduate students (n=27) also independently rated each image on the Stunkard

scale to ensure that their ratings of body size corresponded with the research team. Data can be found in Table 3.1.

Images were uploaded to a private Instagram account (iguser0604) created for the purpose of this study, for further editing and development. This was done so that every image would include a neutral and consistent Instagram handle without likes or comments from the public and so the accompanying caption could be drafted by the research team.

Development of Captions

To evaluate the effect of the presence of bodies within Instagram images on risk and protective factors, Instagram captions were identical between experimental conditions. For the *control* condition, the caption used was identical to the inspirational quote in the image. For experimental condition one (*“words only”*), the caption used was identical to the body positivity quote in the image. For experimental condition three (*“general bodies + words”*) each caption from experimental condition one (*“words only”*) was paired with an image, so that there was no difference in text between the two experimental conditions.

Experimental Conditions

Ten images were chosen for each of the three conditions included in this aim (*“control,” “words only” and “general bodies + words”*). To avoid order effects, images within condition were randomized twice, so there was a total of six separate stimulus presentations. A Microsoft PowerPoint presentation was developed for each of these six presentations. Participants were randomly assigned to view one of these six presentations. All the stimulus images and their corresponding captions can be found in Appendix B. Each presentation consisted of ten images that were presented for 30 seconds each. The three conditions were created as follows:

- 1) Control Condition (“*control*”): Images containing inspirational text with no mention of bodies or body positivity
- 2) Experimental condition (“*words only*”): Images containing text related to body positivity but no presence of bodies
- 3) Experimental condition (“*general bodies + words*”): Images containing both fat and mid-size bodies with corresponding body positive text

Recruitment

Two rounds of targeted emails were sent out to 2500 students each via the Registrar’s office at the University of Michigan, for a total of 5000 students. Individuals were eligible to participate if they met the following inclusion criteria: 1) self-identify as female, 2) between 18-25 years of age, 3) currently enrolled as a student at the University of Michigan, 4) can read English fluently, and 5) no clinically significant eating disorder symptoms (Eating Disorder Examination-QS score < 2). A copy of the recruitment email can be found in Appendix C.

If participants met all criteria for inclusion, they were sent a follow-up email with a unique link to participate in the study (see Appendix C). All participants were randomized to one condition, which was overseen by a research assistant who was not involved with data analysis to ensure blinding of the primary researcher to condition.

Study Visit

Study visits took place online via Qualtrics. Before beginning the survey, all participants were asked to agree to an electronic informed consent. Upon beginning the survey, participants answered questions on demographics and completed a battery of measures which will be further discussed in the section below on survey measures. Participants then completed their randomly assigned condition where they viewed a series of ten Instagram images with accompanying

captions. The Instagram images were recorded in a YouTube video that did not allow participants to skip or fast forward to ensure completion of the study visit. Advertisements were cut from the pre- and post-video screen to eliminate any possible variability between conditions outside of the experimental manipulation. To further ensure study completion, all videos were timestamped and checked by the main researcher. Participants were then directed to the post-survey, which will also be described in detail in the section below.

Measures

Demographics. Questions were asked assessing age, race/ethnicity, parental education, and weight perception. For the variable of race/ethnicity, participants who selected one racial/ethnic category were coded as the racial/ethnic category they selected (i.e., participants who only selected “Black or African American” were coded as such). Participants were coded as “Hispanic” if they only selected “Hispanic” or if they selected “Hispanic” along with any other racial selection. For all other combinations of multiple racial/ethnic categories, participants were coded as “mixed race.” Participants with incomplete data on any of the demographic variables were not included in the analyses.

State Body Satisfaction. Upon completion of initial demographic questions, participants were presented with the following prompt: “The following are a list of questions assessing different areas of life satisfaction. Please rate how you feel RIGHT NOW by moving a vertical marker to the appropriate point on each horizontal line.” Participants completed seven VAS measures to aid in disguising the exact research question. The seven VAS measure are as follows: “Satisfied with my body shape,” “Satisfied with my romantic relationships,” “Satisfied with my overall appearance,” “Satisfied with my financial status,” “Satisfied with my weight,” “Satisfied with my social life,” and “Satisfied with my housing situation.” The three outcomes of

interest were those related to appearance and weight (i.e., “state shape satisfaction,” “state appearance satisfaction,” and “state weight satisfaction”). These measures were modeled after existing research on body positivity to make relevant comparisons to existing research.⁶⁵ These seven VAS measures were immediately presented upon completion of the exposure condition.

Body Functionality Appreciation. Functionality Appreciation Scale (FAS):¹⁰¹ Body functionality appreciation is the construct of appreciation of the various functions that the body performs and is considered an aspect of positive body image. The FAS displayed adequate construct, criterion related and incremental validity.¹⁰¹

Anti-fat attitudes. Anti-fat attitudes were measured via the Fatphobia Scale – Short Form (Fatphobia-SF). Fatphobia can be defined as negative attitudes about fat people or a pathological fear of fatness.¹⁰³ The Fatphobia-SF is a 14-item scale that has demonstrated excellent reliability and is correlated with the original Fatphobia Scale.¹⁰⁴

Statistical Analyses

Descriptive Statistics. Descriptive statistics were run on demographic characteristics including age, race/ethnicity, parental education, and weight perception. Appropriate bivariate statistics (i.e., independent t-tests, chi-squared, Fisher’s exact test, and ANOVAs) were used to examine any statistical differences between the three conditions on any of the descriptive statistics mentioned above.

Main analysis. To examine the effect of condition on outcomes, individual repeated measures ANOVAs were run with condition as the independent variable and individual outcomes as the dependent variables. These models were also run utilizing the same independent and dependent variable while also including race/ethnicity. The individual outcomes were as follows: mean change in state shape satisfaction, mean change in state appearance satisfaction,

mean change in state weight satisfaction, mean change in body functionality appreciation, and mean change in anti-fat attitudes.

Results

Description of the study population.

Participant characteristics can be found in Table 3.2. Participants were mainly non-Hispanic white (58.2%), followed by 23.9% percent Asian or Pacific Islander, 9.0% a race other than the included race/ethnicities, 6.7% Hispanic or Latinx, 1.5% Black (non-Hispanic), and 0.7% Arab American or Middle Eastern. Regarding parental education, 53.0% had a parent with a Master's degree or higher. In addition, 74.6% of the sample identified as heterosexual. There were no significant differences between condition on race/ethnicity, parental education, or sexual orientation. Of the total sample, 73.9% identified as perceiving their weight as normal. There was a significant difference of weight perception between conditions, with there being a significantly higher percentage of participants perceiving themselves as underweight (22.%) in the *control* condition compared to the *words only* condition (13.6%) and the *general bodies + words* condition (2.2%), $p=0.024$.

State Measures of Appearance, Weight, and Shape Satisfaction

The means and standard deviations for each of the three state outcome measures at both Time 1 (pre-stimulus exposure) and Time 2 (immediately post-stimulus exposure) can be found in Table 3.3 Individual repeated measures ANOVAs were run to determine whether changes in state appearance satisfaction, state weight satisfaction, and state shape satisfaction were different for those exposed to different types of Instagram posts. The main effect of time was significant for all outcomes, with increases in state shape satisfaction, state appearance satisfaction, and state weight satisfaction occurring for all conditions ($p<0.001$). The interactions between time

and condition were not significant for state shape satisfaction ($F(2, 131)=1.04$, $p=0.356$, partial $\eta^2=0.016$), state appearance satisfaction ($F(2, 131) = 1.02$, $p= 0.364$, partial $\eta^2=0.015$), or state weight satisfaction ($F(2, 131) = 2.67$, $p=0.073$, partial $\eta^2=0.039$). A visual representation of changes from Time 1 to Time 2 for all three conditions on measures of state appearance satisfaction, state weight satisfaction, and state shape satisfaction can be found in Figure 3.1.

Changes in body functionality appreciation and anti-fat attitudes

The means and standard deviations for changes in body functionality appreciation and anti-fat attitudes can be found in Table 3.4. Individual repeated measures ANOVAs were run to determine whether changes in body functionality appreciation and anti-fat attitudes were different for those exposed to different types of Instagram posts. The main effect of time was significant for all outcomes with increases in body functionality appreciation ($p<0.01$) and decreases in anti-fat attitudes ($p<0.001$) seen from Time 1 to Time 2. The interactions between time and condition for body functionality appreciation ($F(2, 131)=0.159$, $p=0.853$, partial $\eta^2=0.002$) and anti-fat attitudes ($F(2, 122) =2.68$, $p=0.073$, partial $\eta^2=0.042$) were not significant. A visual representation of changes from Time 1 to Time 2 for all three conditions on body functionality appreciation and anti-fat attitudes can be found in Figure 3.2.

Race/ethnicity and changes in outcomes

There was a significant interaction effect of race on mean change in fatphobia with less of a decrease in fatphobia for white non-Hispanics compared to other racial/ethnic groups, $p = 0.017$. All other interactions did not reach statistical significance.

Discussion

This experimental study examined changes in state body shape, appearance, and weight satisfaction, as well as changes in body functionality appreciation and fatphobia for women who

were randomly assigned to view *words only* body positive content, *general bodies + words* body positive content, or a set of *control* images. The sample was primary white non-Hispanic, heterosexual, of perceived “normal” weight status, and from a highly educated background. While we found no significant differences between any of the three conditions (i.e., our hypotheses were not supported), we found an unexpected increase in state weight, shape, and appearance satisfaction, as well as increases in body functionality appreciation and decreases in anti-fat attitudes for all conditions, including the control condition from pre-stimulus exposure to immediately post-stimulus exposure.

The findings from the present study should be interpreted in the context of other studies which examine the impact of viewing body positive content. In an experimental study design by Cohen et al., an increase in body satisfaction was seen among those exposed to body positive content compared to those who were exposed to thin-ideal content or appearance neutral content.⁶⁵ The present study differed from the Cohen et al. study in that it did not include a condition with thin ideal content, which is known to be associated with body dissatisfaction.¹²³ The present study also did not find a statistical difference between body positive conditions and a control condition (inspirational content not related to bodies) on changes in body satisfaction from pre to post exposure, which was also found in the study by Cohen et al. These differences may be due to the difference in choice of control condition. In the Cohen study, authors utilized a control condition of appearance neutral images that included nature or travel. The messaging of the control condition in the present study was designed to be inspirational, but to never mention body image or similar concepts. It could be that the use of this particular control condition (inspirational content not related to bodies) may have diminished our ability to detect a statistical difference between conditions because it was unexpectedly associated with improvement in the

outcomes examined. While this was unexpected, it is a finding worth further exploration as the use of motivational content without a focus on bodies to improve risk factors for disordered eating could possibly circumvent problematic issues brought up regarding body positivity or avoid unintended negative effects from the exposure to images of bodies. There is research to suggest that the use of motivational quotes in technological setting could have important implications for improvements in self-esteem.¹²⁴ In addition to understanding if inspirational content without the focus on bodies could have beneficial effects on outcomes when compared to body positive content, future studies examining body positivity should also utilize a truly neutral control condition as well as a thin ideal condition, which is known to be harmful. This can help further parse out and determine which type of content is helpful and how to best craft public health messages in the social media space to reduce both risk of disordered eating as well as anti-fat attitudes.

In another experimental study design, researchers found that those exposed to body positive content with average size models had greater positive mood than those exposed to a control condition containing travel photos. This study also did not find any effect on body satisfaction.¹²⁵ The present study utilized images of female-presenting individuals who were categorized as being of varying body sizes, ranging from “normal weight status” to being of significantly higher body weight. The impact of the body size of the model on outcomes in question will be examined in **Chapter 4**.

There are other understudied factors related to the content of the captions or quotations that may also play a role in the association between body positive content and risk and protective factors. One example may be the phrasing of the captions or quotations. In an experimental design, researchers examined changes in self-esteem after viewing body positive content with a

more controlling message (i.e. “You MUST be body positive to be happy”) versus body positive content that was more supportive of an individual’s autonomy. In this study, self-esteem increased after being exposed to body positive content with a supportive message and stayed the same for those who viewed body positive content that had a more controlling message.¹²⁶ Other studies also point to the role of captions on body positivity posts and changes in risk factors. In a study examining how fitspiration imagery affected body esteem and mood, researchers found that when fitspiration imagery was combined with a body positive caption, there was no decrease in negative affect, and it was associated with higher body esteem.¹²⁷ In the present study, the captions for the body positive conditions were all sourced from body positivity content on Instagram, were further crafted to be in line with the definitions of body positivity that were examined previously in **Chapter 2**, and were identical captions between experimental conditions.

This study design has multiple strengths. First, the Instagram images and captions that were included in each condition were sourced from publicly available Instagram posts which means that the content was representative of contemporary body positivity content on Instagram. Participants were randomly assigned to condition, and the authors were blinded to the randomization process. This study also utilized a pre-/post-design which reduced the possibility that differences in outcomes were due to differences between groups at baseline, which is still possible even with randomization. However, it is also worth noting that studies utilizing a pre-/post-design can be problematic as pre-test scores could influence post-test scores, especially when considering social desirability bias and third-person effect.^{128,129} That is, it may be that the women partaking in the study wanted to avoid being seen as being easily affected by media exposure. Furthermore, this study not only examined changes in risk factors for disordered eating

such as body dissatisfaction, but it also examined changes in fatphobia, which is an area that has not historically been included in the literature examining effects of exposure to body positive content. While there were multiple strengths to this study design, it was not without limitations. There were limited participants who identified as Black or African American, Hispanic, or Middle Eastern or Arab American due to the demographics of the specific university where participants were recruited. However, while many studies that rely on convenience samples have an extremely high proportion of students who identify as non-Hispanic White, our study also included a substantial proportion of students who identified as Asian American or Pacific Islander. Future research should intentionally recruit individuals who identify as Black or African American as to better understand the experiences of the most marginalized, especially given the historic roots of the movement. This study also limited its scope to those who identified as female. The research on male-identifying individuals and body positivity is sparse, and this study did not contribute to that literature. However, experimental designs relevant to body image often limit their inclusion criteria to those of female sex. This study was unique in that it included all individuals who identified as female gender, regardless of sex assigned at birth.

While significant results were not found between the experimental conditions, the findings still have multiple public health implications. To begin with, all three conditions, including the inspirational messages used in the control condition, had significant differences in body satisfaction measures from pre- to post-condition exposure. While this was in opposition to the hypothesis that body positive content would have uniquely beneficial effects on body satisfaction, these findings could help public health professionals and others who are involved in the development of social media content promote content that has the most utilitarian benefit.

This study provides useful data on how the type of body positive content is associated with risk factors and protective factors for disordered eating and anti-fat attitudes. This has important implications for the utilization of the body positivity movement within public health, which will be explored in more detail in **Chapter 5**. However, there is still much work that needs to be done to fully understand the impact of the movement. More work should be done to understand how the individual characteristics of the user, such as gender identity, race/ethnicity, and weight status are associated with outcomes. Furthermore, since social media content is generated by users, this leaves the door open to infinite types of social media content that can be linked to body positivity with the use of hashtags. Research must also consider the complex nature of algorithms unique to individual social networking sites. Future research should examine body positivity content in a naturalistic setting to better understand how/why content may differ between users, and whether this content is differentially associated with eating disorder risk.

