UNDERSTANDING AND IDENTIFYING RISK FACTORS FOR INDIVIDUALS EXPERIENCING NEGATIVE PSYCHOLOGICAL OUTCOMES FOLLOWING SOCIAL MEDIA USE: A STATISTICAL ANALYSIS AMONG FEMALES WITHOUT A HISTORY OF AN EATING DISORDER

by

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ABSTRACT

MARIE A. HAYES. Understanding and identifying risk factors for individuals experiencing negative psychological outcomes following social media use: A statistical analysis among women without a history of an eating disorder. (Under the direction of DR. AMY PETERMAN)

As the use of social media for accessing health information becomes increasingly more nuanced and commonplace, as does our understanding of the impacts on users. Using social media to access health information has increased in popularity, and researchers have begun to explore the potential impacts of doing so. Concerns have emerged over the similarities between some fitness content on social media and eating disorder promotional content, often called "fitspiration" content. The current study attempts to explore why individuals use social media to access health and fitness information, and better understand who is at risk for body-related distress after engaging with different types of content available on social media that claims to be representing health and fitness. 222 participants provided information about their social media use and were randomly assigned to experimental conditions to evaluate three types of images from social media: health and fitness, fitspiration, and a control condition consisting of nature images. No conditional differences were found on a series of measures assessing body image and exercise attitudes after engaging with health content or "fitspiration" content. Maladaptive social media use and eating disorder risk factors did not explain body image distress in the current samples, as explored through SEM analyses. Open-ended questions reveal differential ways in which individuals use social media generally and for health content. Qualitative data also reveals some individuals demonstrate awareness and intentionality about the potential negative impacts engaging with fitspiration content can have. Potential interpretations of the current findings are explored, including a possible manipulation failure, and future directions are suggested.

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LIST OF ABBREVIATIONS

SNS Social networking sites (SNS)
Social Media (SM)
Pro anorexia (Pro-ana)
Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3)
Body mass index (BMI)
Hypothesis 1 (H1)
Hypothesis 2 (H2)
Hypothesis 3 (H3)
Structural equation modeling (SEM)
Amazon's Mechanical Turk (Mturk)
Human Intelligence Tasks (HITs)
Institutional Review Board (IRB)
Facebook Activity Scale (FAS)
Social Comparison Orientation (SSCO)
Weight Bias Internalization Scale- Modified (WBIS-M)
Obligatory Exercise Questionnaire (OEQ)
Rosenberg Self-Esteem Scale (RSES)
Body Shape Questionnaire (BSQ)
Diagnostic Statistical Manual (DSM-5)
Anorexia Nervosa (AN)
confirmatory factor analyses (CFA)
exploratory factor analysis (EFA)
Steiger-Lind Root Mean Square Error of Approximation (RMSEA)
comparative fit index (CFI)
Standardized Root Mean Square Residual (SRMR)

CHAPTER 1: OVERVIEW AND SIGNIFICANCE

Social networking sites or social media platforms (i.e. social media) are commonly used internet websites, or mobile phone applications, through which users can maintain or form relationships with other users. Social media is increasingly popular, with 72% of adults reporting using social media in 2021 (PEW, 2021). Social media users vary in age across the lifespan. For example, the youngest age at which a person can sign up for a Facebook account is 13 years, and younger adults make up the largest group of social media users- 84% of adults age 18-29 reported being on social media. While social media is popular with younger adults and adolescents, reports indicate that almost half (45%) of adults aged 65 and above currently use a social networking site (PEW, 2021). As billions of people across the lifespan are currently using social networking sites (Facebook, 2019) the ways in which these platforms are used continues to evolve. For example, a decade ago individuals reported primarily using social media to form new or maintain existing relationships (Brandtzæg & Heim, 2009). More recently, users have reported using social media to play online games with one another, view photos of others and post their own photos, and create and RSVP to events happening online and in person (Hayes, van Stolk-Cooke & Muench, 2015). Users also report using social media to view health and fitness information (Moorhead et al., 2013) including for support or accountability during initiation and/or maintenance of health behavior change (ex: increasing physical activity; Carpenter & Amaravadi, 2016). With such a laundry list of potential ways in which social media users can engage the sites, there has been an increased effort to understand the potential impacts that social media can have on its users.

While increased access to social support and health information can be viewed as a positive outcome of social media use, negative outcomes have also been reported, especially for

younger individuals. For example, one study found increased social media use is related to depression and negative social comparisons in emerging adults (Lup, Trub & Rosenthal, 2015). Moreover, youths who reported more than two hours of social media use per day were more likely to experience psychological distress and suicidal ideation (Sampasa-Kanyinga, 2015). Recent declines in mental health, especially among younger people, have been attributed to an increase in social media use by some organizations (Berryman, Ferguson & Negy, 2017). However, these broad generalizations are at times criticized because of research studies' lack of rigor in methodology and overinterpretation of results (Ferguson, 2017). Consequently, more effort is needed to fully understand the mechanisms through which psychological distress may be manifested because of social media use.

An additional line of research has emerged exploring the link between social media use and negative impacts on body image and disordered eating cognitions and behaviors. While this literature almost exclusively samples from emerging adult populations (i.e. individuals 18-25; Arnette & Tanner, 2006), viewing fitness content on social media (often abbreviated "#fitspiration") has been associated with increased body-anxiety and body-dissatisfaction (Robinson et al., 2017). This is problematic for multiple reasons. First, fitspiration content has been found to have many similarities to content promoting eating disorders (i.e. "thinspiration" content; Boepple & Thompson, 2016) therefore, fitspiration content may be considered closer to pro-eating disorder content rather than health or fitness content in the majority of the literature. This may be particularly problematic for users who do not realize this distinction and equate pro-eating disordered images and behaviors with health and fitness more broadly, thus inadvertently promoting unhealthy diet and exercise behavior among users.

Second, when researchers employ statistical methodology beyond correlational analyses, risk factors emerge which better explain negative effects of engaging with health content on social media. For example, a study of college women aged 18-25 revealed that negative body satisfaction following social media use is mediated by social comparison behaviors and internalization of the thin ideal (Fardouly Pinkus, & Vartanian, 2017). Moreover, in a meta-analysis of 20 research studies, Holland and Tiggemann (2016) found the ways in which social media is used often mediated the relationship between social media use body image and eating disordered outcomes. For example, using the photo feature (looking at other's photos or posting and viewing one's own photos) is more predictive of negative outcomes than time on social media alone (Meir & Gray, 2014). The meta-analysis concluded that more information and rigorous studies are needed to fully understand correlational findings supporting a relationship between social media use and body image or disordered eating (Holland & Tiggemann, 2016). This conclusion is similar to those drawn about print media's impacts on body-image, which posit disordered eating cognitions and behaviors are likely the result of an interaction between media exposure and individual characteristics, not simply media exposure alone (Levine & Chapman, 2011). In sum, a relationship has been found to exist between social media use and negative psychological outcomes. This relationship is likely more complex than simply the amount of time on the site predicting negative outcomes. More advanced methodological techniques are required to fully understand driving factors for negative outcomes.