Table 3.1 Stunkard Scale ratings by independent age and gender matched sample (n=27)

Image #	Independent Sample M (SD)
1	4.96 (0.85)
2	4.96 (0.76)
3	8.92 (0.27)
4	6.85 (0.60)
5	7.88 (0.64)
6	7.35 (0.92)
7	8.00 (0.68)
8	4.81 (0.73)
9	7.31 (0.87)
10	6.92 (0.74)
11	3.76 (0.91)
12	6.44 (0.75)
13	3.84 (0.97)
14	3.68 (0.61)
15	3.84 (0.73)
16	4.19 (0.62)
17	4.42 (1.01)
18	4.81 (0.83)
19	7.12 (0.82)
20	7.36 (0.79)

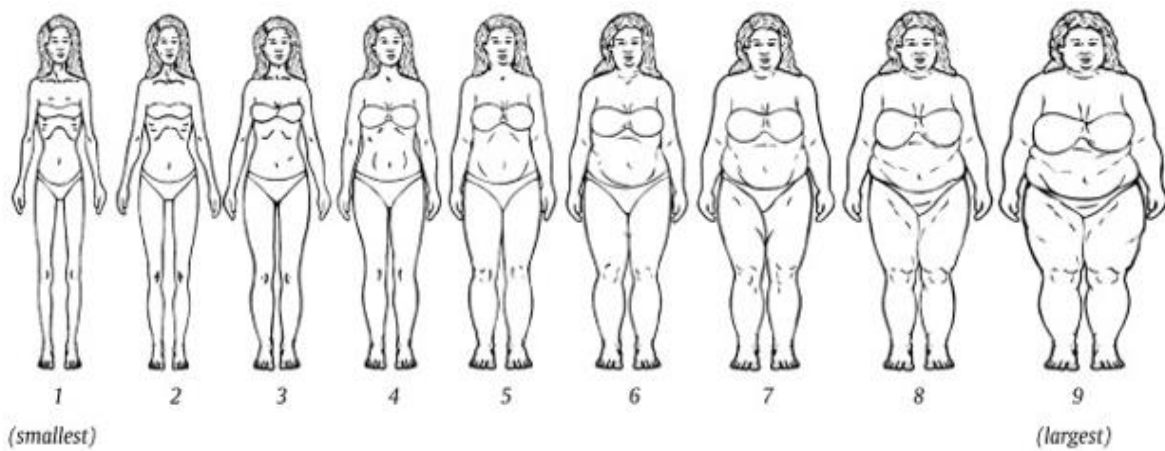


Table 3.2 Baseline characteristics of full study population and by condition

% (n)	Overall (n=134)	Control (n=45)	Words only (n=44)	General bodies + words (n=45)
Race/ethnicity				
Non-Hispanic white	58.2% (78)	51.1% (23)	61.4% (27)	62.2% (28)
Hispanic / Latinx	6.7% (9)	8.9% (4)	2.3% (1)	8.9% (4)
Black (non-Hispanic)	1.5% (2)	2.2% (1)	2.3% (1)	0.0% (0)
Asian / Pacific Islander	23.9% (32)	31.1% (14)	22.7% (10)	17.8% (8)
Arab American / Middle Eastern	0.7% (1)	0.0% (0)	2.3% (1)	0.0% (0)
Mixed race or other	9.0% (12)	6.7% (3)	9.1% (4)	11.1% (5)
Parent Education				
Less than HS	0.7% (1)	0.0% (0)	0.0% (0)	2.2% (1)
HS or GED	2.2% (3)	2.2% (1)	2.3% (1)	2.2% (1)
Some college	14.9% (20)	13.3% (6)	13.6% (6)	17.8% (8)
Associate's	3.7% (5)	6.7% (3)	4.5% (2)	0.0% (0)
Bachelor's	25.4% (34)	35.6% (16)	15.9% (7)	24.4% (11)
Master's or advanced degree	53.0% (71)	42.2% (19)	63.6% (28)	53.3% (24)
Sexual Orientation				
Heterosexual	74.6% (100)	71.1% (32)	81.8% (36)	71.1% (32)
Mostly Heterosexual	7.5% (10)	11.1% (5)	9.1% (4)	2.2% (1)
Bisexual	11.9% (16)	13.3% (6)	4.5% (2)	17.8% (8)
Mostly Homosexual	0.7% (1)	2.2% (1)	0.0% (0)	0.0% (0)
Homosexual	0.7% (1)	0.0% (0)	0.0% (0)	2.2% (1)
Other:	3.0% (4)	0.0% (0)	2.3% (1)	6.7% (3)
Missing	1.5% (2)	2.2% (1)	2.3% (1)	0.0% (0)
Weight Perception				
Very underweight	0.7% (1)	0.0% (0)	2.3% (1)	0.0% (0)
Underweight	12.7% (17)	22.2% (10)	13.6% (6)	2.2% (1)
Normal weight	73.9% (99)	71.1% (32)	65.9% (29)	84.4% (38)
Overweight	10.4% (140)	2.2% (1)	18.2% (8)	11.1% (5)
Very overweight or obese	2.2% (3)	4.4% (2)	0.0% (0)	2.2% (1)
Age (years)		19.8 (1.25)	20.1 (1.32)	19.8 (1.60)

Table 3.3 Changes in state body satisfaction by condition

	Pre-exposure Mean (SD)	Post-exposure Mean (SD)	Mean change (SD)
State shape satisfaction			
Control (n=45)	63.7 (20.0)	67.9 (16.8)	4.20 (17.7) ^a
Words only (n=44)	50.5 (24.9) ^b	59.1 (22.1)	8.61 (14.9) ^a
General bodies + words (n=45)	63.2 (25.6)	68.4 (24.0)	5.27 (12.0) ^a
State appearance satisfaction			
Control	68.2 (19.9)	69.7 (18.8)	1.44 (10.9) ^a
Words only	57.4 (23.2)	61.5 (20.4)	4.09 (13.2) ^a
General bodies + words	63.3 (23.3)	68.1 (23.2)	4.82 (11.2) ^a
State weight satisfaction			
Control	67.1 (21.9)	67.8 (18.5)	0.667 (12.8) ^a
Words only	50.5 (26.3) ^b	56.6 (23.9)	6.16 (12.0) ^a
General bodies + words	60.8 (31.2)	66.7 (27.9)	5.89 (13.3) ^a

^a Indicates that main effect of time was statistically significant at the $p < 0.001$ level

^b Indicates that the group was significantly different at baseline from the other two groups on the outcome visual analogue scale measure

Table 3.4 Changes in mean body functionality appreciation and mean anti-fat attitudes by condition

	Pre-exposure Mean (SD)	Post-exposure Mean (SD)	Mean change (SD)
Anti-fat attitudes			
Control (n=40)	3.50 (0.485)	3.38 (0.514)	-0.121 (0.316) ^a
Words only (n=42)	3.54 (0.509)	3.34 (0.554)	-0.194 (0.385) ^a
General bodies + words (n=43)	3.43 (0.690)	3.11 (0.635)	-0.321 (0.472) ^a
Body functionality appreciation			
Control (n=45)	4.11 (0.62)	4.21 (0.619)	0.095 (0.434) ^a
Words only (n=44)	4.31 (0.513)	4.40 (0.493)	0.088 (0.307) ^a
General bodies + words (n=45)	4.26 (0.685)	4.40 (0.690)	0.130 (0.387) ^a

^a Indicates that main effect of time was statistically significant at the $p < 0.01$ level

Figure 3.1 Visual representation of changes in state body satisfaction by condition

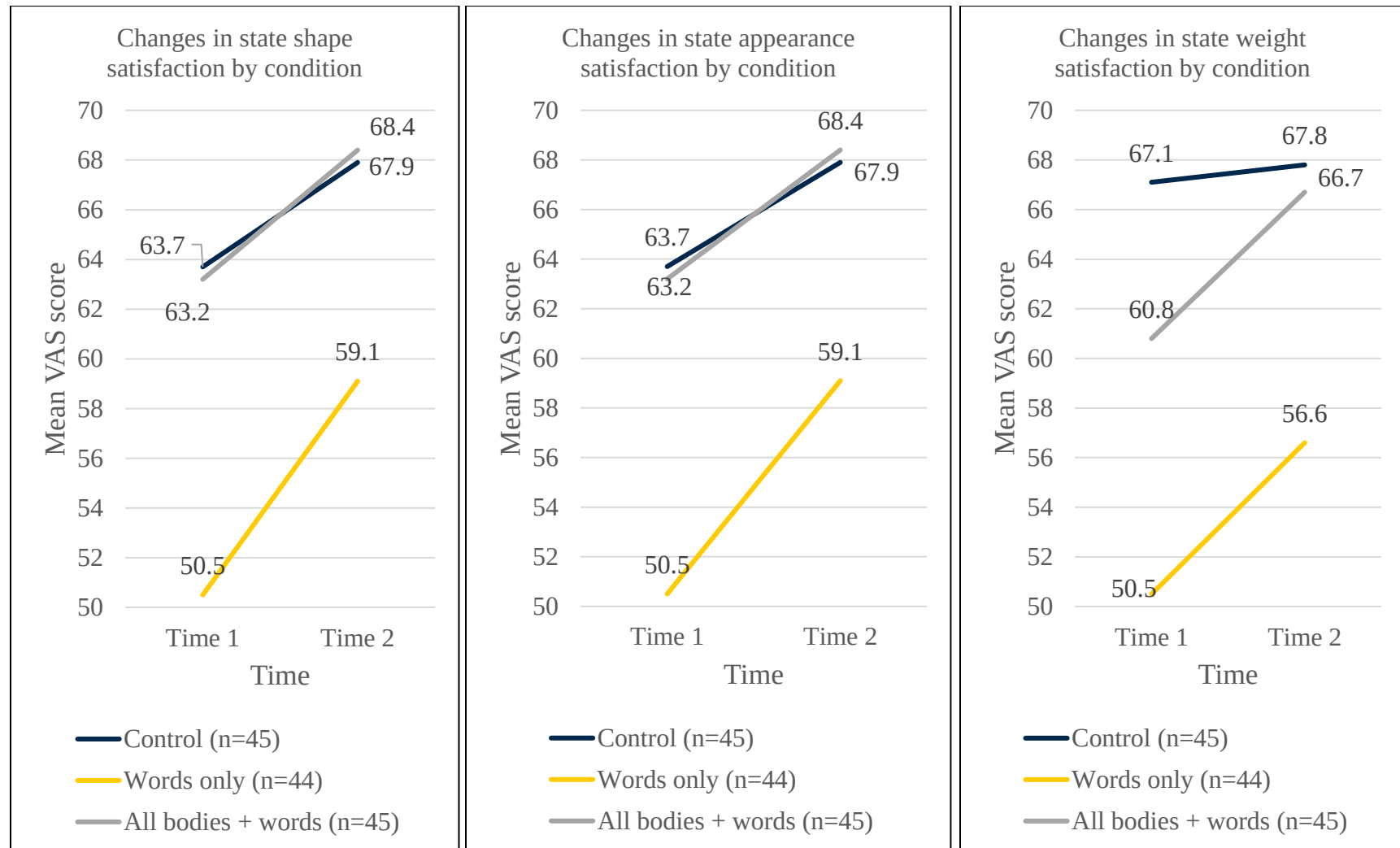
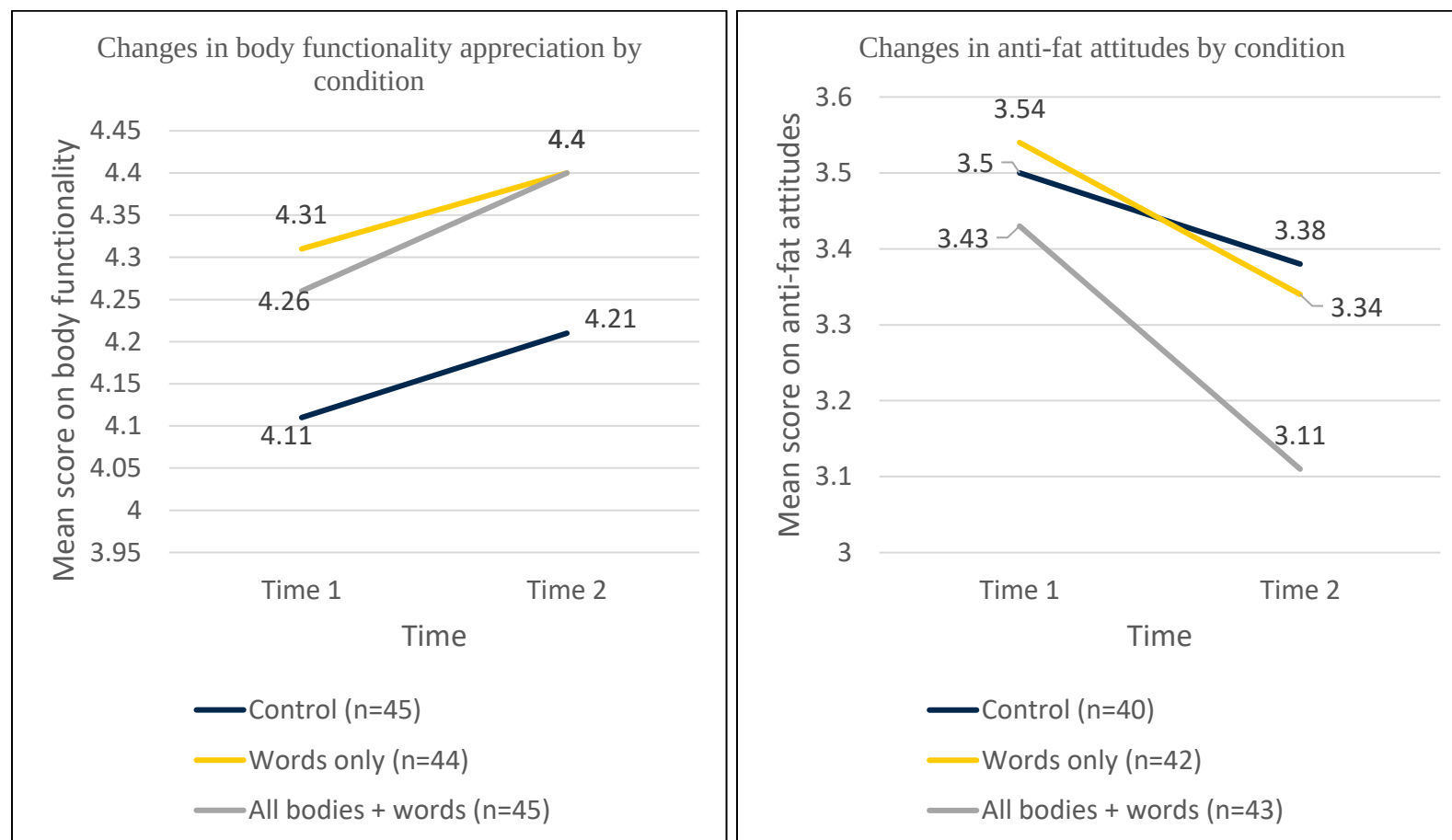


Figure 3.2 Visual representation of changes in body functionality appreciation and anti-fat attitudes by condition



Chapter 4 : The Relationship between Body Size of Body Positive Content and Risk and Protective Factors for Disordered Eating, and Anti-fat Attitudes

Fatness and the Media

Traditional screen media modalities (i.e., television, movies) portray and elevate a certain type of body as the “ideal”. Females with thin or lean body types are often portrayed as the protagonist or main character of a story, and females with below-average body weights are often overrepresented in screen media.¹³⁰ Individuals in larger bodies, if included at all, are often used as a comedic tool.^{131,132} Those in larger bodies may play the role of a side character, or even a villain, but never the main character or the love interest in a romantic comedy. This thin ideal has also dominated images in traditional print media such as magazines. The fashion industry has historically utilized models who fit a very strict set of societal beauty and body type standards, and are often of unrealistic and dangerously low body weights.¹³³ In recent years, there has been a push to be more inclusive of various body sizes across both screen and print media, especially in clothing or apparel advertisements.¹³⁴ Great size diversity in media representation is considered an important step in moving the predominant discourses on obesity from one of shame and stigma to one of greater acceptance.¹³⁵

While the societal shift towards greater inclusivity in media representation can be viewed with a hopeful lens, there is still persistent and common anti-fat messaging that predominates in the media. Anti-fat messaging in media is ubiquitous and found in print media, screen media, and online media, and includes media targeted for consumption by both adults and children.²

One example of this is the current portrayal of the “obesity epidemic” by news outlets.