As such, the following limitations in the literature have been identified when attempting to understand impacts of engaging with content on social media: (1) the current literature mostly focuses on the effects of engaging with health and fitness content on social media that has been found to be similar to pro-eating disordered content (i.e. "fitspiration" content; Tiggemann &

Zaccardo, 2016) rather than health and fitness content more generally. This is problematic because we do not fully understand the impacts of users engaging with health and fitness content that is not associated with eating disorder promotion. (2) Studies attempting to understand the impacts of health/fitness content on social media often do not incorporate social media use risk factors and eating disorder risk factors into one study, rather they often look at these independently; (3) simple research designs are often utilized (i.e. correlational designs or linear regression analyses) which appear to miss nuances in the relationship between engaging health/fitness content and negative outcomes. When more advanced methodology is employed (i.e. mediation or moderation analyses) factors emerge to explain the relationship between social media use and negative outcomes; and, finally, (4) current research almost exclusively samples from emerging adult populations, and ignores individuals who are older than this age group. This is problematic because previous research indicates there are differences in the ways in which these populations use social media (Hayes, van Stolk-Cooke & Muench, 2015), and the rates of negative outcomes associated with use (van Igen, Rains, & Wright, 2017). By only sampling from young adult populations we may be restricting variability in outcomes. To fully understand how health and fitness content might impact all social media users, we must expand our sampling procedures beyond recruitment of university-aged individuals, utilized more advanced analytic tools to account for the effects of other variables (e.g. identified risk factors for negative outcomes), and utilize health and fitness content that does not exclusively include those similar to pro-eating disordered content.

Research Aims:

AIM 1: To understand social media users' motives for viewing health and fitness content on social media.

AIM 2: Explore if the effects of viewing Health & Fitness content are different from fitspiration content.

AIM 3: Identify who may be at risk for experiencing negative outcomes following engagement with health and fitness content from social media.

Significance:

The proposed dissertation study attempts to understand the mechanisms through which negative psychological outcomes are experienced following engagement with health and fitness content on social media. More specifically, the project aims to understand what motivates users to view health and fitness content on social media, explore differential impacts of engaging with health and fitness content more generally versus health and fitness content similar to that which promotes eating disorders (i.e. fitspiration content), and identify factors that may explain the relationship between engagement with health and fitness content on social media and negative outcomes. Employing more advanced statistical methodology and combining existing findings in the literature will allow the researcher to identify pathways by which differential outcomes are observed. A better understanding of how negative outcomes are experienced following social media use will be imperative as social media popularity continues to increase across all age groups. Having a better conceptualization of the risk factors that lead to negative outcomes may help the development of interventions or preventative measures which can be implemented by SNS, users and/or concerned significant others. Finally, understanding the differences in how users respond to health and fitness content with and without eating disorder undertones will be important. Given some findings, which are reviewed below, that suggest viewing fitspiration content can produce negative outcomes for social media users, it may be problematic if users are unknowingly engaging with health content that has eating disorder undertones. If a user were to

take pro-eating disordered images and behaviors as suggestions on how to live healthy (e.g. very small portion sizes of low calorie food or over exertion during exercise), it is possible the user may inadvertently interpret unhealthy diet and exercise behavior as healthy, or may be susceptible to negative impacts of the eating disorder undertone content.

CHAPTER 2: REVIEW OF THE LITERATURE

Social Media Background

One platform through which digital media are commonly shared is social media, or social networking sites. Social networking sites or social media platforms (i.e. social media; SNS) have become commonly used internet websites through which users can maintain or form relationships with other users. Consequently, communities or networks of individuals with similar interests and/or friends who know one another can be formed. These communities allow network members or content followers to view and interact with content posted by others, and/or post their own original content for others to view and with which they can interact. As billions of individuals are currently using social media platforms (Facebook, 2019), these communities or networks can be extensive.

Social media platforms allow users to have a public or semi-public profile containing personal information which can be shared with and viewed by other users on the platform, and users can interact with other users creating a web of social relationships, or a network (Boyd & Ellison, 2007). In 2009, the PEW Research Center reported that approximately 65% of the United States used social media, with the number of users of some sites worldwide (i.e. Facebook and Instagram) exceeding 2 billion in 2019 (Facebook, 2019). Instagram alone surpassed the one billion user threshold in 2018. Historically, SNSs were accessed primarily by younger individuals (i.e. emerging adults aged 18-25), however, this has expanded to become more representative of the population at large, specifically with an increased number of users from the older adult age category (PEW, 2021). For example, 46% of adults 65+ were using social media in 2021 and 84% of adults aged 18-29 used these sites during that time (PEW, 2021).

In addition to expanded age demographic of users, we know that users have also expanded the ways in which they use SNS. Specifically, they have moved beyond exclusively using SNS to maintain or promote relationships. Additional capabilities available for social media users include creating and sharing in person and online events with others and engaging with photo content, either looking at or commenting on photos posed by others or posting photos themselves (Hayes, van Stolk-Cooke & Muench, 2015). Moreover, it is common for users to follow celebrities or other individuals, sometimes called "influencers", who they have never met in real life. Despite not always having a personal relationship with their followers or those whom they follow, social media users can still access photos or interact with (i.e. like, comment, share, etc.) content posted by these individuals.

It is particularly common for users to follow other users they do not know (i.e. celebrities, or "influencers") on the social media site Instagram. Because Instagram is primarily a photo-sharing platform, the photo feature of this platform is widely engaged with by Instagram users. Photos on SNS can be available publicly or only to one's friend network, but are often categorized by the poster using hashtags (# symbol). These hashtag categories are typically used to label the content of the images or posts. In response, users can comment or "like" posts, or they can search and follow a specific post category (i.e. hashtag; Turner & Lefevere, 2017). In addition to these activities, an emerging body of literature suggests users commonly access health and fitness information on SNSs (Carrette et al., 2015). This can involve simply viewing health and fitness content posted by other users, or can involve actively seeking support or accountability from other users during initiation and/or maintenance of health behavior change.

Because the ways in which social media are being used are rapidly evolving, and the time spent on the sites by users is increasing (Twenge, Joiner & Rogers, 2018), a line of research has

emerged looking at the potential outcomes of social media use on well-being, briefly reviewed below, and on body image more specifically. It is important to note that as studies move beyond correlational analyses and linear regressions, risk factors have emerged both in the ways that social media are used and in individual characteristics that increase the likelihood that negative outcomes will be observed.

Social Media's Impact on Well-Being

While specific negative impacts of viewing health and fitness content from social media is reviewed below, an additional more expansive review of the effects of social media use is explored in this section. The literature examining the impacts of social media use on overall well-being of users has begun to move beyond linear regression and correlational analyses. As it has done so, more nuanced relationships have been revealed highlighting it is not simply spending time on these sites that can lead to negative outcomes but, rather the ways in which social media are used can impact users differently.

Social media use has been linked to various negative psychological outcomes including depressive symptoms, lower self-esteem, adjustment difficulties (Lup, Trub & Rosenthal, 2015), and suicidal ideation (Sampasa-Kanyinga, 2015). In a correlational analysis of undergraduate college students, Kalpidou, Costin and Morris (2011) found a negative relationship between the number of minutes spent on Facebook per day and self-esteem. More resent research has attempted to understand how the ways in which social media sites are used, not simply the amount of time on the sites, can lead to negative outcomes. Identified problematic ways of using the site include (1) users not being intentional about their social media use (Sagioglou & Greitmeyer, 2014), (2) social comparison tendencies of users (e.g.: a fear of missing out on other's activities; Oberst, Wegmann, Stodt & Brand, 2017, and an increased desire for popularity

(Beyens, Frison & Eggermont, 2016), and (3) higher engagement with the photo feature of social media platforms (Meire & Gray, 2014).

Researchers in Germany attempted to understand the relationship between social media use and negative well-being in a two-part study. In a study of German young adult males, mean age of 22.1, positive mood was negatively correlated with the self-reported amount of time spent on Facebook immediately prior to participating in the research study (Sagioglou & Greitmeyer, 2014). The authors then used a mediation analysis to reveal that more purposeful time on social media negated the negative impact that internet use had on participants mood. In this study, purposeful time on the internet was experimentally manipulated. Participants in the purposeful condition were instructed to engage with Facebook for 20 minutes by chatting with others, posting onto the site, or looking at photos. Individuals in the browsing condition were told to mindlessly browse the internet, not use social media. While this study did not explore impacts of the ways in which users engaged with SNSs, rather the internet versus SNSs, it suggests that intentional social media use may not produce the same negative outcomes as mindlessly using the internet (Sagioglou & Greitmeyer, 2014).

Another study exploring the impact that SNSs can have on self-esteem exemplifies the need to explore relationships beyond correlations or linear regression. Sampling from 1,819 high school students in Australia, Blomfield Neira and Barber (2014) used hierarchical regression to reveal that social media activity can have positive outcomes on self-concept, but having a greater investment in social media was associated with depressed mood and lower self-esteem (Blomfield Neira & Barber, 2014). While the analytic techniques employed in this study were more advanced and informative than correlational analyses, limitations exist in that the researchers did not use validated measures of self-esteem or depression. As exemplified above,

the impacts social media use on well-being continue to be investigated and more advanced methodology is being employed to expand our understanding of this complex relationship.

More recent research studies suggest there may be other factors which mediate or moderate the relationship between social media use and negative psychological outcomes. Some of these factors for adolescents include social comparison behaviors such as having a fear of missing out on other's social interactions (i.e. "fomo"; Oberst, Wegmann, Stodt & Brand, 2017), and increased need for popularity (Beyens, Frison & Eggermont, 2016). These findings are mostly explored in younger samples. Interestingly older social media users do not appear to exhibit such negative outcomes in the literature, and even report positive outcomes such as increased connectedness following social media use (Sinclair & Grieve, 2017). More research is needed sampling from more age diverse populations to fully understand the potential impacts, both positive and negative, that social media can have on users. While depression and low self-esteem are some of the most commonly explored problems because of social media use (for a review see: Baker & Algorta, 2016), these outcomes are also associated with decreased body satisfaction, disordered eating, and disordered eating or body image concerns (Baker & Algorta, 2016). Such outcomes are commonly explored in the context of understanding exposure to health and fitness content on social media.

Health Content on Social Media

Numerous studies have shown that it is common to use social media to search for health and fitness information (e.g.: Carpenter & Amaravadi, 2016; Carrotte et al., 2015; Moorhead et al., 2013). Commonly accessed health content includes food advice and choices (The Hartman Group, 2012), reading others' commentary about a health or medical issue or experience, searching how to treat an illness, exploring health maintenance suggestions (PEW, 2009) and

nutritional information (e.g. recipes or restaurant choices; Vaterlaus et al., 2015). Social media became an increasingly popular way to access health information during the COVID-19 pandemic (Zhong et al., 2021).

One study found up to 90% of an emerging adult sample say they would trust health information found on social media (Carrotte et al., 2015). Moreover, 42% of an adult sample of social media users reported that their health decisions relating to things such as diet, stress management, and exercise could be impacted by content viewed on social media (Corrette et al., 2015). These findings have been established for a variety of users, including young adults aged 18-25 (Vaterlaus, Patten, Roche, & Young, 2015) athletes (Bourke et al., 2018), and adults aged 18-65 (Carrette et al., 2015) to name a few. Because this is an emerging field of study, we do not yet fully understand the impacts of accessing health and fitness content on social media. The current literature demonstrates both negative and positive outcomes from using social media in this way.

As increases in accessing health content on SNS are observed, researchers are beginning to explore the outcomes of doing so, which are both positive and negative. One example of a positive outcome of engaging with food-related health information on social media is that after viewing healthy recipe posts, users reported feeling as though they had learned new healthy recipes, which they could cook at home (Vaterlaus et al., 2015).

Researchers have also begun to explore the effectiveness of integrating social media into interventions to improve health. Social media can be used to initiate or maintain health behavior change through fitness tracking applications that can be linked to social media profiles and viewed by members of one's community. One example of a health behavior change intervention utilizing social media is the ability to synchronize physical activity monitoring devices with

social media accounts, and to share the data with other members of a user's network. In one study, a positive relationship was found between the number of connections in a user's social media community, volume of exercises reported by those community members, and participant's exercise levels tracked by activity-tracking programs (Carpenter & Amaravadi, 2016). Moreover, social media websites have also been found to be helpful for users to connect with others and successfully lose weight (Meng, 2016). In sum, the research is optimistic about the potential benefits that social media can contribute to initiating and maintain health behavior change. While positive outcomes have been found using social media for health behavior change accountability, a review from 2016, Dahl, Hales, and Turner Mc-Grievy highlights the continued need for more information on the effectiveness of these types of interventions, and a greater understanding of the effects of social media on weight-loss behaviors more generally.

Fitspiration on Social Media

Research into possible outcomes of engaging with health and fitness content on social media has looked at the effects of engaging with #fitspiration content on these sites. This category on social media, a combination of the words "fitness" and "inspiration," is a health trend on social media in which users post fitness and nutrition related content, advice, and encouragement on social media (Tiggemann & Zoccaro, 2015; Raggatt et al., 2018). Additionally, it has been described as a movement intended to inspire users to lead a healthy, more fitness-oriented lifestyle (Abena, 2013; Turner & Lefevere, 2017). The overall tone of fitspiration is one that purportedly promotes exercise, strength, self-care, and empowerment. Users who follow this movement often refer to being part of a larger fitness culture, and report believing they promote healthy and accurate fitness and nutrition information on social media (Jong & Drummond, 2016).

Critics of fitspiration content on social media highlight the tendency of these images to promote thin and toned women, often in objectifying positions, and cite concerns that fitspiration posts can encourage users to push themselves too far during exercise and to focus on outcomes of body appearance rather than actual fitness and health (Tiggemann & Zoccaro, 2018). As such, similarities have been drawn between fitspiration content and photos of fashion models because of the potential to promote unrealistic beauty ideals in the name of health (Krane et al., 2001). The fitspiration movement has also been compared to the pro-anorexia (pro-ana) movement, including the #thinspiration category (i.e. combination of thin and inspiration), which primarily promotes disordered eating attitudes and behaviors (Low et al., 2003) and this content is also found on websites which promote eating disorders (Tiggemann & Zoccaro, 2018).

Thinspiration posts on social media are often paired with or contain messaging that encourages weight loss and glorifies unhealthily low body-fat (Louis & Arbuthnott, 2012). The primary difference found between thinspiration and fitspiration posts are that the latter are often less extreme than those from the thinspiration category (Alberga, Withnell, & van Ranson, 2018). More specifically, a content analysis of fitspiration images confirmed similarities between thinspiration and fitspiration content, but also revealed some differences between the two categories (Boepple & Thompson, 2016). Boepple and Thompson (2016) examined 100 images from websites promoting eating disorders. Their analysis revealed fitspiration images contained fewer messages of disordered eating than thinspiration posts, but suggests that fitspiration images are also concerning because of the potential impact they can have on women's body ideals. Therefore, fitspiration posts may be less overt in their messages promoting disordered eating, but include more subtle, disordered eating undertones which can impact women's cognitions and attitudes about their bodies.

This is further supported in a separate content analysis of 600 fitspiration images on social media specifically. Fitspiration posts were found to depict images that objectify women's bodies, and contain images of individuals with primarily low body fat (Tiggemann & Zaccardo, 2018). The researchers searched Instagram for the category #fitspiration, and compiled 600 images to be coded for three elements of fitspiration images: body shape displayed, activities portrayed, and any quotes or text included in the images. Results reveal the majority of people depicted in the images are women (67%), of which most were "thin" (75%). Moreover, 56% of the images evaluated portrayed objectified body parts (e.g. abdominals and midsections) both of men and women. Researchers found that women were more likely to be in a "sexy" pose (26%) as compared to men (10%; Tiggemann & Zaccardo, 2018). Finally, images or quotations were not seen in the majority of posts (18%). when present, most (58%) were deemed positive, but approximately 11% of the text was deemed to be potentially dysfunctional or encouraging extreme behaviors (ex: "falling is acceptable, puking is acceptable, crying is acceptable, blood is acceptable, pain is acceptable. Quitting is not.") Examples of health and fitness content from public social media accounts, with and without eating disordered undertones (i.e. fitspiration content) are seen below.