Individuals in higher body weights are often shown on television clips without heads, wearing ill-fitting clothing, or eating calorie dense food, giving rise to the term “headless fatty.”¹³⁶

Effects of media images

The thin ideal presented in media has long been linked to a host of deleterious outcomes in the realm of disordered eating risk factors. For example, greater exposure to thin ideal media is associated with eating disorder symptomology, drive for thinness, and body dissatisfaction in adults.¹ Little research to date has examined the extent to which media images of other body sizes outside of the thin ideal may be associated with these risk factors, although one study found that viewing media images of bodies of a “healthy weight” may be beneficial to disordered eating risk factors. In an experimental design, young women who viewed images of models with a BMI between 18.5 to 24.9 kg/m² endorsed preference of a higher weight body ideal compared to women who viewed images of underweight models (BMI <18.5 kg/m²),¹³⁷ highlighting the influence of media images in shaping body preferences.

When expanding the scope to include images of “overweight” bodies, there is conflicting data on the role of body size in the image and body dissatisfaction. In an experimental study in adult women, there was no difference on the outcome of body dissatisfaction between those who viewed images of models categorized as overweight and those categorized as underweight or neither underweight nor overweight.¹³⁷ However, there is also research that suggests that body size of models does play a role body dissatisfaction, specifically that viewing larger models is beneficial to body satisfaction. In an experimental design, researchers assigned a group of male and female participants to view a set of images depicting bodies categorized as thin or bodies categorized as overweight. There was a significant increase in measures of body satisfaction pre-

post in those who viewed images of bodies categorized as overweight, and this effect was particularly salient for women.¹³⁸ A similarly designed study comparing exposure to images of thin models versus larger bodied models found that exposure to larger models improved body image and decreased body dissatisfaction.¹³⁹ The association between viewing larger models and increases in measures of one's own attractiveness or body image has also been found in older adolescents.¹⁴⁰ While most studies suggest that media representation of larger models may be protective in terms body satisfaction, one study found that exposure to images of “overweight models” did lead to body image dissatisfaction, but only for those with higher BMI and concurrently high neuroticism.¹⁴¹

It is also important to note that exposure to images of bodies that are larger may have important implications for anti-fat attitudes, which have been understudied to date. In one study conducted among female college students, no difference in ratings of attractiveness according to size were found when participants were exposed to images of models of various sizes. Another notable finding of this study was that there was significant reduction in anti-fat attitudes after viewing images of “overweight” models. These findings are important as data supports that viewing media images of larger bodies can have beneficial effects on body satisfaction.⁵⁵ It may be that viewing images of individuals in larger bodies can combat both body dissatisfaction and anti-fat attitudes.

Images of bodies within Body Positive Content

When looking at the existing literature on the body positivity movement, several studies have looked at the role of the image content and its association with disordered eating risk factors. The body size of the model in body positive media images is one example of content that has been manipulated in experimental designs. In an experimental design of adult women

between 18 to 29 years of age, researchers exposed participants to one of three conditions: a control condition of travel images, an experimental condition of body positive images containing “normal-size” female models, or a condition containing images of female models in larger bodies. Participants then completed measures on mood and body satisfaction. While researchers found that there was no difference in body satisfaction between conditions, they did find that women exposed to images of average bodies reported more positive mood after exposure.¹²⁵ Other studies examining the role of body size in the body positivity movement have looked at whether or not there was a difference between exposure to thin models versus average size models. In a study examining this question in adult women between 18-29 years of age, researchers found that those exposed to body positive content containing average sized models had less body dissatisfaction and greater body appreciation than those exposed to thin models.¹⁴²

Theory and research gaps

Considering how different bodies are portrayed and viewed in media spaces, one can postulate the body size represented in social media posts on body positivity may play a role in how the content of body positive messaging is perceived. There is limited data at this point to examine how variations of body size within body positive content specifically (i.e., posts that portray individuals with diverse body size as well as body positive messaging) is associated with a wider array of risk and protective factors for disordered eating. Furthermore, this question has not been examined in relation to anti-fat attitudes, which is a primary focus of this dissertation. Therefore, it is possible that those who are exposed to body positive content may experience different changes in risk factors depending on the size of the model in the image. This is likely due to upward or downward social comparisons explained by Social Comparison Theory.⁷³ Additionally, unique approaches are needed to combat the ubiquitous weight bias present in the

media.¹⁴³ It may be that counterconditioning approaches such as exposing people to fat bodies portrayed in a positive light could have implications for the reduction of weight bias.

Accordingly, the aim of the present study was to examine the role of body size in image-based body positive content for risk and protective factors for disordered eating, including body functionality appreciation and anti-fat attitudes. In an experimental design, participants were randomized to one of three experimental conditions; a body positive condition containing images of *mid-size bodies + words* (defined below), a condition containing *fat bodies + words* and a condition containing images of *general bodies + words* (defined previously in **Chapter 3**). In previous studies examining the effect of media images, the definition of “overweight bodies” or “plus-size bodies” can vary between studies. For this study, *mid-size bodies* are bodies that might be considered somewhat “overweight” or on the smaller end of the “plus-sized clothing range (i.e., would not be categorized as the thin ideal, but are not likely to experience substantial anti-fat attitudes or discrimination). The condition of *fat bodies* is meant to capture those bodies that are of such a high body weight that they may be stigmatized or marginalized. Definitions of these conditions can be found under the **Methods** section. We used this experimental design to examine the following study aim:

Aim 3: Determine if exposure to body size variations in body positivity content (1-images of *mid-size bodies + words*, 2-images of *fat bodies + words*, 3- images of *general bodies + words* via social networking sites is associated with risk factors and protective factors for disordered eating such as state body satisfaction (i.e. state weight satisfaction, state shape satisfaction, state appearance satisfaction), body functionality appreciation, and anti-fat attitudes.

Exploratory sub-aim: Examine whether race/ethnicity and weight perception may moderate the association between exposure to body positivity content via social networking sites and risk and protective factors for disordered eating and anti-fat attitudes.

H1: Exposure to *fat bodies + words* body positivity content will be associated with a reduction in anti-fat attitudes measured pre-post exposure, relative to *mid-size bodies + words*.

H2: All experimental conditions will be associated with a reduction in body dissatisfaction.

H3: All experimental conditions will be associated with an increase in body functionality appreciation.

Methods

Systematic Search of Instagram

Stimulus images for this aim were selected from the same systematic search of Instagram described in detail for Aim 2 (see ***Systematic Search of Instagram*** found under **Method** section in **Chapter 3**).

Stimulus Image Selection and Development.

The remaining images were then evaluated for inclusion in the experimental conditions for both experimental aims of this dissertation. Therefore, this process was completed at one time point for both Aim 2 and Aim 3, as one of the conditions (*general bodies + words*) was utilized in both Aim 2 and 3. While this process is described in detail in its entirety, the conditions to be included in this chapter are defined under the subheading ***Experimental Conditions***.

The remaining images were then evaluated for inclusion in the experimental conditions. A Master's level research assistant conducted an independent rating of the race/ethnicity and body size of all remaining images. Only images that had body sizes that were categorized the

same by both research assistants were marked for possible inclusion. No disagreements were noted that needed to be resolved by the primary researcher. Furthermore, images were presented to a media laboratory of undergraduate and graduate students who worked under a committee member authored on this project. This was done to identify any images that did not meet face validity for the respective condition. The primary investigator made all final decisions on image inclusion. Images were also selected to be nationally representative of the racial breakdown of females living in the United States of America. The final image breakdown was as follows: ten body positive images only containing bodies categorized as fat, and ten body positive images only containing bodies that were categorized as mid-size (based off the Stunkard ratings). A sample of female undergraduate students (n=27) also independently rated each image on the Stunkard scale to ensure that their ratings of body size corresponded with the research team. These ratings can be found in **Chapter 3**, Table 3.1.

Images were uploaded to a private Instagram account (iguser0604) created for the purpose of this study, for further editing and development. This was done so that every image would include a neutral and consistent Instagram handle without likes or comments from the public. This was also done so that the caption could be drafted by the research team.

Development of Captions

To evaluate the effect of the presence of bodies on risk factors, Instagram captions must be identical between experimental conditions. In Aim 2, ten images containing body positive quotations were developed for the *words only* condition. These same quotations were used for the experimental conditions in this aim (“*mid-size bodies + words*”, “*fat bodies + words*”, and “*general bodies + words*”) in this aim so that captions were identical. Each of the ten captions

were randomly paired with an image in each of the three experimental conditions (“*mid-size bodies + words*,” “*fat bodies + words*,” *general bodies + words*”).

Experimental Conditions

Ten images were chosen for each of the three conditions. To avoid order effects, images within condition were randomized twice, so that there was a total of six separate stimulus presentations. A Microsoft PowerPoint presentation was developed for each of these ten presentations. Participants would be randomly assigned to view one of these six PowerPoint presentations. All of the stimulus images and their corresponding captions can be found in Appendix B. The presentations consisted of ten images that were presented for 30 seconds each. The three conditions were created as follows:

- 1) “*mid-size bodies + words*”
- 2) “*fat bodies + words*”
- 3) “*general bodies + words*”

Recruitment

A targeted email was sent out to two independent groups of 2500 students via the Registrar’s office at the University of Michigan at the end of the Fall 2021 semester. A secondary round of recruitment was conducted at the beginning of the Winter 2022 semester. Individuals were eligible to participate if they met the following inclusion criteria: 1) self-identify as female, 2) between 18-25 years of age, 3) currently enrolled as a student at the University of Michigan, 4) can read English fluently, and 5) received a negative screen on the Eating Disorder Examination-QS (score < 2). A copy of the recruitment email can be found in Appendix C.

If participants met all criteria for inclusion, they were sent a follow-up email with a unique link to participate in the study. All participants were randomized to a condition, which was overseen by a research assistant who was not involved with data analysis to ensure blinding of the primary researcher to condition.

Study Visit

Before beginning the survey, all participants were asked to agree to an electronic informed consent. All data collection was done via an online Qualtrics survey which was managed by a research assistant not involved with data analysis. Upon beginning the survey, participants answered questions on demographics and completed a battery of measures which will be further discussed in the section below on survey measures. Participants then completed their randomly assigned condition where they viewed a series of ten Instagram images with accompanying caption. The Instagram images were recorded in a video that did not allow participants to skip or fast forward to ensure completion of the study visit. To further ensure study completion, all videos were timestamped and checked by the main researcher. Participants were then directed to the post-survey, which will also be described in detail in the section below.

Survey Measures

Demographics. Questions were asked assessing age, race/ethnicity, parental education, and weight perception. For the variable of race/ethnicity, participants were coded as “Hispanic” if they only select “Hispanic” or if they select “Hispanic” along with any other racial selection. For all other combinations, participants will be coded as “mixed race.” Participants with incomplete data on any of the demographic variables were not included in the analyses.

State shape, appearance, and weight satisfaction. Upon completion of initial demographic questions, participants were presented with the following prompt: “The following

are a list of questions assessing different areas of life satisfaction. Please rate how you feel RIGHT NOW by moving a vertical marker to the appropriate point on each horizontal line.” Participants completed seven VAS measures to aid in disguising the exact research question. The seven VAS measure are as follows: “Satisfied with my body shape,” “Satisfied with my romantic relationships,” “Satisfied with my overall appearance,” “Satisfied with my financial status,” “Satisfied with my weight,” “Satisfied with my social life,” and “Satisfied with my housing situation.” The three outcomes of interest were those related to appearance and weight (i.e. “body shape,” “overall appearance,” and “weight.” These measures were mirrored after existing research on body positivity to make relevant comparisons to existing research.⁶⁵ These seven VAS measures were immediately presented upon completion of the exposure condition.

Body Functionality Appreciation. Functionality Appreciation Scale (FAS): Body functionality appreciation is the construct of appreciation of the various functions that the body performs and is considered an aspect of positive body image. The FAS displayed adequate construct, criterion related and incremental validity.

Anti-fat attitudes. Anti-fat attitudes were measured via the Fatphobia Scale – Short Form (Fatphobia-SF). Fatphobia can be defined as negative attitudes about fat people or a pathological fear of fatness.¹⁰³ The Fatphobia-SF is a 14-item scale that has demonstrated excellent reliability and is correlated with the original Fatphobia Scale.¹⁰⁴

Statistical Analysis

Descriptive Statistics. Descriptive statistics were run on demographic characteristics including age, race/ethnicity, parental education, and weight perception. Appropriate bivariate statistics (i.e., independent t-tests, chi-squared, Fisher’s exact test, and ANOVAs) were used to

examine any statistical differences between the three conditions on any of the descriptive statistics mentioned above.

Main analysis. To examine the effect of condition on outcomes, individual repeated measures ANOVAs were run with condition as the independent variable and individual outcomes as the dependent variables. These models were also run utilizing the same independent and dependent variable while also including race/ethnicity. The individual outcomes were as follows: mean change in state shape satisfaction, mean change in state appearance satisfaction, mean change in state weight satisfaction, mean change in body functionality appreciation, and mean change in fatphobia.

Interaction of race/ethnicity and weight perception. To examine whether race/ethnicity and weight perception serve as moderators between exposure to body positive content and the outcomes of interest, the individual repeated measure ANOVAs were rerun including race/ethnicity and weight perception as covariates. Weight perception was included as opposed to body mass index (BMI) as weight perception has been linked to disordered eating risk regardless of actual BMI.^{144–146}

Results

Description of study population

Participant characteristics can be found in Table 4.1. Participants were mainly non-Hispanic white (56.3%), followed by 23.7% percent Asian or Pacific Islander, 8.9% a race other than the included race/ethnicities, 5.9% Hispanic or Latinx, 2.2% Black (non-Hispanic), and 3.0% Arab American or Middle Eastern. There were no significant differences between condition on race/ethnicity. In regard to parental education, 48.1% had a parent with a Master's degree or higher. There were no significant differences between condition on parental education.

Of the total sample, 66.7% identified as heterosexual, and there were no significant differences in sexual orientation between condition. Of the total sample, 78.5% perceived their weight as “normal” (vs. very underweight, underweight, overweight, or very overweight). There were no significant differences of weight perception between conditions.

State Measures of Appearance, Weight, and Shape Satisfaction

The means and standard deviations for each of the three state outcome measures can be found in Table 4.2. Individual repeated measures ANOVAs were run to determine whether changes in the state appearance, state weight, and state shape satisfaction were different for those exposed to different types of Instagram posts. The main effect of time was significant for all outcomes, with increases in state appearance, state weight, and state shape satisfaction occurring for all conditions ($p < 0.001$). There was no significant interaction between time and condition for state shape satisfaction ($F(2, 132) = 0.202, p = 0.817, \text{partial } \eta^2 = 0.003$) or state weight satisfaction ($F(2, 132) = 0.381, p = 0.684, \text{partial } \eta^2 = 0.006$). There was a significant time by condition interaction for state appearance satisfaction ($F(2, 132) = 3.61, p = 0.030, \text{partial } \eta^2 = 0.052$).

We utilized Tukey HSD post-hoc test to examine pairwise comparisons between conditions on state appearance satisfaction. As seen in Table 3.3, increases in state appearance satisfaction were greatest for *fat bodies + words*, followed by *general bodies + words*, followed by *mid-size bodies + words*. Tukey’s post hoc analysis revealed that the changes in state appearance satisfaction were significantly higher for those exposed to *fat bodies + words* compared to *general bodies + words* ($p = 0.040$), but there were no other statistically significant differences between conditions.

Changes in body functionality appreciation and anti-fat attitudes

The means and standard deviations for changes in a body functionality appreciation and anti-fat attitudes can be found in Table 4.3 Individual repeated measures ANOVAs were run to determine whether changes in body functionality appreciation and anti-fat attitudes were different for those exposed to the three conditions. The main effect of time was significant for all outcomes with increases in body functionality appreciation ($p < 0.001$) and decreases in anti-fat attitudes ($p < 0.001$). The interactions between time and condition were not significant for body functionality or anti-fat attitudes.

Effect of race/ethnicity and weight perception

There was no interaction between race/ethnicity and condition on state shape satisfaction, state appearance satisfaction, or state weight satisfaction. Overall, there was a main effect of race on mean change in anti-fat attitudes over time, with those identifying as Asian American or Pacific Islander experiencing less of a decrease in anti-fat attitudes than those with other racial/ethnic backgrounds ($p < 0.011$). There was a significant interaction between race/ethnicity and condition on mean change in body functionality appreciation ($p = 0.004$). There were no significant interactions between weight perception and condition on state shape satisfaction, state appearance satisfaction, state weight satisfaction, body functionality, or anti-fat attitudes.

Discussion

This study examined whether there was an association between exposure to body positive content that varies by body size of the image (i.e., mid-size bodies, fat bodies, general bodies) and risk and protective factors for disordered eating such as state weight, shape, and appearance satisfaction, body functionality appreciation, and fatphobia. Across all three conditions, there was a significant effect of time such that participants experienced increases in state shape satisfaction, state appearance satisfaction, and state weight satisfaction from pre- to post-

exposure. While no differences were found between conditions on state shape satisfaction or state weight satisfaction, there was a significant difference in state appearance satisfaction, with the greatest increase for those participants who viewed body positive content containing only fat bodies. Furthermore, there was also a significant effect of race/ethnicity, with those who identified as Asian American or Pacific Islander experiencing less of a decrease in anti-fat attitudes. No significant interaction was found for weight perception.

In this study, there were significant increases in state appearance satisfaction for those participants who viewed body positivity content containing *fat bodies + words*. Surprisingly, no differences in this outcome were found when accounting for weight perception, indicating that the effect on state appearance satisfaction did not differ based on weight perception. While this result provides compelling evidence to support greater inclusivity of body sizes within body positivity content, there are likely a mix of positive and negative mechanisms underpinning this finding. One such mechanism could be downward social comparisons, in which individuals compare themselves to another individual on a specific characteristic. There is a robust amount of literature supporting the role of social comparisons and their role in body dissatisfaction.⁷⁴ In this study, individuals likely compared their own body size to that of the body in the image. In the case of our participants, they could have compared their body size to the bodies of the models in the *fat bodies + words* condition. As Western society places an emphasis on thin bodies and values them as attractive, it is likely that participants may have viewed the images of fat bodies as less attractive than their own, therefore, engaging in downward social comparisons. As this sample primarily considered their weight to be “normal,” and not “overweight” or “obese,” it is likely the comparisons were downward and not upward. This comparison could have led to increases in one’s own state appearance satisfaction.

Despite the possibility of a less favorable mechanism explaining the findings on appearance satisfaction, one must also consider how exposure to diversity and inclusion can increase one's own attitudes regarding the importance of diversity and inclusion. For example, in a study that targeted individuals' perceptions of their peers' social norms, it was found that communicating to participants that their peers held beliefs on the importance of diversity and engaged in inclusive practices, increased their own positive attitudes about outgroups and they held more positive opinions on diversity. More importantly, marginalized students even reported greater levels of belonging post intervention.¹⁴⁷

This study design has multiple strengths from study design to analysis. First, the Instagram images and captions included in each condition were sourced from publicly available Instagram posts on body positivity. This makes it more likely that the content was representative of contemporary body positivity on Instagram. Participants were randomly assigned to condition by a research assistant uninvolved in study design or analysis. A pre-/post-design was implemented to reduce the possibility that differences in outcomes were due to differences between groups at baseline, which is still possible even with randomization. Furthermore, this study not only examined changes in risk factors for disordered eating such as body dissatisfaction, but it also examined changes in anti-fat attitudes, which is an area that has not historically been included in the literature examining effects of exposure to body positive content.

This study has multiple strengths but is not without limitations. First, to answer this question participants were drawn from the same convenience sample of undergraduate students that was utilized in the previous chapter. Participants were predominantly of white non-Hispanic background, with the second most common representation being students who identified as

Asian American or Pacific Islander. Therefore, it is difficult to examine how body positive content would affect those of other minoritized racial or ethnic identities. Future studies should include more targeted sampling to enable examine this question among those who identify as Black or African American, Hispanic or Latinx, or other racial ethnic backgrounds. Furthermore, the issue of participant body size or weight status may be even more relevant to this specific research question. While the sample size of participants in higher body weights was not adequate to determine if effects differed by body size of the participant, it should be examined in future studies given the disproportionate burden individuals in larger bodies face. Additionally, this study was conducted online, which is both a strength and limitation. As an online study, the study environment was closer to real world conditions in that participants were viewing stimulus images on their own electronic devices without the presence of a research assistant. However, this also could have been a limitation as it limited research team control over participant attention to the images. Researchers did attempt to control for attention by various controls through Qualtrics. Another limitation of this study was that the experimental design did not include a thin ideal condition. Due to the lack of a condition containing images and captions related to the thin ideal, there are limitations regarding the implications on harm reduction via exposure to body positivity content. Future research should include a thin ideal condition so that comparisons can be made between body positivity content and more traditional thin ideal media.

This study provides useful data on how the size of the body within body positive posts can affect risk factors and protective factors for disordered eating as well as anti-fat attitudes. While there was only one significant difference between conditions, one must consider the positive changes in all outcomes regardless of condition. These finding support promotion of more inclusive body positivity content, that will be discussed in greater detail in **Chapter 5**.

However, there is still much work that needs to be done to fully understand the impact of movement and, specifically, how the individual characteristics of the social media user, such as gender identity, race/ethnicity, and weight status, are associated with a range of outcomes.

Table 4.1 Baseline characteristics of full study population and by condition

% (n)	Overall (n=135)	Fat bodies + words (n=45)	Mid-size bodies + words (n=45)	General bodies + words (n=45)
Race/ethnicity				
Non-Hispanic white	56.3% (76)	51.1% (23)	55.6% (25)	62.2% (28)
Hispanic / Latinx	5.9% (8)	6.7% (3)	2.2% (1)	8.9% (4)
Black (non-Hispanic)	2.2% (3)	2.2% (1)	4.4% (2)	0.0% (0)
Asian / Pacific Islander	23.7% (32)	28.9% (13)	24.4% (11)	17.8% (8)
Arab American / Middle Eastern	3.0% (4)	4.4% (2)	4.4% (2)	0.0% (0)
Mixed race or other	8.9% (12)	6.7% (3)	8.9% (4)	11.1% (5)
Parent Education				
Less than HS	1.5% (2)	0.0% (0)	2.2% (1)	2.2% (1)
HS or GED	6.7% (9)	8.9% (4)	8.9% (4)	2.2% (1)
Some college	19.3% (26)	20.0% (9)	20.0% (9)	17.8% (8)
Associate's	2.2% (3)	4.4% (2)	2.2% (1)	0.0% (0)
Bachelor's	22.2% (30)	22.2% (10)	20.0% (9)	24.4% (11)
Master's or advanced degree	48.1% (65)	44.4% (20)	46.7% (21)	53.3% (24)
Sexual Orientation				
Heterosexual	66.7% (90)	64.4% (29)	64.4% (29)	71.1% (32)
Mostly Heterosexual	13.3% (18)	17.8% (8)	20.0% (9)	2.2% (1)
Bisexual	13.3% (18)	13.3% (6)	8.9% (4)	17.8% (8)
Mostly Homosexual	0.7% (1)	0.0% (0)	2.2% (1)	0.0% (0)
Homosexual	2.2% (3)	2.2% (1)	2.2% (1)	2.2% (1)
Other:	3.7% (5)	2.2% (1)	2.2% (1)	6.7% (3)
Missing	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Weight Perception				
Very underweight	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Underweight	5.9% (8)	13.3% (6)	2.2% (1)	2.2% (1)
Normal weight	78.5% (106)	66.7% (30)	84.4% (38)	84.4% (38)
Overweight	14.1% (19)	17.8% (8)	13.3% (6)	11.1% (5)
Very overweight or obese	1.5% (2)	2.2% (1)	0.0% (0)	2.2% (1)
Age (years)	19.8 (1.3)	19.7 (1.26)	19.9 (1.16)	19.8 (1.60)

Table 4.2 Changes in state body satisfaction by condition

	Pre-exposure	Post-exposure	Mean change (SD)
State shape satisfaction			
General bodies + words (n=44)	63.2 (25.6)	68.4 (24.0)	5.27 (12.0) ^a
Fat bodies + words (n=45)	57.6 (20.9)	63.2 (21.8)	5.51 (14.3) ^a
Mid-size bodies + words (n=45)	58.7 (22.0)	62.6 (24.0)	3.89 (12.8) ^a
State appearance satisfaction			
General bodies + words	63.3 (23.3)	68.1 (23.2)	4.82 (11.2) ^a
Fat bodies + words	50.1 (21.9) ^c	58.4 (23.7)	8.33 (13.0) ^{a,b}
Mid-size bodies + words	61.7 (21.3)	62.6 (24.2)	0.933 (14.7) ^a
State weight satisfaction			
General bodies + words	60.8 (31.2)	66.7 (27.9)	5.89 (13.3) ^a
Fat bodies + words	54.4 (26.0)	60.5 (25.5)	6.02 (15.5) ^a
Mid-size bodies + words	56.6 (26.9)	60.3 (26.9)	3.84 (10.5) ^a

^a Indicates that main effect of time was statistically significant at the $p < 0.001$ level

^b Indicates that there was a significant interaction between time and condition at the $p < 0.05$ level

^c Indicates that the group was significantly different at baseline

Table 4.3 Changes in body functionality appreciation and anti-fat attitudes by condition

	Pre-exposure	Post-exposure	Mean change (SD)
Anti-fat attitudes			
General bodies + words (n=43)	3.43 (0.690)	3.11 (0.635)	-0.395 (0.586) ^a
Fat bodies + words (n=43)	3.48 (0.601)	3.08 (0.581)	-0.395 (0.586) ^a
Mid-size bodies + words (n=43)	3.47 (0.620)	3.22 (0.518)	-0.249 (0.426) ^a
Body functionality appreciation			
General bodies + words (n=45)	4.26 (0.635)	4.39 (0.690)	0.130 (0.387) ^a
Fat bodies + words (n=45)	4.11 (0.565)	4.27 (0.583)	0.156 (0.396) ^a
Mid-size bodies + words (n=45)	4.27 (0.650)	4.44 (0.643)	0.168 (0.418) ^a

^a Indicates that main effect of time was statistically significant at the $p < 0.001$ level

Figure 4.1: Visual representation of changes in state body satisfaction by condition

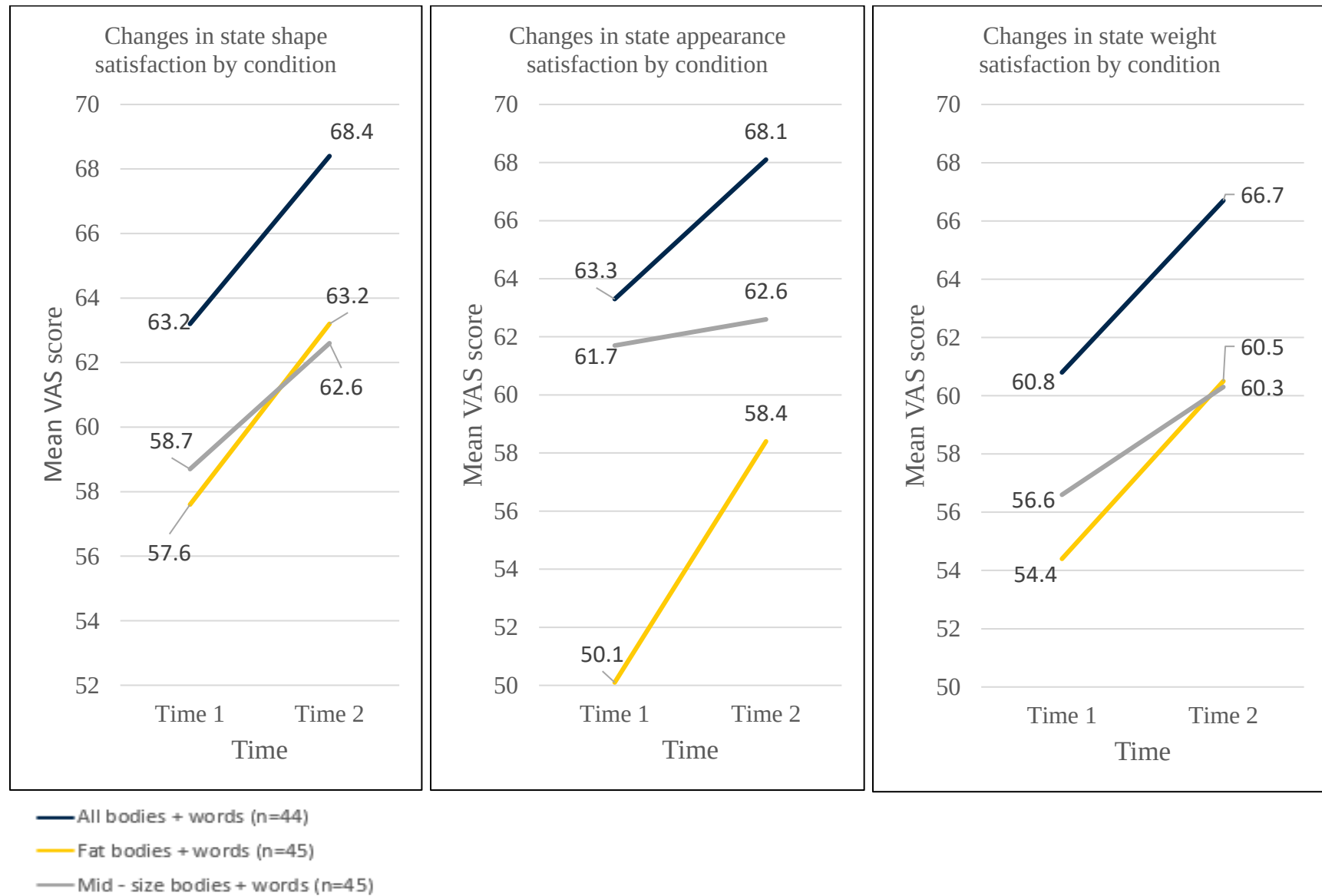
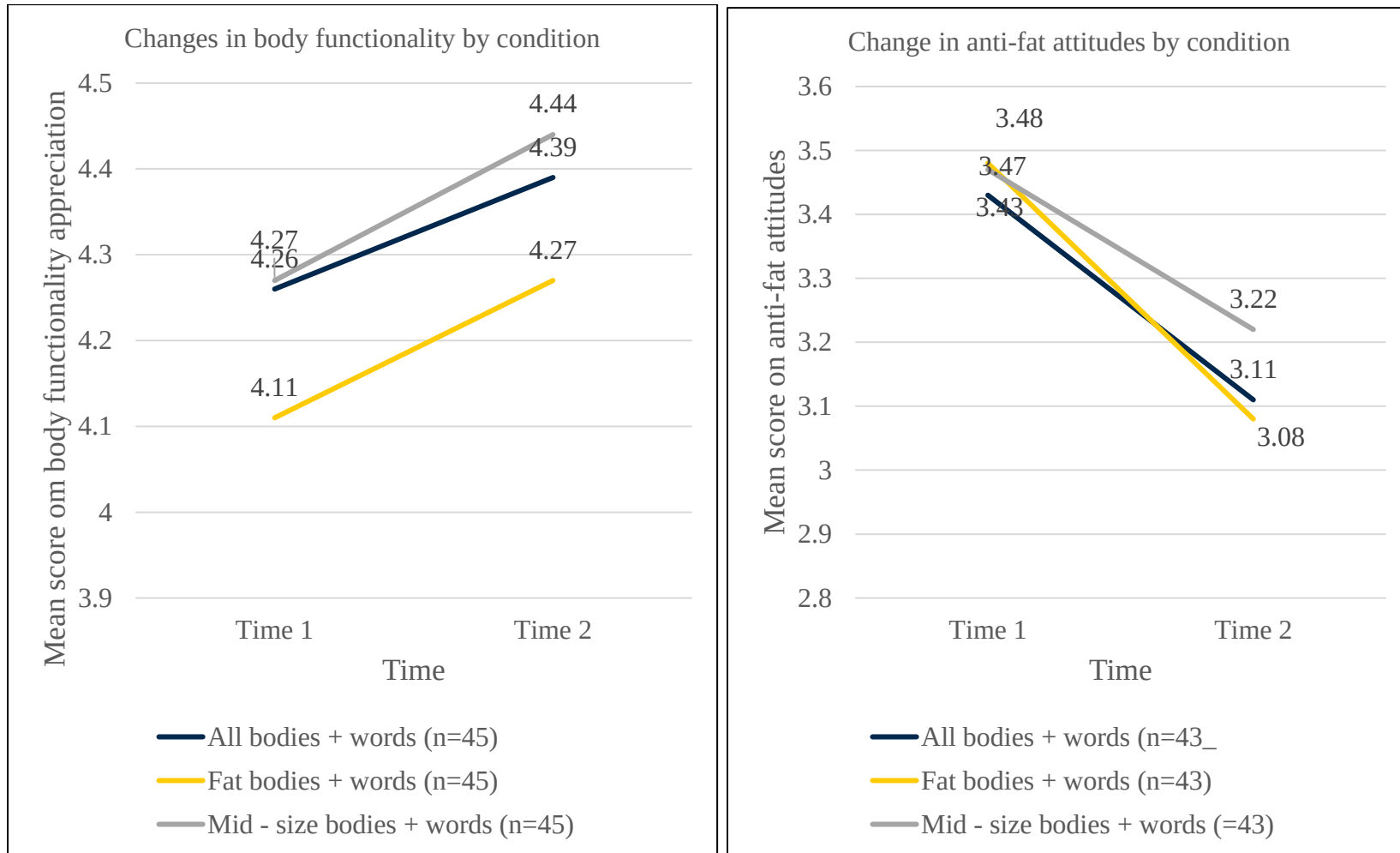