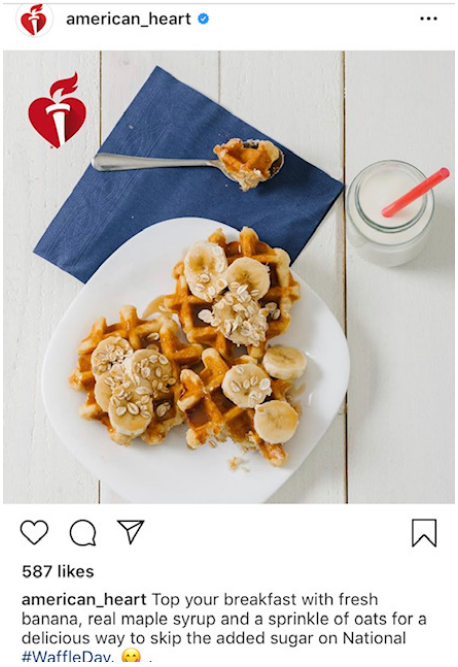

Image 1.

Example health and fitness social media image

Image 2.

Example fitspiration image from social media.

Because of the similarities between fitspiration and thinspiration content, it is argued that the fitspiration category on social media can potentially attract users with existing disordered eating cognitions, and/or other users with a more general unhealthy obsession with health and fitness, and that viewing this content can exacerbate unhealthy cognitions (Koven & Abry, 2015). This has been partially confirmed in one study which found that women who post fitspiration content were more likely to be at risk for a clinical eating disorder than a group of women who post travel images (Holland & Tiggemann, 2016). In sum, a direct relationship between fitspiration and disordered eating has been found in the literature. It is important to understand this when reviewing existing research on the impacts of health and fitness content on social media to ensure content with eating disorder undertones is not being used to represent all health and fitness content. When the effects of different types of health and fitness content are researched, differential outcomes are sometimes observed.

Health and Fitness Content, not Fitspiration, Impact on Well-being

As reviewed, viewing fitspiration content on social media, similar to eating disorder thinspiration content, has been found to have negative impacts on users eating cognitions. Another line of research has developed to look at the impacts of health and fitness content (i.e. health related fitness posts that do not encourage unhealthy methods of being healthy or have eating disorder undertones) more broadly, outside of fitspiration content, on user's well-being. While the results are mixed, taken in aggregate, they suggest positive outcomes are possible as a result of viewing health and fitness content. Unfortunately, there are some limitations in these studies, which are reviewed below.

One study utilizing undergraduate students attempted to examine the impacts of viewing fitness content posted by the participant's friends beyond fitspiration content (Arroyo & Brunner,

2016). Fitness content viewing was operationalized as the frequency with which participants reported observing the following content posted by friends: photos of healthy foods, photos of friends working out or at the gym, posts about "how they worked out or exercised" (p. 221), fitness inspiration quotations or images, before and after photos, and any workout metrics posted (ex: distance ran, calories burned). A series of hierarchal regression analyses revealed a relationship between viewing fitness posts and negative body talk, but that this relationship was moderated by social comparison tendencies even when controlling for body satisfaction, healthy eating and exercise behaviors, and frequency of social media use (Arroyo & Brunner, 2016). This study is an important contribution to the literature because it attempts to understand the effects of fitness and health content on social media beyond fitspiration content. Unfortunately because we do not know how frequently participant's friends posted content from a fitspiration category, we do not know how much of the outcomes observed can be attributed to health and fitness content or possibly to fitspiration content. Additionally, this study used moderation analyses to expand the understanding of the relationship between time viewing social media fitness content and negative outcomes which improves methodology beyond correlational analyses.

Results of looking at the outcomes of viewing health and fitness content more broadly (i.e. beyond fitspiration content) suggests that there is an inherent difference in the impacts of fitspiration-oriented content. For example, when experimentally manipulated, young women reported increased body dissatisfaction after viewing social media images portraying thin-ideal and athletic-ideal images, but not muscular ideal images (Robinson et al., 2017). This study utilized 106 female college undergraduate students who were randomly assigned to view one of three categories- thin ideal, athletic ideal, or muscular ideal before exercising. This study is

unique because it measures effects of exposure to different types of images on actual exercise behaviors. Researchers found that the athletic ideal and thin ideal image groups, and not muscular images, were associated with greater body dissatisfaction reported by participants. Moreover, the fitness images did not result in more vigorous exercise following exposure (Robinson et al., 2017). This study highlights that interacting with some types of health and fitness content on social media might impact body image cognitions differently, but they might not actually influence exercise behaviors.

Because of concerns over the impacts of fitspiration content, a body-positive movement has emerged on social media platforms. The body positive movement on social media is one that encourages individuals to denounce societal influences and judgments on physical appearance and beauty, and to reclaim one's own body confidence, self-esteem and positive view towards their body (Cwynar-Horta, 2016). To experimentally test the impacts of fitspiration images versus body-positive (i.e. self-compassionate) images, Slater, Varsani and Diedrichs (2017) randomly assigned 160 female undergraduate students to view images from either of these two categories, a combination category, or a fourth control category containing interior design images. Fitspiration content was comprised of images of women in workout clothing with thin and toned bodies, half of whom were actively working out in the images and half were posing in a more passive way. These images all were tagged with a fitspiration or fitspo hashtag. Self-compassionate images were also sourced from Instagram and were tagged with "self-love", "positive body image" or "self-compassion" and often contained inspirational quotes and did not contain any human body parts. The combination condition included 15 images of fitspiration and 5 images of self-compassion. These images all went through validation procedures by 30 women aged 18-25 (Slater, Varsani & Diedrichs, 2017). A series of moderated hierarchical multiple

regression analyses revealed that thin-ideal internalization moderated the differences between the combination group and control group such that individuals scoring higher on internalization of the thin ideal (measured using a subscale of the Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ3; Thompson et al., 2004) reported greater body satisfaction after viewing the self-compassion images than the control images. No differences were observed in the other two groups. Finally, the findings revealed that women viewing fitspiration and self-compassion images reported higher body satisfaction than those viewing fitspiration images, which was not influenced by thin-ideal internalization scores (Slater, Varsani & Diedrichs, 2017).

This study is an important contribution to the literature for multiple reasons. First, the authors outlined the ways in which images were compiled and validated to be used in a randomized control trial. Second, it reveals that, when using more rigorous research methodology and statistical analyses, the negative impacts of fitspiration content from social media is not as prevalent as seen in other studies. Unfortunately, this study samples from undergraduate students in the emerging adult age range, and does not add to our understanding of the impacts of exposure to health and fitness content on social media more broadly without the pro-eating disorder undertone that has been found in fitspiration content.

The findings reviewed above highlight differential outcomes are possible in response to engaging with fitspiration content as compared to health and wellness content without eating disorder undertones. While an important contribution, this limited body of work sheds light on limitations in the current literature. First, because fitspiration content has been used as a proxy for health and fitness content more broadly, there is, perhaps, an over emphasis in the literature on the negative outcomes of interacting with health and fitness content on social media. Currently no study exists comparing outcomes of engaging with fitness content with eating

disorder undertones to that which does not have disordered undertones. Consequently, we may not understand how health and fitness content that is not promoting disordered eating cognitions and behaviors is impacting social media users when taking into account previously identified risk factors for negative outcomes. This may potentially contribute to an explanation of the mixed outcomes of integrating health content into social media.