Figure 4.2 Visual representation of changes in body functionality appreciation and anti-fat attitudes by condition



Chapter 5: Conclusions

Summary of Main Findings

Aim 1

In this cross-sectional survey, data collected from 379 participants between 18-25 years of age who identified as female were used to create a user-generated definition of body positivity and to determine the relationship between agreement with body positivity and risk and protective factors for disordered eating, overall eating disorder risk, and anti-fat attitudes. Young women defined body positivity as being about “body acceptance,” “body love and confidence,” “not body shaming,” and “appreciation of body diversity.” Other definitions included “rejection of societal ideals about weight and appearance” and the “prioritization of health over appearance.” This entire definition is what the research team defined as mainstream body positivity. While there was limited variability in how young adult women defined mainstream body positivity, there was a notable finding when it came to the concept of fat liberation. After providing a user-generated definition of mainstream body positivity, this study examined whether there was a difference between individuals who had complete agreement with mainstream body positivity versus individuals who did not have complete agreement with mainstream body positivity. In covariate adjusted models, we observed a significant association between agreement with body positivity and higher body functionality appreciation and lower fatphobia. Notably and contrary to the hypothesis, agreement with body positivity was associated with higher thin ideal internalization. Individuals who agreed with fat liberation had lower scores on the EDE-QS,

higher body functionality appreciation scores, and lower scores on fatphobia than those who did not agree with fat liberation. Furthermore, among those who completely agreed with mainstream body positivity, those who also agreed with fat liberation had higher scores on body functionality appreciation than those who just had complete agreement with mainstream body positivity but not with fat liberation.

Aim 2

This experimental study examined changes in state weight satisfaction, state shape satisfaction, and state appearance satisfaction as well as changes in body functionality appreciation and anti-fat attitudes for women who were randomly assigned to view *words only* body positive content, *general bodies + words* body positive content, or a set of *control* images in a sample of female-identifying college students. Participants were primarily white, heterosexual, of perceived “normal” weight status, and from a highly educated background. While we found no significant effect of condition (i.e., our hypotheses were not supported), but we found an unexpected increase in state weight satisfaction, state shape satisfaction, and state appearance satisfaction, as well as increases in body functionality appreciation and decreases in anti-fat attitudes for all conditions, including the *control* condition, from pre- to post-exposure. Similarly, participants in all three conditions saw increases in body functionality appreciation and decreases in anti-fat attitudes from pre to post exposure.

Aim 3

This experimental study examined whether there was an association between exposure to body positive content that varies by body size of the image (i.e., *mid-size bodies + words*, *fat bodies + words*, *general bodies + words*) and risk and protective factors for disordered eating such as state weight satisfaction, state shape satisfaction, and state appearance satisfaction, body

functionality appreciation, and anti-fat attitudes. There was a significant effect of time for all three conditions, such that participants experienced increases in state shape satisfaction, state appearance satisfaction, and state weight satisfaction from pre to post exposure. While we did not see any differences between conditions on state shape or state weight satisfaction, there was a significant difference in state appearance satisfaction, with the greatest increase for those participants who viewed body positive content containing only fat bodies.

Strengths and Limitations

To the author's knowledge, this is the first study to create an empirically derived, and user-driven definition of the body positivity movement. This study was also unique in that it utilized a mixed methods approach, as well as multiple types of data collection methods to answer the primary research questions. Qualitative preliminary data informed the quantitative measures that were collected in the cross-sectional survey distributed for Aim 1. Aims 2 and 3 utilized an experimental paradigm where participants were randomly assigned to condition to which the primary researcher was blind. Furthermore, stimulus images presented in the experimental paradigm were designed by using a systematic and rigorous approach and were sourced from publicly available Instagram posts which means that the content was representative of contemporary body positivity on Instagram. Another strength of this dissertation is that not only did it examine associations between body positivity and both risk and protective factors for disordered eating, but it also examined anti-fat attitudes, which has not been included in the literature examining effects of exposure to body positive content to date.

While this dissertation has many strengths, it does present with several limitations. Survey data for Aim 1 was collected via a cross-sectional survey design, and so it is impossible to examine if a causal relationship exists between body positivity and the selected risk and

protective factors. Furthermore, participants for all three aims were a convenience sample of undergraduate students who identified as female. However, this dissertation is unique in that all participants who identified as female, either cisgender or transgender, were included. While there were a high proportion of students who identified as Asian or Pacific Islander in all three study populations, the sample was still predominantly White with a very small percentage of women who identified as African American or Black. Furthermore, most students viewed their body weight as a normal weight, and therefore we were limited in variability of body size.

Results in the context of existing body positivity literature

There is a growing body of research that demonstrates that exposure to body positive content may have beneficial effects on risk factors relevant to the development of eating disorders. Young adult females and males exposed to body positive content reported higher levels of body satisfaction,⁶⁴ however, this study used ecological momentary assessment as opposed to an experimental design. In one of the first experimental study designs, those who were randomly allocated to view body positive images had increases in body satisfaction and body appreciation compared to their peers who viewed either thin idealized content or appearance neutral content.⁶⁵ In this study, appearance neutral content was also neutral in its message (i.e., images of nature and travel). In contrast, this dissertation utilized a control condition that was body neutral (i.e., no mention of appearance, weight, shape, bodies, etc.), however, the message itself was still inspirational. It is possible that how we defined the control condition likely contributed to the inability to detect a noticeable difference between the control condition and body positive conditions.

The effect of body positivity may differ according to individual characteristics of those who are exposed to body positive content. For example, significant interactions have been found

between viewing body positive content and weight perception, in that those who perceived their weight to be within normal limits had higher appearance satisfaction after viewing body positive content.⁸⁴ In our experimental studies, we did not see an interaction between weight perception and study condition on any of the studied outcomes. As body positivity has arisen from fat acceptance, it is necessary to further examine if demographic characteristics of the user, such as weight perception, are related to its impact. It is also imperative that this question be asked in a more diverse population so that race/ethnicity can be further examined. Individuals may have multiple marginalized identities, such as higher weight status and a minoritized racial or ethnic identity. Understanding how these identities play a role in the harms and benefits of viewing body positivity content is essential in creating content that not only generates the most benefit but also contributes to the reduction of health disparities.

Implications

Implications for weight bias

Individuals in larger bodies are at risk for a variety of physical and emotional health outcomes that have been linked to widespread weight stigma and anti-fat attitudes. Weight stigma has been identified in healthcare settings and is ubiquitous in media modalities. The experience and internalization of weight stigma is linked to poor metabolic health,⁵⁰ poor emotional outcomes such as depressive symptoms, and internalized bias. The experience of weight stigma is thought of as a physiological stressor that acts cyclically, increasing cortisol secretion, leading to further weight gain, and contributing to more weight stigma.¹⁴⁸ Individuals in larger bodies are marginalized within our society, and are not only on the receiving end of bias and stereotypes, but are also victims of microaggressions and outright discrimination. Discrimination related to weight status has been found in multiple areas such as education,

healthcare, and employment. Weight based discrimination in the work place can take the form of discriminatory hiring practices or promotions.¹⁴⁹ Weight status is not a guaranteed protected class when considering anti-discrimination policies. Furthermore, the reality of living in a larger body can lead to multiple daily stressors due to structures and systems of our current society. While there has been a push for size inclusivity in the fashion industry, individuals in larger bodies, especially those of the highest of body weights, often have difficulty finding clothing in their size.¹⁵⁰ When considering travel, airplanes, trains or subways, and even automobiles are not built for individuals of size. Individuals in larger bodies may be forced to pay for two seats on aircrafts due to the smaller size of the seats, putting them at even more of an economic disadvantage.¹⁵¹ The weight loss industry is a multibillion dollar per year industry, and advertisements related to weight loss are a common occurrence in screen, social, and print media.^{152,153}

Weight stigma also occurs at the interpersonal level. Among college-aged females, fat-talk, or negative remarks and judgements about one's body, is commonplace.¹⁵⁴ Additionally, weight based bullying or teasing can occur in all age groups.¹⁵⁵ Adults in larger bodies are often on the receiving end of much vitriol and condemnation about their body size, and weight stigma has been identified in both romantic and social relationships.¹⁵⁶ Considering both the widespread existence of weight stigma as well as the deleterious consequences associated with it, understanding how to best mitigate weight stigma becomes highly important to both the individual and society.

Body positivity is derived from the Fat Acceptance/Liberation Movement, and ideally would be helpful for the very people that the movement was developed to protect. Findings from Aim 1 indicate that agreeing with mainstream body positivity is associated with many positive

characteristics related to eating disorder risk, and that agreement with fat liberation in addition mainstream body positivity may be uniquely protective. One example of this was the higher body functionality appreciation found for those who had agreement with both mainstream body positivity and fat liberation. This is a hopeful finding given that existing research points to body functionality appreciation as a possible tool in the reduction of weight stigma.¹⁵⁷ It may be that public health professionals working within online and social media spaces should aim to promote the constructs present within mainstream body positivity movement while also retaining core beliefs of fat liberation.

As mentioned previously, there is conflicting evidence to support the role of counterconditioning approaches in changing anti-fat attitudes.^{87,158} In both Aim 2 and 3, exposure to all types of body positive content was associated with reductions in anti-fat attitudes from pre to post exposure. It may be that the type of body positivity content does not necessarily matter when aiming to reduce anti-fat attitudes. However, it must also be noted that changes in anti-fat attitudes were seen for the *control* condition. The finding that those in the *control* condition also experienced reductions in anti-fat attitudes is promising, especially due to the conflicting findings of counter conditioning approaches. It may be that public health professionals can aim to change anti-fat attitudes with inspirational or motivational content unrelated to bodies. There is evidence to support that exposure to motivational quotations is positively associated with measures of happiness, life satisfaction, and well-being.¹⁵⁹ While there is not enough evidence to support the use of motivational quotes in the reduction of anti-fat attitudes, this study does provide preliminary rationale for further investigation of the utility of motivational quotes.

Implications for disordered eating risk

This study provided several important findings when considering how mainstream body positivity and exposure to body positive content may be associated with disordered eating risk. When examining the findings in Aim 1, no associations were found between agreement with mainstream body positivity and any of the risk factors for disordered eating. However, global eating disorder risk was lower for those who had agreement with fat liberation. Furthermore, both agreement with mainstream body positivity and agreement with fat liberation was associated with protective factors such as body functionality appreciation.

Like the findings on anti-fat attitudes, all measures of state body satisfaction improved from pre- to post- exposure in Aims 2 and 3, and there was no difference between body positive content and the control group. The only significant difference was found on state appearance satisfaction in that greater improvements were seen for those who viewed images of *fat bodies + words*, providing support for expanding size diversity in body positive content. Despite the possibility that this finding is the result of a mechanism that itself is anti-fat (i.e. downward social comparisons), this study provides support for inclusion of a diverse range of bodies within body positivity content, which may have additional benefits. Within television media, the inclusion of diverse characters portrayed in a positive manner has been linked to positive attitudes of minoritized sexual and racial identities.¹⁶⁰ Furthermore, the population in this study identified themselves as being mostly of “normal” weight status. Little is known at this time on how the inclusion of fat bodies within the body positivity movement affects those who identify as being in a larger sized body. Until more evidence is available for how body positivity content affects the most marginalized of individuals, it is best to lean towards inclusion to promote beneficial outcomes regarding disordered eating risk.

Future Research

While there was some variability in race/ethnicity of the sample, especially the high percentage of participants who identified as Asian American or Pacific Islander, it is critically important that the effect of body positivity on risk and protective factors be examined in minoritized populations, especially in individuals who identify as Black or Indigenous people of color (BIPOC). Furthermore, this study examined the role of the body size of the image and association to risk factors and protective factors for disordered eating, as well as anti-fat attitudes. Future studies should consider examining the role of demographic characteristics of social media users and how these interact with exposure to various types of body positive content. As mentioned previously, body positivity content is heterogeneous in nature and likely reflects a wide range of perspectives. Research questions should be expanded to include a variety of body positivity perspectives (including body neutrality) and should also aim to examine how other types of creator characteristics affect outcomes (i.e., influencer status, presence of disabilities, non-binary gender presentations, etc.)

A separate but equally important line of research would be to examine how viewing body positive content is associated with nutrition and physical activity related outcomes. Critics of body positivity claim that body positivity “promotes obesity” or “promotes unhealthy behaviors.” Indeed, this phenomenon was observed in Aim 1, where 13% of the sample agreed with the concept that body positivity is about the “promotion of obesity.” Preliminary research suggests that body positivity does not lead to unfavorable nutrition outcomes. In an experimental paradigm, women who viewed body positive content did not choose more calories or less nutritious food than the control group.¹²⁵ The idea that body positivity could be harmful in that it promotes eating behaviors deemed as unhealthy is likely based off the postulation that body positivity could increase body satisfaction, which would lead to less dieting behaviors. However,

body satisfaction is linked longitudinally with higher levels of health-enhancing behaviors.¹⁶¹

Research should examine how exposure to body positivity is associated with nutrition and physical activity related outcomes to help public health professionals understand more about whether, how, and for whom body positivity is helpful or harmful.

Appendices

Appendix A : MyVoice Preliminary Data Codebook

Question 1: Hi MyVoicer! Have you ever heard of the body positivity movement or seen #bodypos? Where?