Social Media, Fitspiration and Body Image

A long history exists exploring the effects that the media, traditionally defined as television, movies, and print magazines, can have on body dissatisfaction and thin-ideal internalization (Grabe et al., 2008). An extensive line of research has established a relationship between body dissatisfaction in women, internalization of the thin ideal, and disordered eating behavior outcomes, with small to modest effects demonstrated in meta-analyses (Levine & Chapman, 2011; Grabe et al., 2008). Consequently, it is posited that disordered eating cognitions and behaviors (for example: internalization of the thin-idea (cognition) and exercise as a compensatory behavior or restricting food (behaviors) are likely the result of an interaction between media exposure and individual characteristics, not simply media exposure alone (Levine & Chapman, 2011). Moreover, it is thought that viewing body image content in traditional media outlets (ex: magazines, movies, etc.) is more a risk factor rather than a predictive factor for development of body image or eating disorders (Levine & Murnen, 2009). That is, individuals at risk for body image difficulties or eating disorders are more likely to view disordered body image content in the media in the first place.

As technology becomes more pervasive, the definition of media has been broadened to include online media and social media. (i.e. digital media). Social media offers some key differences from traditional media, which may actually create stronger negative impacts on

disordered eating cognitions and behaviors. First, they depict users themselves, real people, rather than supermodels. These people are also peers, which has been shown to have more severe impacts on body image (Carey, Donaghue, & Broderic, 2014). Second, the images and content posted onto social media can be edited, and an idealized version of the self can be portrayed (Zhao, Grasmuck, & Martin, 2008). Third, the interactive component of social media, often occurring in real time, has been proposed to strengthen negative impacts users can experience (Sharma & De Choudhurt, 2015). As such, a line of research examining the impacts of social media use on eating disordered cognitions has emerged.

In a review from 2016, Fardouly and Vartanian explored the impacts social media can have on body image; key findings are reviewed here. First, high school and pre-teenage Facebook users were found to have more drive for thinness, internalized thin ideal, and appearance comparisons than non-users. Second, more time on social media has been associated with disordered eating attitudes (body dissatisfaction, thin ideal internalization, drive for thinness) and behaviors (i.e. dieting). Third, increased usage of the photo feature on Facebook in particular has been attributed to increases in thin-ideal internalization, and greater weight dissatisfaction. This is similar to findings by Meier and Gray (2014) which indicate more interaction with images on social media, not greater social media use in general, was associated with greater weight dissatisfaction. Moreover, Fardouly & Vartanian (2016) concluded that social comparison behaviors mediated the relationship between social media use and disordered eating cognition outcomes (i.e. body image concerns and self-objectification and drive-for-thinness). Finally, the authors reviewed the, at the time limited, experimental literature. Themes that emerged include participants reporting negative outcomes (i.e. worse mood and poorer body image) after looking at pre-selected images of “attractive” individuals of the same sex, but this

was moderated by social comparison tendencies (Fardouly and Vartanian, 2016). Additionally, correlational relationships have been found between greater social media use and more negative self-talk (Arroyo & Brunner, 2016) and more negative body image (Fardouly et al, 2018). As such, the following factors have been identified to impact the relationship between social media use generally and negative eating cognition outcomes: drive for thinness, internalized thin ideal, social comparison behaviors (Fardouly & Vartanian, 2016), time on social media, and greater use of the photo features (Meier & Gray, 2014). Similar factors have emerged when looking at the impact of fitspiration content more specifically on social media users.

In sum, research has revealed social media use can influence disordered eating cognitions (e.g. body dissatisfaction, drive for thinness, and weight dissatisfaction) and behaviors (dieting). Moreover, it is not only spending time on social media that leads to these outcomes, but what a user is doing while they are on social media that impacts outcomes, including the types of health and fitness content that they are viewing. This is similar to findings in the psychological well-being literature (also reviewed above) suggesting intentionality on social media moderates negative outcomes. Risk factors identified to lead to greater body image problems specifically include greater engagement with the photo feature. Moreover, there have been differences found between social media users and non-users, which suggests that individual factors might increase the likelihood that people sign up for social media accounts in the first place. This is similar to the literature exploring who accesses eating disordered content in the media; people with more disordered eating cognitions and attitudes are more likely to access this content in the first place. Consequently, there is support for dispositional factors interacting with the ways in which social media is used to influence outcomes. These variables, or risk factors, from different, but related, literatures have not yet been combined into one study. The proposed dissertation study suggests

to combine previously identified risk factors about the ways in which social media are used (reviewed above: intentionality of use, time on the sites, photo usage features) with individual traits identified to influence negative body image outcomes following social media use (weight concerns, social comparison tendencies, thin ideal). The latter individual traits have also been identified as risk factors for development of clinical levels of eating disorders.

Disordered Eating Cognition and Behavior Risk Factors

Because the proposed study attempts to identify risk factors which may impact how users interact with health and fitness content on social media, and previous research suggests disordered eating cognition and behavior risk factors can influence how individuals respond to fitness content on social media (Tiggemann & Zaccaro, 2015), individual eating disorder risk factors, including gender, perceptions about weight and body image, and body mass index (BMI), are reviewed here.

Individuals identifying as female in gender are significantly more likely to be diagnosed with an eating disorder (American Psychiatric Association, 2013), and are more likely to exhibit sub-clinical levels of disordered eating attitudes and behaviors (Striegel-Moore et al., 2009). Gender differences in prevalence rates of eating disorders can be partially attributed to societal norms regarding physical appearance, internalization of these norms, and pressure to maintain a thin body (Hsu, 1989). It is suggested that of these psychological processes, internalization of the thin-ideal is especially harmful in terms of development of disordered eating cognitions and behaviors (Cafri, Yamamiya, Brannick, & Thompson, 2005) and has been identified as a causal factor in the development of eating disorders (Stice, 2002). Consequently, research attempting to understand the impacts of social media on body image should incorporate this well-known risk factor into research design.

Another cognitive process consistently identified as a key risk-factor for development of an eating disorder is having a distorted perception of one's body size, shape or weight (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). This distorted perception of body size and shape (i.e. body dissatisfaction) can be measured by calculating the discrepancy between an individual's reported ideal weight and actual weight using well-established image representations (Stunkard, Sorenson, & Schlusinger, 1983). This measure is called the Figure Rating Scale (Stunkard, Sorenson, & Schlusinger, 1983). It is posited that body dissatisfaction encapsulates multiple processes including shame, self-objectification, and overall dissatisfaction with one's body (Cash & Szymanski, 1995).

Relatedly, weight bias describes a negative judgment assigned to those of higher weight (Tomiyama, 2014). Individuals who hold a higher body mass index are more likely to internalize weight biases, and be at increased risk for body dissatisfaction and eating disorders. Therefore, a higher BMI is also considered a risk factor for development of disordered eating behaviors and cognitions through body dissatisfaction (Weinberger, Kersting, Riedel-Heller, & Luck-Sikorski, 2017). Interestingly, women portrayed in traditional media (i.e. television, movies and magazines) often have a BMI that is categorized as being unhealthy or similar to those in diagnostic criteria for anorexia (Wiseman, Gray, Mosimann, & Ahrens, 1992). BMI is calculated using an individual's height squared and weight. While it is an imperfect instrument because it does not account for the weight of muscle being heavier than the weight of fat, it is often used to categorize individuals into different weight categories. For example, a BMI of 18.5-24.9 is considered "normal" and greater than 30 is labeled "obese" (Centers for Disease Control and Prevention, 2017).

In sum, the following risk factors have been identified from the eating disorder literature: (1) gender; (2) thin-ideal internalization and (3) weight-bias internalization. Because BMI is a risk factor for body dissatisfaction, and body dissatisfaction is thought to encapsulate multiple processes including shame, self-objectification, and overall dissatisfaction with one's body, body dissatisfaction is going to be used as an outcome measure in this study rather than a predictive variable.