1a: Yes or No

- **YES:** Coded as 1 if answer includes “yes,” “yeah,” or any other iteration of this word to indicate that they have heard of the body positivity movement.
- **NO** Coded as 0 if answer includes “no,” “nope,” or any other iteration of the word to indicate that they have not heard of the body positivity movement.

1b: If YES: Did tell us where or did not tell us where?

- **DID TELL US WHERE:** Coded as 1 if they mention where they had heard of body positivity.
- **DID NOT TELL US WHERE:** Coded as 0 if they did not mention where they had heard of body positivity.

1c: If DID TELL US WHERE: On social media or not on social media or online?

- **ON SOCIAL MEDIA:** This code is given a 1 if the answer indicated that body positivity was seen on social media. Examples include “on social media,” “SM,” or names of specific social media sites such as “Facebook,” “Instagram,” etc. Exclusion criteria: Do not code this if the individual specifies “online” but does not specify any of the above examples of social media.
- **NOT ON SOCIAL MEDIA (OR ONLINE):** This is coded as 1 if the answer indicates that body positivity was seen somewhere other than social media or online. Examples include: “in class,” “on campus,” “friends or family,” “magazines,” etc.
- **ONLINE:** This is coded as 1 if the answer specifies that body positivity was seen specifically online but does NOT mention social media. Exclusion criteria: “Social media” or specific social media sites listed such as “Facebook,” “Instagram,” etc.

1d: If ON SOCIAL MEDIA, what type of site?

- **Did not specify type of social media:** This code is given a 1 if the answer did not specify a specific site of social media. Example answers would be: “on social media” or “SM.” Exclusion criteria: If answer specifies a social media site, such as Facebook, Instagram, etc., do not code this.

(The following codes are not mutually exclusive; answers can include multiple social media sites.)

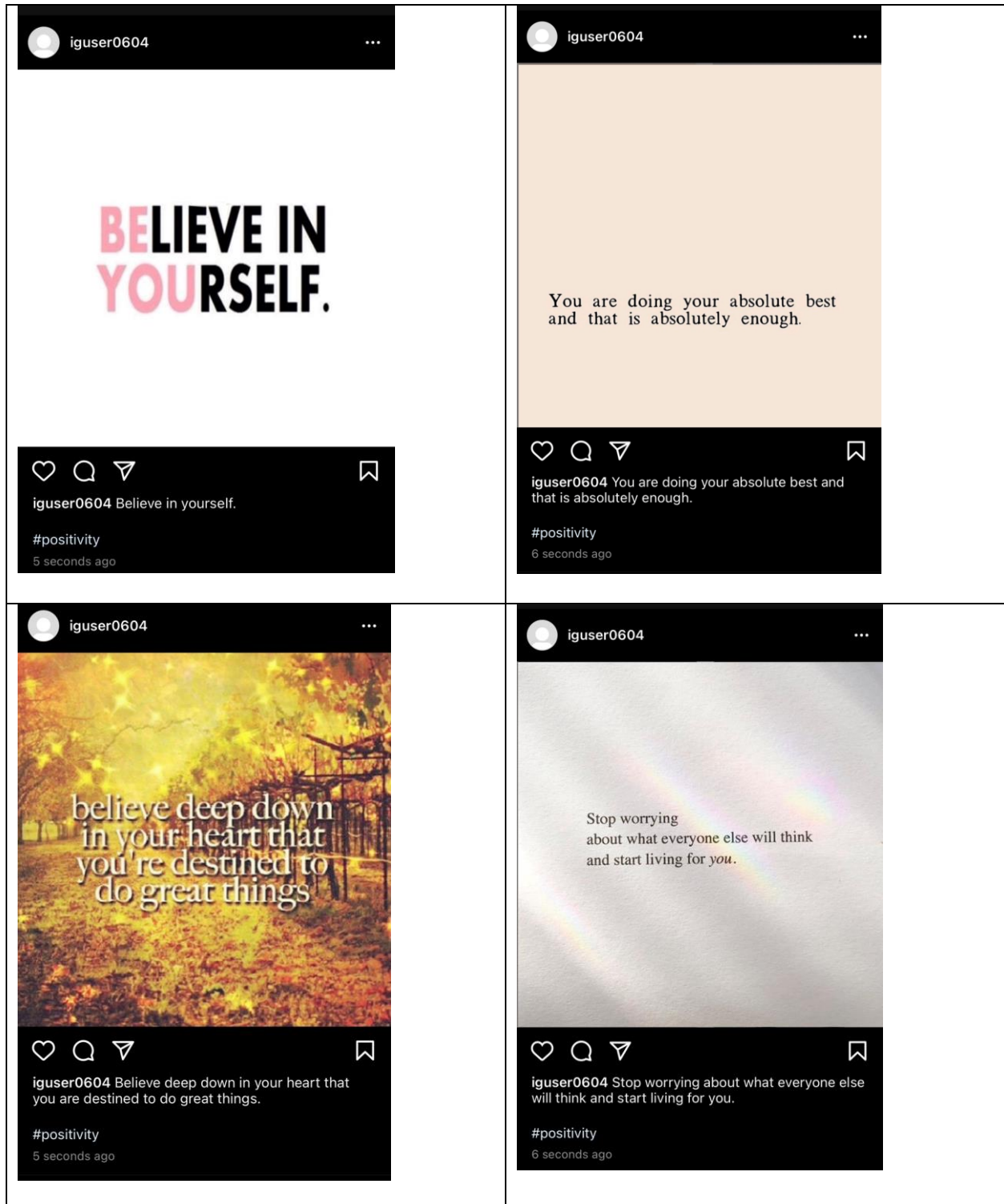
- **Instagram:** This code is given a 1 if the answer specifies “Instagram” or “Insta” or “IG.”
- **Tumblr:** This code is given a 1 if answer specifies “Tumblr.”
- **Twitter:** This code is given a 1 if answer specifies “Twitter” or “tweets.”
- **YouTube:** This code is given a 1 if answer specifies “YouTube.”
- **Facebook:** This code is given a 1 if answer specifies “Facebook” or “FB.”
- **Reddit:** This code is given a 1 if answer specifies “Reddit.”

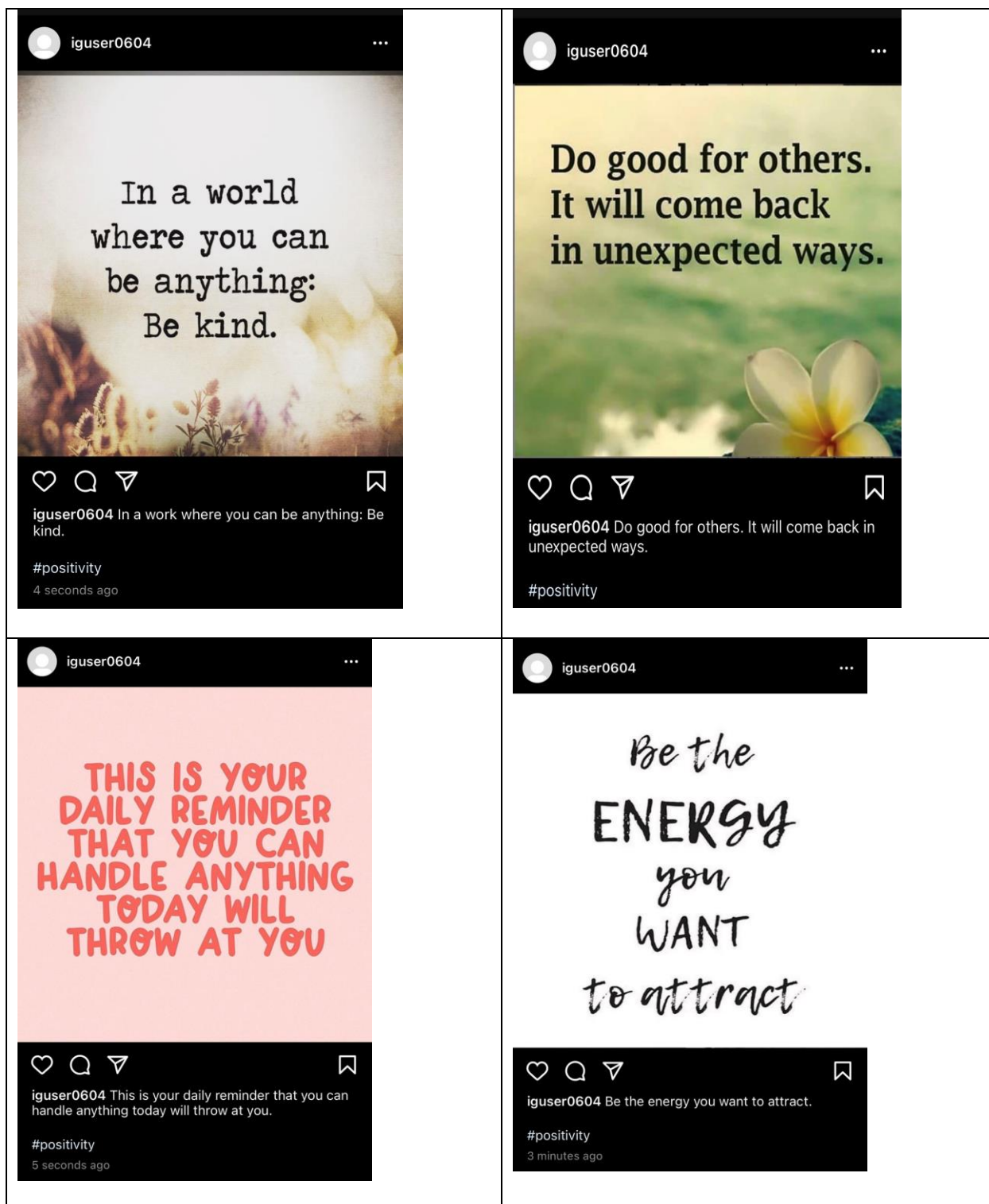
Question 2: How would you define the body positivity movement? If you haven't heard of it, j (Answers to this question may contain multiple themes. Each theme will be coded separately within the excel file and should receive a "1" if the theme is present. For example: You could have a code that indicates that body positivity is about acceptance of one's body, but then also goes on to shame people of higher body weights. Both would be coded with a "1").

- **BODY DIVERSITY:** This code is meant to capture acceptance of varying body types, or diverse bodies. It is also meant to capture acceptance of commonly marginalized bodies, such as those of higher body weights or with physical disabilities. Examples include: "All bodies are good bodies," "accepting all types of bodies."
- **SELF-ACCEPTANCE:** This code is meant to capture acceptance of one's OWN body or acceptance of one's looks, or "self." Examples include: "Accepting my body as is" or "accepting myself."
- **LOVE/EMBRACEMENT/POSITIVITY:** This code is meant to capture more than acceptance of one's body. "Loving" or "Embracing" or "Being positive" about one's body would be coded here. This code could also indicate embracing the truth of one's appearance, i.e.. not engaging in photoshop, etc. Examples include: "Loving my body" or "Embracing the way I look," or "Being positive about my body."
- **NO BODY SHAMING:** This code is meant to capture answers that indicate that body positivity is about not body, weight, or appearance shaming; not judging other people's bodies. Examples include: "Not body/fat shaming someone" or "not judging other people's bodies."
- **REJECTION OF SOCIETAL STANDARDS:** This code is meant to capture answers that indicate that body positivity is about rejecting societal beauty standards or rejecting body ideals. Examples include: "Rejecting beauty standards," or "Not changing my body to meet a standard/ideal."
- **GENERAL NEGATIVE:** This code is meant to capture overall negative definitions of body positivity. This could include fat or body-shaming answers. For example: "Body positivity promotes obesity," or "Body positivity shames thin people."
- **GENERAL POSITIVE:** This code is meant to capture overall positive definitions of body positivity that do not fit within the other categories. When coding this, if an answer indicates positive thoughts about positivity, but it does not fit within the other themes, this category can be selected. For example: "Body positivity is good" or "Body positivity helps self-esteem."
- **BODY POS AS A MOVEMENT:** This code is meant to capture answers that indicate that body positivity as a positive movement. For example, words such "advocacy," "movement," "raising awareness," "advocating," or "campaigns," would indicate that this should be coded.
- **HEALTH OVER BEAUTY:** This code is meant to capture prioritizing health over beauty standards or taking care of one's body. For example: "Taking care of one's body," or "Trying to be healthy rather than skinny."

Appendix B: Health and Media Stimulus Images

Figure B.1 Control images





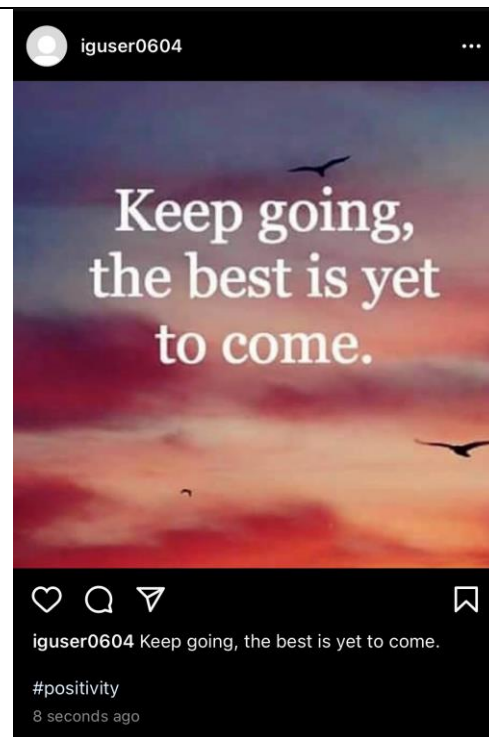
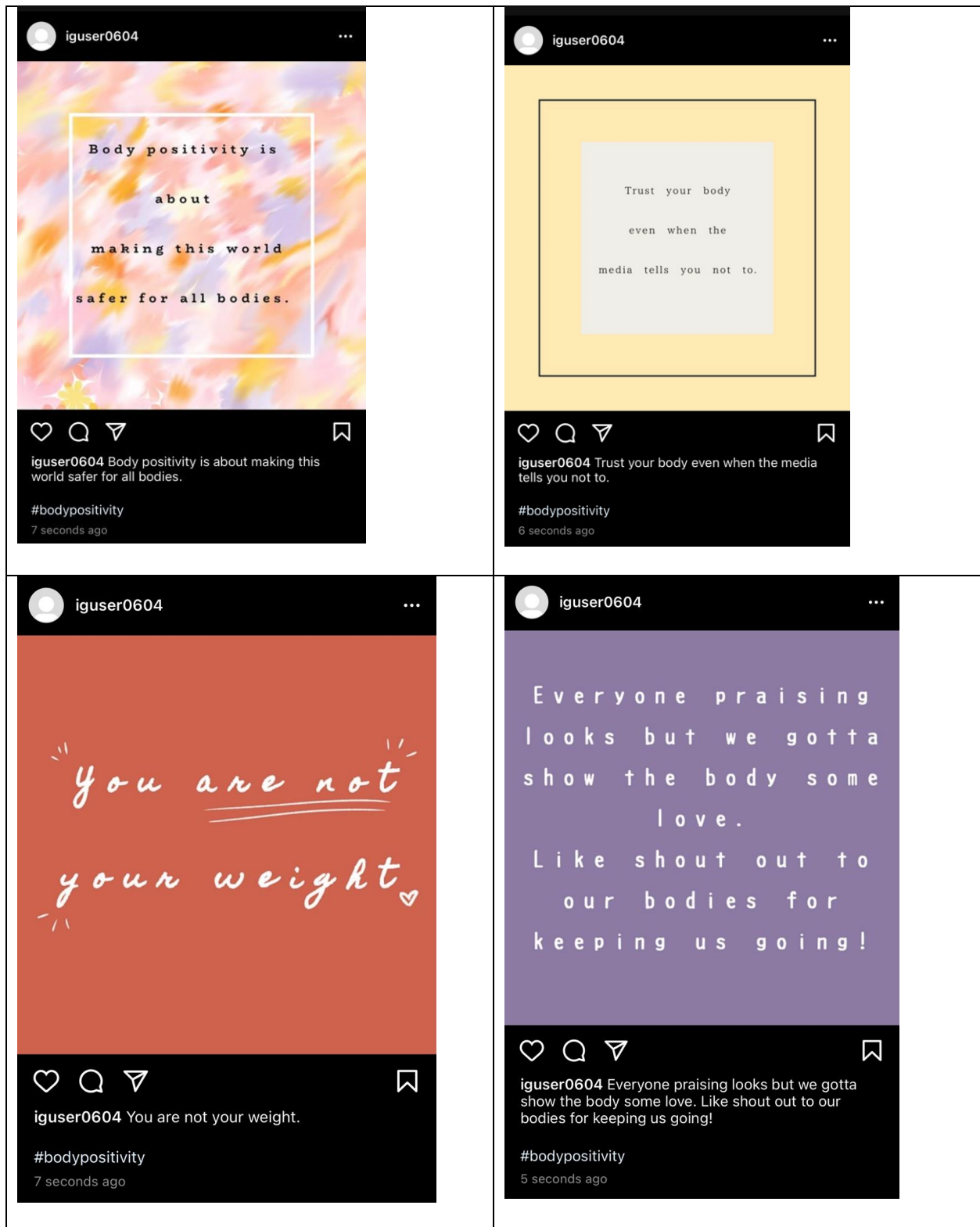
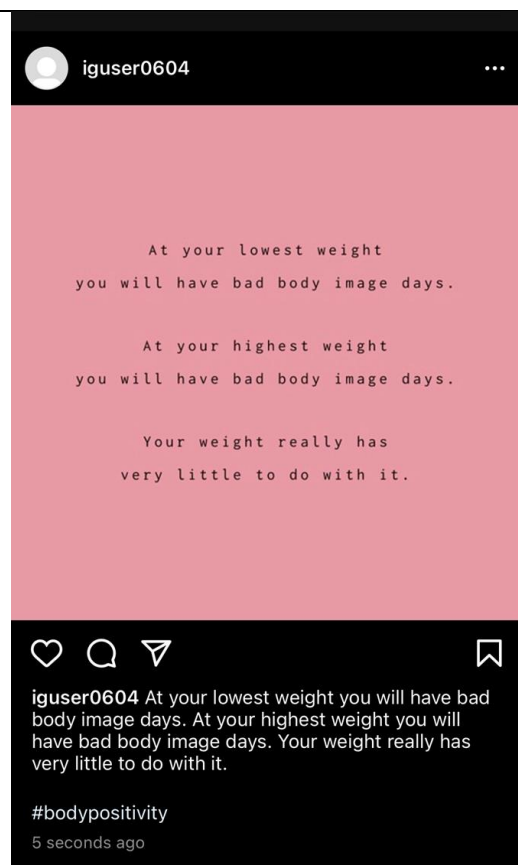