Theoretical Considerations

With the rapid rise of technology including smartphone and social media use, an increased exploration of how and why these tools are used in health contexts has emerged. While much of this research is geared towards health behavior change applications and interventions delivered on smartphones, theoretical underpinnings of engaging in health content on social media has also been explored briefly. For example, theorists of media influence draw from Theory of Planned Behavior such that viewing images promoting unhealthy thin-ideal content influences users' attitudes, norms and beliefs about body size (Ghaznavi & Taylor, 2015). Because Social Cognitive theory states that learning is a process of observing others' actions and the outcomes (including consequences) of those actions (Bandura, 2001), it is posited that fitspiration content can act as a model from which a user viewing this content can imitate behaviors, and can potentially be socially rewarded for this imitation (Ghaznavi & Taylor, 2015). Individuals can learn rules of society, and their peers, around thin ideals, body size, and exercise attitudes on social media. Because social cognitive theory also states that outcome expectancies can influence motivation for behavior (Bandura, 2001), seeing thin but toned images on social media paired with captions to "never quit" can lead users to believe thin and toned outcomes are possible through working out hard and eating healthy.

The last relevant, but particularly salient, aspect of social cognitive theory enacted through social media is the social reward for behavior (Bandura, 2001). Because social media currently totals the number of "likes" and comments a post receives, it is very easy for a user to quantify how much social reward is given to different behaviors. This is seen in a study comparing how many "likes" different types of images receive on social media which found that healthy food photos get more likes and positive feedback than photos of unhealth food on social media (Sharma & De Choudhury, 2015). While the current study is not specifically testing all of the principles of social cognitive theory, the proposed model has been informed by the components reviewed above. Because social media can be argued to be a platform that allows for observing other's actions and behaviors, the platform in and of itself allows for social cognitive theory to explain some results on user's behaviors. If a user spends much time looking at and interacting with content that endorses unhealthy body image ideals, through social cognitive theory that user's own behaviors are likely to be more similar to other's posting the content on Instagram.

Summary

After reviewing the information presented above, a few themes have emerged. First, concern has been raised over the potential negative impacts of social media use, which has been confirmed by correlational and linear regression analyses linking time spent on the sites and negative impacts on well-being (Arroyo & Brunner, 2016; Kalpidou, Costin & Morris, 2011; Sagioglou & Greitmeyer, 2014). Upon further investigation, it appears as though additional factors mediate and/or moderate these associations such as the ways in which social media is used, specifically (1) intentionality of social media use and (2) proportion of time spent engaging with photos on social media.

Second, research exploring the impacts of social media use on eating cognitions and attitudes, measured using exercise attitude and body image and self-esteem scales, has identified factors that impact the relationship between social media use and body-image outcomes specifically. These include internalization of the thin-ideal (Weinberger, Kersting, Riedel-Heller, & Luck-Sikorski 2017; Cafri, Yamamiya, Brannick, & Thompson, 2005), and social comparison behaviors (Fardouly et al., 2017; Fardouly and Vartanian, 2016; Lup, Trub & Rosenthal, 2015). Moreover, research that experimentally assigns participants to conditions and controls the content to which participants are exposed reveals health and fitness content does not universally produce negative outcomes (Robinson et al., 2017). Rather, content that contains eating disordered undertones (i.e. fitspiration) is more likely to produce negative, including body-positive content (Slater, Varsani, & Diedrichs, 2017) and content depicting images of muscular individuals (Robinson et al., 2017). Because people who have eating disorder risk factors are more likely to engage with fitspiration content in the first place (Koven & Arby, 2015 Holland & Tiggemann, 2016), it is currently unclear whether these risk factors might over-estimate the negative impacts of viewing fitness content on social media. In other words, we currently do not know how much of the relationship between social media use and negative body image is being influenced by individuals who are pre-disposed to have disordered eating cognitions and behaviors, or clinical eating disorders.

Third, most of the current literature utilizes emerging adults as their sample participants. These individuals use social media differently and have different impacts because of social media use as compared to older cohorts (Hayes, van Stolk-Cooke & Muench, 2015). Because the current literature primarily utilizes younger individuals, we are only able to see a small glimpse of the potential impacts (positive and negative) of engaging health and fitness content on social

media. It will be important to expand our variability in outcomes of social media use to fully understand who may be experiencing positive or negative consequences of use. Having a wider variation of age in users for this study can help to expand the number of individuals experiencing negative impacts from social media use so we can better identify the individuals who are having negative outcomes.

The study described below has three aims in an attempt to address the identified gaps in the literature. First, it attempts to understand social media users' motives for viewing health and fitness content on social media using qualitative data analysis. Second, it attempts to understand if the impacts of viewing health and fitness content without eating disorder undertones are different from viewing health and fitness content with eating disorder undertones (i.e. fitspiration content). The proposed study will use random assignment to one of three conditions (the third being a neutral control condition) to answer this question. Finally, combining literature reviewed above, the proposed study attempts to understand who might be at risk for experiencing negative outcomes following engaging with health and fitness content from social media. To do so, a model is proposed based on previous work which identified maladaptive uses of social media (increased time on the sites, low intentionality, and high photo usage) to predict body-image related distress (poor exercise attitudes, lower self-esteem, greater body dissatisfaction, and negative body image). It is hypothesized that this relationship will be moderated by variables previously identified in the literature to be risk factors for eating disorders (weight bias internalization, thin ideal internalization and BMI) and social comparison behaviors.

The study will incorporate empirical and theoretical knowledge to experimentally manipulate and statistically model the negative effects of viewing health and fitness content on social media. Participants of the current study will complete a battery of measures, and will be

exposed to one of three experimental conditions. The first condition will include images compiled from Instagram and pilot-tested by an independent sample of participants depicting health and fitness content without eating disordered undertones. These publicly available images will be compiled from reputable organization's social media accounts (ex: American Heart Association) and, thus, likely are depicting more accurate and reliable information about health.

Participants in the second condition, the fitspiration condition, will be exposed to images compiled from Instagram labeled with the #fitspiration category. The fitspiration condition is employed to help determine whether images that have disordered eating undertones are inherently different in terms of impacts on users than reliable health information. These images will also be from publicly available social media users' profiles, and pilot tested to ensure they contain disordered-eating undertones. The third group, the control group, will be exposed to travel images also compiled from Instagram and pilot-tested by an independent sample. Travel images have been selected as a control condition based on previous literature (Tiggemann & Zaccaro, 2015). Importantly, travel images will not include any content depicting human beings or food; rather, these images will focus on nature and landscapes. The assessment battery is compiled of measures previously used to study both risk factors for, and outcomes of, social media use. This dissertation attempts to answer the exploratory question of for whom is health and fitness content on social media creating negative outcomes? The following hypothesis are predicted by the researcher, and the entire model can be viewed in Figure 1:

Hypothesis 1 (H1): Participants who are randomly assigned to view fitspiration content from social media will exhibit more lower scores on outcome measures (e.g. self-esteem, body-esteem, exercise attitudes, body dissatisfaction) after viewing the experimental images than those who are assigned to view health and fitness content without eating disordered undertones.

Participants in the control condition should exhibit the lowest level of distress following the experimental portion of the study.

Hypothesis 2 (H2): Greater maladaptive social media use will predict more body-image related distress (i.e. distress). Maladaptive social media use will be a latent variable comprised of the amount of time on social media, the proportion of time spent using photo features, and intentionality of social media use. Body-image related distress will be a latent variable comprised of exercise attitudes, body dissatisfaction, self-esteem and body-esteem measures.

Hypothesis 3 (H3) predicts that risk factors for disordered eating attitudes and behaviors (i.e. disordered eating risk factors) will moderate the relationship between social media use and body-image related distress outcomes, such that those with higher disordered eating risk factors will exhibit more distress. Disordered eating risk factors identified above will be measured, including internalization of thin ideal, weight bias, and BMI. Additionally, because social comparison behaviors have been theoretically linked to negative body image outcomes, and have been shown to moderate the relationship between social media use and multiple measures of distress, social comparison behaviors will also be included in this moderation analysis.