Figure B.2 Images of words only body positive content





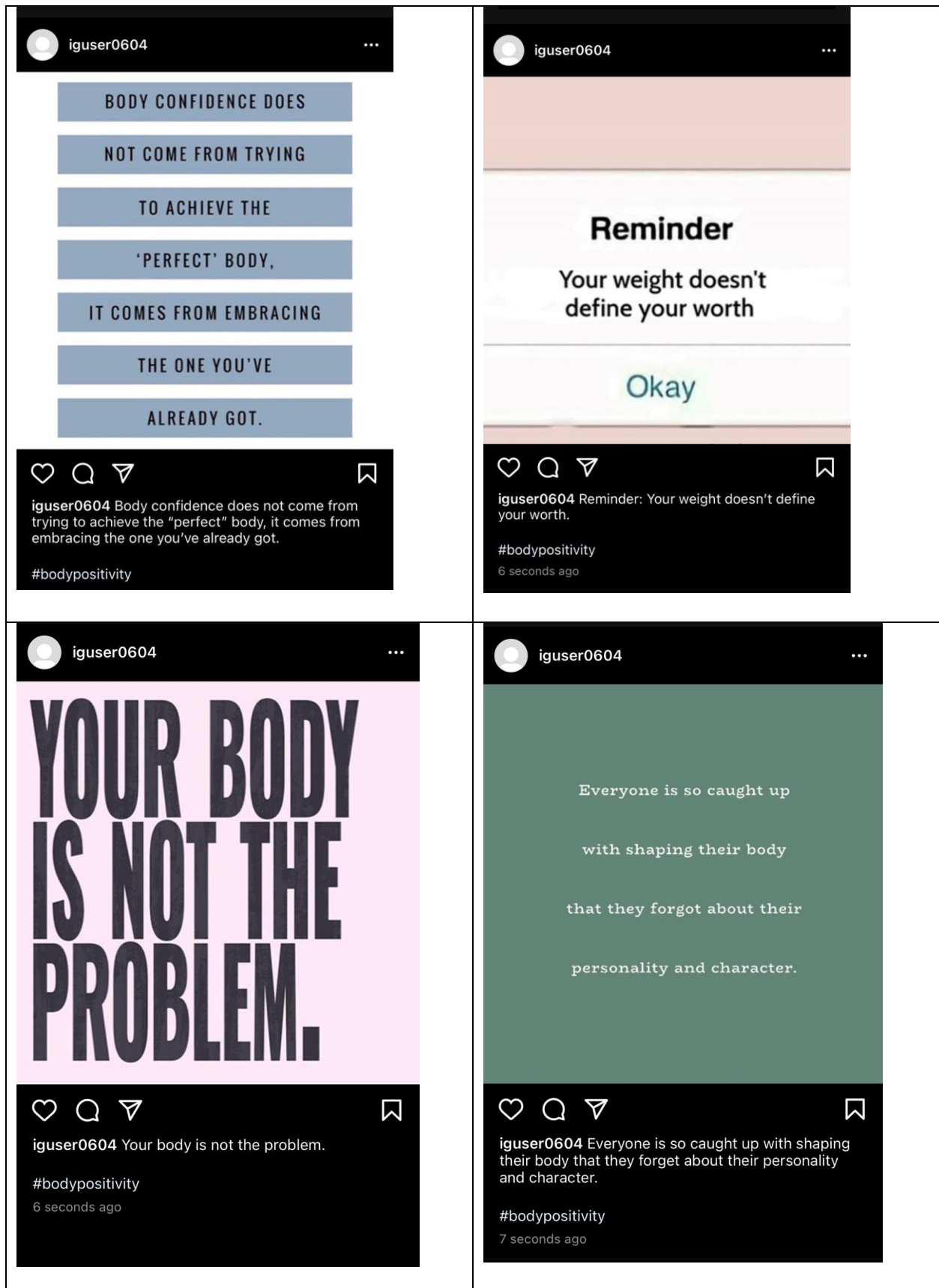
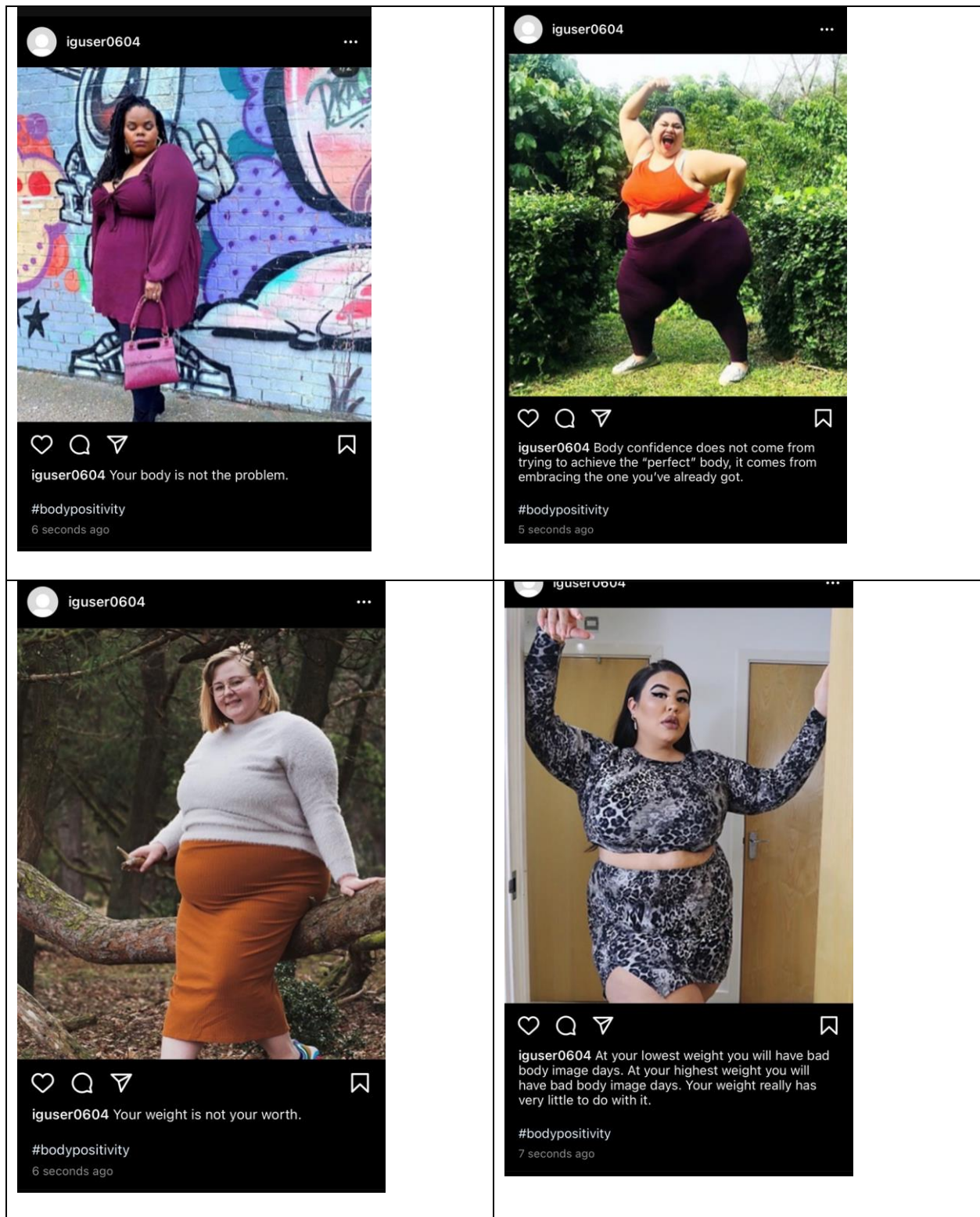
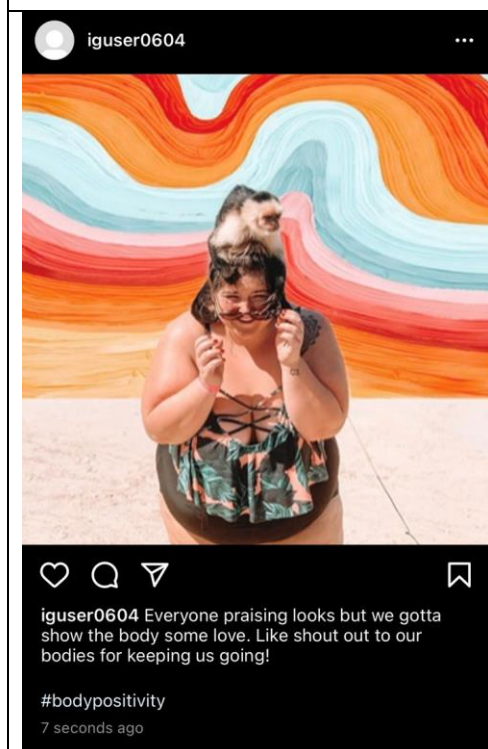
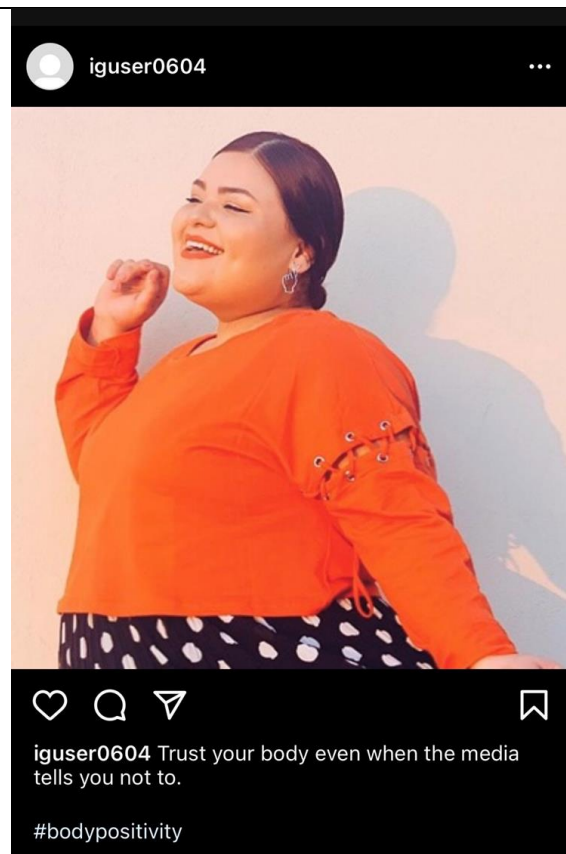
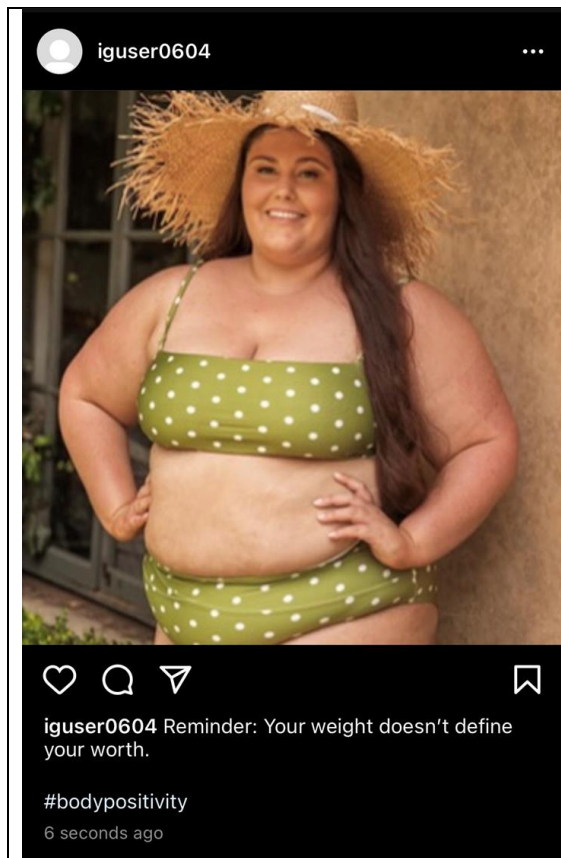