CHAPTER 3: METHODOLOGY

Overview

The current study utilized an experimental design in which research volunteers were exposed to one of three conditions: health and fitness content from social media without disordered eating undertones; fitspiration content (containing disordered eating undertones); or travel images, which functioned as a control condition. Participants completed measures of eating disorder risk factors, and social media use habits prior to being exposed to the experimental stimuli; after exposure, they completed body image distress outcome measures. Participants also completed a manipulation check to ensure they viewed and attended to the experimental stimuli. All images were reviewed by an independent sample in a pilot study to ensure (1) there were significant perceived differences between the two experimental conditions on the degree to which the images contained elements of disordered-eating undertones, and (2) the control images did not depict health and fitness content. Please see below for more information on pilot-testing. All survey procedures were completed online. Structural equation modeling (SEM) and ANOVAs were used to test the hypotheses listed above. The hypothesized model is seen in Figure 1.

Procedure

Image Selection and Pilot-Testing. A total of 90 images depicting fitspiration, health and wellness, and nature landscapes were compiled from publicly available accounts on the social media platform Instagram. The researcher and three undergraduate assistants used a series of hashtag searches to find images for the study. The three conditions were operationalized for the undergraduate assistants using the definitions and example images detailed above, and each

undergraduate assistant identified 10 images for each condition, for a total of 30 images per condition.

To select images for the fitspiration condition, the following hashtag searches were used: #fitspiration, #fitspo, #fitnesslife, #fitnessgirl, #fitnessmotivation. Images for the control condition were found using the following hashtags: #nature, #sunset, #travel, #travelphotography, #travelnature and #nationalparks. Images for the health condition were selected to depict individuals from a variety of races, ages, and body sizes engaging in fitness and health-related activities or food images. The following hashtag searches were used to find health images: #healthy, #healthy, #wellness, # womenshealth, #healthandwellness, #healthylifestyle, #healthylife, and #healthyeating.

The ninety total images depicting each of the three conditions were reviewed by the researcher. Utilizing the definitions for each proposed condition, and with intentionality towards diversity in race, age and body size, the researcher accepted all images found by the undergraduate research coordinators to be used in the pilot study. Multiple demographic representations were included during image selection in an attempt to present a more diverse and relatable compilation of images.

Participants were recruited from Mturk and by word of mouth via social media to complete the pilot study. Individuals who participated in the pilot study were not allowed access to the experimental portion of the study: this restriction was preprogrammed in the survey hosting platform. All pilot participants met the same eligibility criteria as the experimental sample, including being female in gender, no history of an eating disorder, and not currently pregnant. Participants were asked to rate all 90 images on the degree to which they represent

each condition, and to provide demographic information to be used to both understand participant characteristics and determine eligibility.

The following procedures were employed to evaluate the degree to which each photo aligned with each proposed construct (i.e. condition). Participants viewed one image at a time and were asked to rate each one on the two constructs detailed: health and fitness, and fitspiration. First, participants were provided with the following definition of health and wellness: "health is not merely the absence of illness but a state of complete physical, mental, and social wellbeing" (WHO, 1995; Sartiorius, 2006) and fitness: "a set of attributes that people have or achieve that relates to the ability to perform physical activity" (Wilder et al., 2006). Participants were then asked to rate each image on the degree to which it represented health and/or fitness on a scale of 1 *strongly disagree* to 5 *strongly agree*. The following definition of fitspiration was provided: "inspirational fitness content which promotes thin and toned women, often in objectifying positions, and might encourage users to push themselves too far during exercise or focus on outcomes of body appearance rather than actual fitness and health". Participants were then instructed to rate each image on the degree to which they believed the photo endorsed fitspiration from 1 *strongly disagree* to 5 *strongly agree*. Because previous literature suggests that people who follow fitspiration accounts on social media do not perceive the category to be negative or problematic (Jong & Drummond, 2016), participants were explicitly told to rate the photos despite their personal agreement with or attitudes towards fitspiration content. Finally, participants were asked the likelihood with which they think they might view the image if searching for health-related content on social media from 1 *not at* all to 5 *very likely.* These pilot-testing procedures were employed by Slater et al. (2017) in a study comparing fitspiration images and self-compassion images.

Qualtrics was used to anonymously collect pilot data, and SPSS and Microsoft Excel were used to analyze this dataset.

Experimental Study. Participants for the experimental portion of the study were recruited via Amazon's Mechanical Turk (Mturk) and through posts on social media platforms. Social media posts were made using IRB approved language asking volunteers to participate in a study exploring health and fitness content on social media. Posts were made in closed and open Facebook groups of which the PI was a member, and posts were made to the status of colleagues of the PI to help target a wide geographical audience.

MTurk is an online crowdsourcing platform where workers, or individuals over the age of 18 who would like to complete surveys for payment, or Human Intelligence Tasks (HITs), can be reached by researchers seeking individuals to provide data. Eligible participants identified as female in gender, were not pregnant at time of survey completion, and reported a history negative for diagnosis or treatment of an eating disorder. MTurk workers recruited for this study were located in the United States, could speak English fluently, and had a HIT approval rating of 95% or above with more than 100 completed HITs. These criteria are commonly used to define a "high quality" (i.e. reliable) MTurk worker (Johnson & Borden, 2012). An approval rating is one assigned by MTurk and is calculated based on the percentage of HITs workers have completed in the past deemed reliable by other researchers. For example, to earn a 95% approval rating a worker who completed 20 surveys would have had a minimum of 19 surveys accepted by the researcher (Johnson & Borden, 2012). All of these parameters were pre-programmed in Mturk before the surveys were accessible to MTurk workers.

The online format of the survey allowed participants to complete it at a time that was convenient for them. MTurk was used to recruit participants in the adult age category (21-65+) to

complete the survey. This age range includes emerging adults in addition to those outside of emerging adulthood, which is a population that is currently under-studied in the social media literature. Because statistical analyses reveal that MTurk workers are roughly 10 years older, on average, than an undergraduate research pool sample (Johnson & Borden, 2012) this recruitment method provided access to the target population, in addition to those in emerging adulthood. MTurk workers have also been found to be more socio-economically and racially diverse than traditional university research pool samples, and samples recruited through social media (Casler, Bickel, & Hackett, 2013).

In a meta-analysis comparing MTurk workers to other recruitment sources for medical and health related research, MTurk workers were found to provide data that is reliable and comparable to those collected using more traditional recruitment methods (Mortensen & Hughes, 2018). One study examining quality of MTurk data compared to a university campus sample, not related to health, found the MTurk workers to be more attentive as compared to the campus sample, as measured by number of failed attention checks (Hauser & Schwartz, 2016). Although research suggests MTurk workers produce good quality data when certain parameters are present (i.e. a HIT approval rating of 95%).

The experimental portion of the study was advertised to MTurk workers as a HIT that examines social media use in relation to health and wellness. Eligibility criteria were included in the introductory advertisement (i.e. social media users, female in gender, not currently pregnant, and no history of diagnosed eating disorder). After opening the HIT, participants were directed to an external Qualtrics survey. First, they were presented with an eligibility questionnaire to ensure they were eligible to be enrolled into the study. Ineligible participants were routed to the end of the survey and not permitted to enter, whereas eligible participants were presented with an

informed consent page. This page explained the study's purpose, procedures, potential risks and benefits, compensation, and contact information for the researchers and University Institutional Review Board (IRB). Participants were required to agree or disagree to providing consent before they continued to the data collection portion of the survey.