Figure B.3 Images of words + fat bodies body positive content





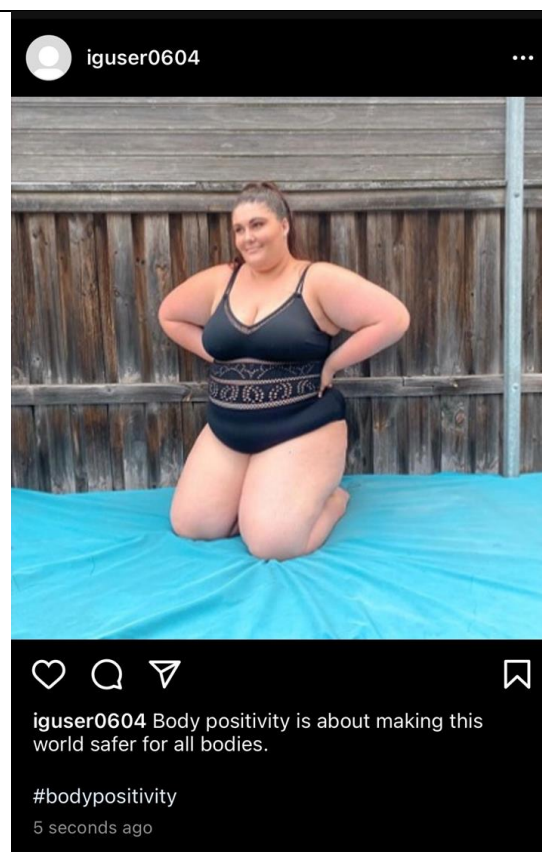
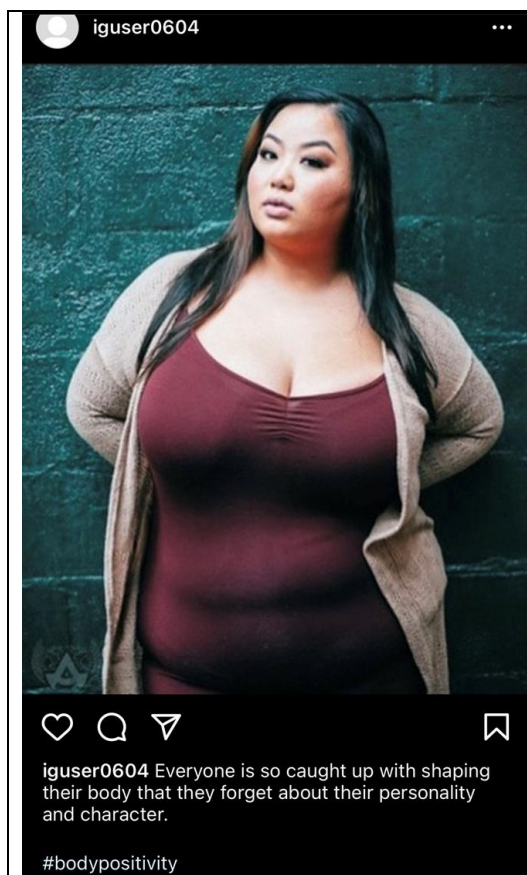
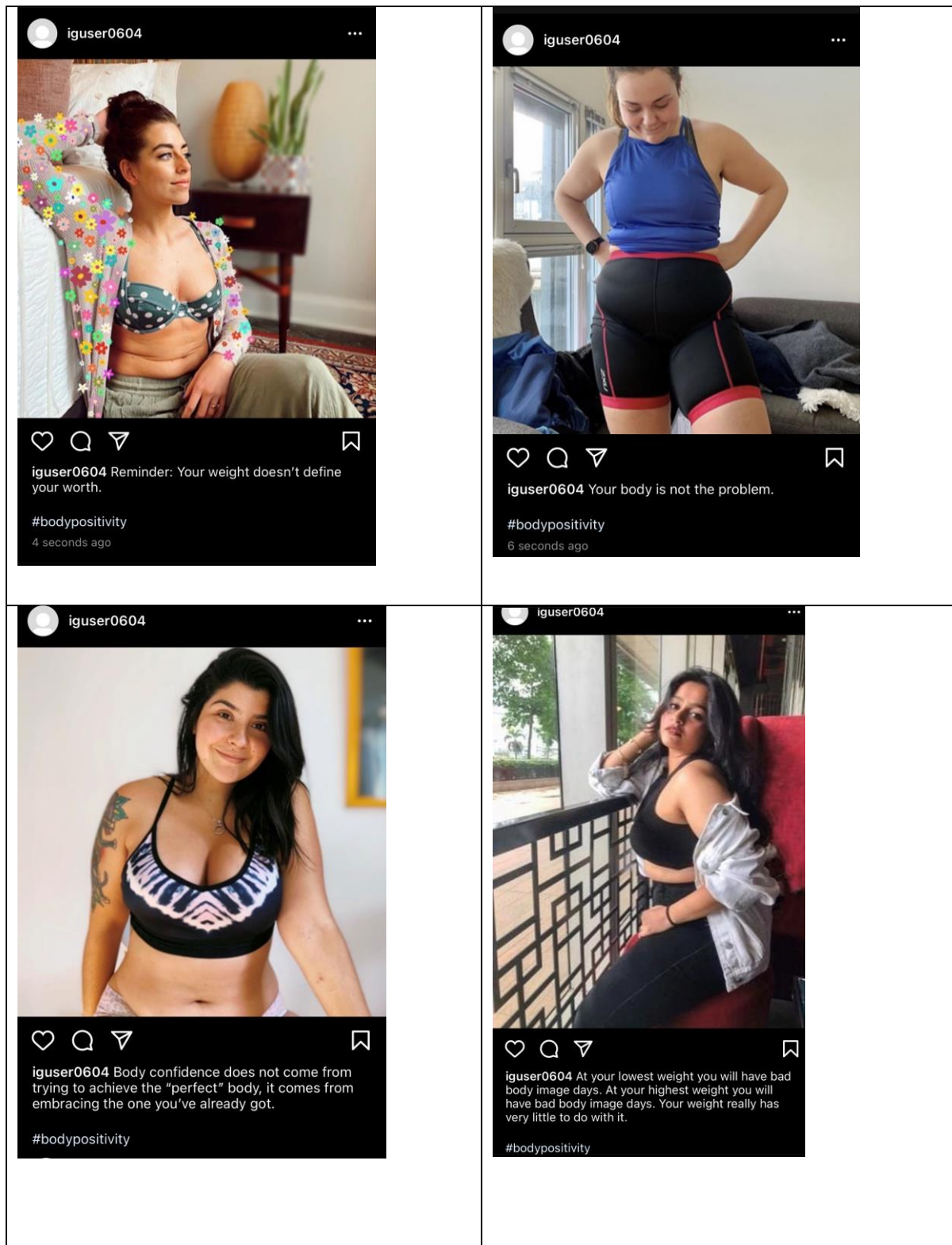
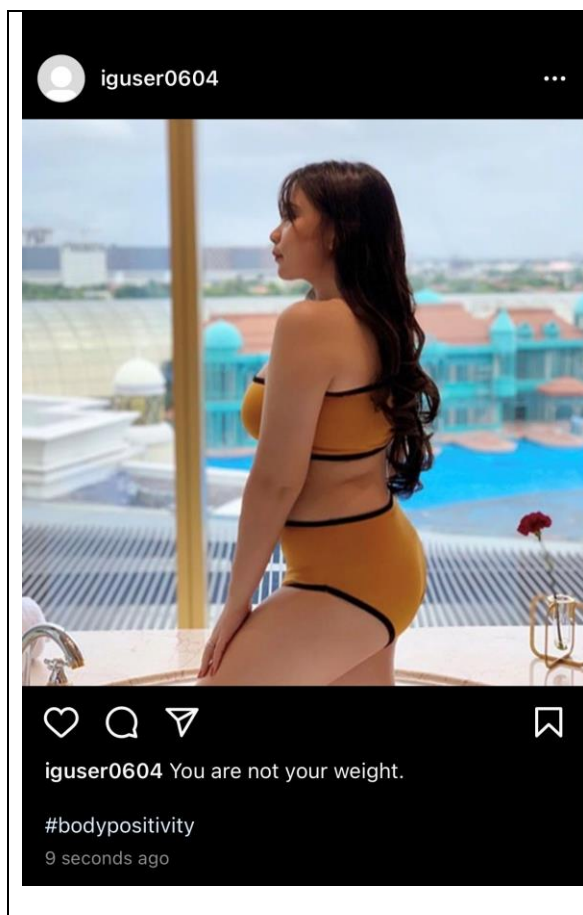
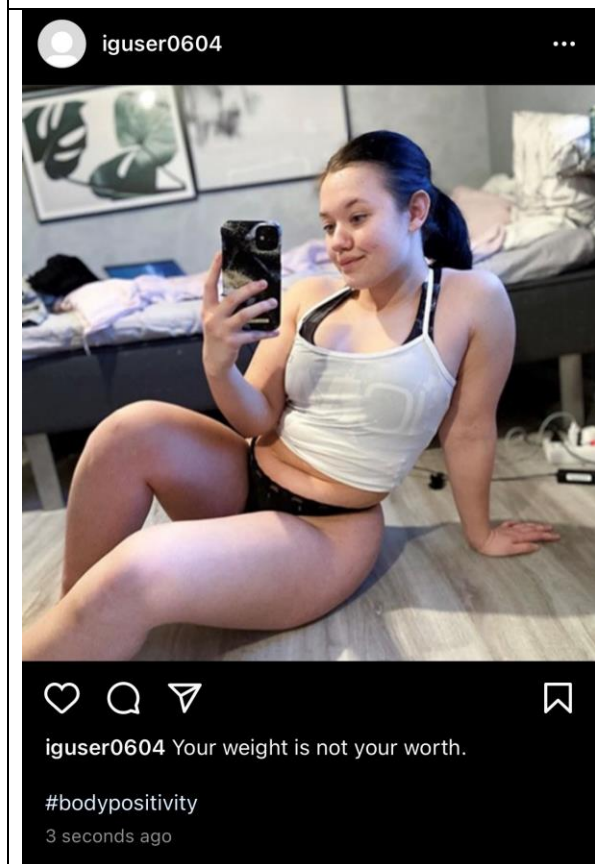
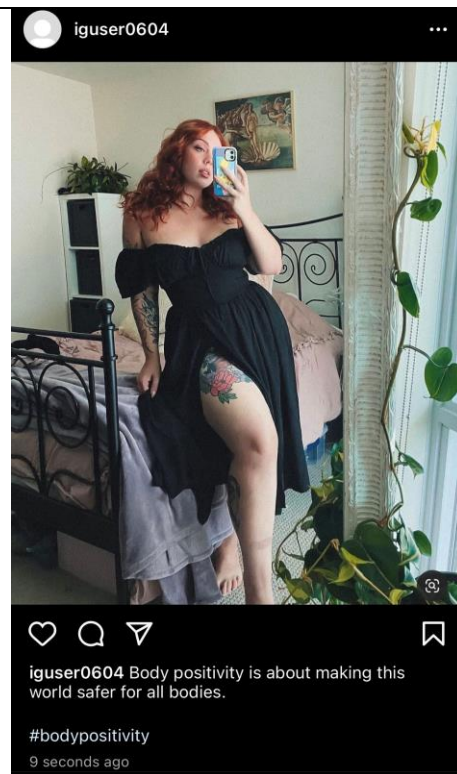


Figure B.4 Images of words + mid-size bodies body positive content







Appendix C : Health and Media Study Protocol

Recruitment

1. Recruitment email sent to 2,500 individuals via registrar's office
 - a. Recruitment email has link to Qualtrics inclusion screener
 - i. https://umich.qualtrics.com/jfe/form/SV_5vSBuDx9kbZpESW

Hello!

We are recruiting students to participate in a short study on social media and health. If you are interested in participating, follow the link below to see if you are eligible to complete the study! If you are eligible, you will receive a separate email with a link to the full study. Participants who complete that full study visit will be paid \$10.

For further questions, please contact the study team at healthandmediastudy812@gmail.com.

Thank you!

2. Interested subjects fill out Qualtrics inclusion screener
3. Each weekday, project coordinator sorts screener and study visit responses
 - a. Inclusion screener
 - i. A spreadsheet of new inclusion screener submissions is downloaded in CSV form
 1. This spreadsheet will contain all inclusion screener entries that have been COMPLETED since the last download
 2. Save as
Health+and+Media+Inclusion+Screener_(date/time)_forimport
 - ii. RA sorts into eligible and ineligible based on introductory responses (not EDEQ)
 - iii. RA uploads into REDCap
 - iv. Refine eligible and ineligible based on EDEQs score
 - v. Send study visit recruitment email to eligible participants:

Hello!

You are receiving this email because you have indicated a desire to participate in an important research study regarding social media and health, for which you will be compensated \$10! If you agree to take part in this study, you will complete the study in one sitting. If you leave the study at any time, your study visit will be cancelled, and you will no longer be eligible to complete the study or receive payment. The study visit takes roughly 45 minutes and should be taken on a personal computer or tablet (not a

phone). Please make sure you have adequate time and a private space to complete your full study visit.

Upon completion of the study, you will be directed to a separate link to provide your name and address which will be used to send your compensation in the form of a pre-loaded card. This information is not linked to your study data in any way, and it is simply used to provide you with compensation for your time.

If you would like to participate, click the link below to complete an informed consent form. Please be sure you have **roughly 45 minutes** to complete the informed consent and survey before clicking this link. Once your informed consent form has been submitted, you will **automatically** be prompted to start your study visit which will take roughly 40 minutes.

LINK

For further questions, please contact the study team at healthandmediastudy812@gmail.com.

Thank you!

- vi. Emails will be sent via study email address
 - 1. healthandmediastudy812@gmail.com
 - 2. Password: 99 percentile
- vii. Reminder emails will be sent after 5 business days

Hello!

You are receiving this email because you have indicated a desire to participate in an important research study regarding social media and health, for which you will be compensated \$10! If you agree to take part in this study, you will complete the study in one sitting. If you leave the study at any time, your study visit will be cancelled, and you will no longer be eligible to complete the study or receive payment. The study visit takes roughly 45 minutes and should be taken on a personal computer or tablet (not a phone). Please make sure you have adequate time and a private space to complete your full study visit.

Upon completion of the study, you will be directed to a separate link to provide your name and address which will be used to send your compensation in the form of a pre-loaded card. This information is not linked to your study data in any way, and it is simply used to provide you with compensation for your time.

If you would like to participate, click the link below to complete an informed consent form. Please be sure you have **roughly 45 minutes** to complete the informed consent and survey before clicking this link. Once your informed consent form has been submitted, you will **automatically** be prompted to start your study visit which will take roughly 40 minutes.

LINK

*For further questions, please contact the study team at
healthandmediastudy812@gmail.com.*

Thank you!

Intervention

1. Participants are randomized using Qualtrics to one of 10 interventions
 - a. 5 categories with 2 versions each
 - b. A total of 50 participants will be shown each intervention
2. Intervention
 - a. Pre survey
 - b. Video
 - c. Post survey
3. Completed pre/post surveys are exported from Qualtrics and imported into REDCap

Payment

1. Participants are paid via HSIP pre-loaded card

Appendix D : Health and Media Study Debriefing

Debriefing Form: HUM00165104

Thank you for agreeing to participate in this study! The general purpose of this research study is to understand how the body positivity movement on social media may influence our body image and other risk factors for disordered eating. We also wanted to examine how different types of these images may affect people.

We asked people to participate in this study who were currently enrolled as undergraduates at the University of Michigan, Ann Arbor, identified as female, spoke fluent English, and were between 18-25 years of age. In this study, you were asked to view a series of Instagram posts about body positivity. You may have been given images that were of women of larger bodies, or you may have been given images that were just words. You may have been given images that were not related to body positivity at all. We asked you to answer questions about your body image, before and after you viewed these posts and comments, so that we can examine whether what you saw on social media influences how you feel about your body. The results from this study will provide us with information on whether body positivity may be a potential intervention for the prevention of body dissatisfaction and disordered eating.

If you feel especially concerned about negative thoughts about how you feel about your body, or if you have concerns about your relationship with food, you can contact University of Michigan Counseling and Psychological Services (CAPS) (734-764-8312).

Thank you for your participation in this study. If you have further questions about the study, please contact the primary investigator Kelley Borton, MPH, RDN [bortonk@umich.edu, Phone: 313-522-7967] or the faculty advisor on this project Kendrin Sonneville [kendrins@umich.edu, Phone: 734-763-8789].

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