Eligible participants who agreed to participate in the study were asked to complete measures assessing social media use habits and motives for engaging with health and fitness content on social media. Then, measures of social comparison tendencies, thin ideal internalization and weight bias internalization were presented. Following completion of these measures, participants were randomized in Qualtrics to be exposed to a block of photos depicting one of the three study conditions outlined previously. This is a feature that was pre-programed into the Qualtrics survey design. During this portion, participants were presented with images from the assigned condition, and asked to evaluate each one in a manner similar to that described by Tiggeman and Zaccardo (2015). Participants first rated the quality of each photograph on a scale of 1 *very poor quality* to 5 *very good quality*. Additionally, participants were asked to evaluate how much each image depicts health or fitness related content from 1 *not at all* to 4 *completely*. This evaluation task is included to ensure participants were spending adequate time viewing the images. After reviewing the images, participants were presented with measures representing body image distress in the model. These measures include scales of body-esteem, self-esteem, exercise attitudes, and body distress. See Figure 2 for study flow, specifically the order in which key study variables were completed, and time at which participants viewed experimental images in relation to each measure's completion.

Upon completion of the questionnaire in its entirety, participants were thanked for their participation and referrals to mental health support websites were provided. Participants recruited

from social media were then able to enter into a random drawing hosted by the researcher. To do so they clicked on a link to an external platform. Google Docs was used to capture participant's drawing entry information, either their email addresses or other preferred method of contact, to be used if they won the random drawing. This information was not connected with their survey responses.

Mturk workers were able to enter a code of their choice into the end of the survey, and were instructed to enter the same code into their Mturk portal as a way to anonymously connect their survey responses with the Mturk portal. The researcher reviewed the Mturk responses within one week of survey completion (as pre-determined by Amazon's Mturk rules). If participants were eligible to participate, it appeared they completed most of the questionnaire and their completion code in the survey matched the one they provided to Mturk, their work was accepted and Mturk workers were compensated. Work that was deemed inadequate was rejected, the worker was not compensated, and their data were not included in analyses.

Mturk participants were compensated $1 to complete the survey, which is in line with recommended payment for the platform. Participants recruited via word of mouth were able to enroll into a random drawing for one of 5 $10 Target gift cards after completion of the questionnaire. All study procedures were approved by the IRB at the University of North Carolina at Charlotte. Recruitment occurred from Spring of 2020 through Winter of 2021.

Participants

A total of one thousand and five individuals inquired about participating in the survey: eight hundred and eighty-four of these individuals were Mturk workers, and one hundred and twenty-one were recruited from social media. Four hundred and eighty-three (54.63%) of the Mturk workers who inquired to participate were not eligible, as determined by the pre-screen

eligibility form. Reasons include being assigned male at birth (n= 358) or identifying as male in gender (n=24), being currently pregnant (n=92), or having a history of an eating disorder (n= 42). Some participants were ineligible for multiple reasons, for example being currently pregnant and having a history of an eating disorder.

Four hundred and four individuals were interested in participating in the experimental portion of the study and met eligibility criteria. Of these, three did not agree to consent and were therefore not enrolled into the study. Additionally, participants who were deemed unreliable or incomplete responders, either because they completed less than 99% of the survey (n=135) or because they provided poor quality data (n=71), were removed from analyses. Consequently, the total number of participants included in these analyses is two hundred and twenty-two (N=222). While most participants who were ineligible or removed from analyses were recruited through Mturk, there were no significant demographic differences for these individuals compared to the enrolled participants, other than already described (i.e. those who had a sex or gender identification of male). Of the total number of participants, one-hundred and sixty-three participants were recruited via MTurk, and the remaining fifty-nine were recruited through social media.

Participants were randomly assigned to a condition by Qualtrics. A total of 72 participants were assigned to the health condition, 75 to the fitspiration condition, and 75 to the control condition. There were no significant differences on many demographic variables by condition. However, age was significantly different with the control condition having the youngest average age (M=34.18, SD= 9.67), health having a mean age of 37.40 (SD=11.34) and the fitspiration condition having the highest mean age of 38.61 (SD = 11.31).

Demographic Characteristics. Because of eligibility requirements, all participants in the current study identified as female in gender and were assigned female sex at birth. The mean age of the sample is 36.7 (SD = 11.31), and ranges from twenty-one years through seventy-two years old. Participants were predominantly white (75.2%, n= 167), however roughly twelve percent identified as black (11.3% n= 25), and a smaller number of individuals identified as Asian (8.6%, n= 19) or Latinx (2.7%, n=6). Most participants (95%) in the experimental sample reported some college education or higher, whereas nine participants indicated less than some college education (4.6%). Most participants held either a bachelor's degree (56.7%, n= 126) or a graduate school degree (29.8%, n= 66). More than half (57.7%) of participants reported an annual household income of above $50,000, while nearly nineteen percent (18.5%, n= 41) reported a household income of $100,000 per year or above. Participants were not asked to report the number of individuals per household; however, most reported their marital status to be married or in a civil union or domestic partnership (62.3%, n=142) and only 14.5% (n=33) identified as single. For a full breakdown of demographic characteristics of the experimental sample, see table 2.

Measures

Eligibility. Demographic information, including eligibility criteria, was ascertained by asking participants to select their gender, sex assigned at birth, age, and race. Additionally, participants reported their height in feet/inches and weight in pounds (to be used by the researcher to calculate BMI). Two questions were used to ask if a participant was currently pregnant, or had ever received diagnosis of or treatment for (including current) an eating disorder, to which they could reply yes or no.

Qualitative Data. A series of open-ended questions were included asking participants (1) their primary motives for using a social media platform, (2) their primary motives for accessing

health and fitness content on social media, or for following these types of accounts, and (3) how they perceive that they can be impacted by being exposed to health and fitness content on social media. Participants had the option to indicate they do not believe they access health or fitness information on social media.

Internet and Social Networking Use. A series of previously established measures were administered to better understand internet and social networking habits of participants in addition to the qualitative questions detailed above. The Facebook Activity Scale (FAS; Yang & Brown, 2013) was used to better understand the motives for social networking use. Participants were asked to rate how frequently they use a variety of social networking sites, not only Facebook, for a variety of reasons on a 5-point scale where 0 indicated "never", 1 indicated "sometimes", 2 indicated "about half the time", 3 indicated "most of the time" and 4 indicated "a lot". An example item is "How frequently do you use social networking sites…for the following reasons? Connect with someone I've met since college." Additionally, questions from the Descriptive Measures about Social Media Use (Boyd & Hargittai, 2010) scale were included to understand the frequency of various social networking apps.

Maladaptive Social Media Use. The latent variable maladaptive social media use is comprised of the total time spent on social media platforms per day, proportion of that time spent engaging with photo content, and intentionality of the participant's social media use. A series of face-valid questions were administered to capture how participants use social media. These are detailed below. Measures comprising maladaptive social media use were completed before exposure to the experimental manipulation.

Time per day. One face-valid question was asked to determine the approximate amount of time per day a participant spent on social media sites. Response options ranged from 0 = *never*

to 4 = *always*. Higher scores on this measure represent more time spent on social media each day.

Photo usage. The amount of time participants spend engaging with photo content while on social media was captured by asking participants "Of the total amount of time you spend on social media per day, how much of that time is spent looking at your own or other's photos?". Participants were asked to report their answer as a percentage, and were given the example "if you ONLY have an Instagram account, and only use that account to look at photos of yourself and others, you would indicate '100%'" Higher scores on this measure indicate more time spent engaging with photo content while on social media.

Intentionality. Intentionality of social media use was assessed using two face-valid questions asking participants to report, on a scale of 0 = *never* to 4 = *always* (1) how often they find themselves mindlessly scrolling their social media feeds, (2) and "How often do you find yourself using social media longer than you intended to?" These questions were generated by the researcher based on previous literature exploring social media use (Sagioglou & Greitmeyer, 2014). Higher summed scores on these two items indicate less intentional social media use and range of possible scores is 0-8. The alpha of intentionality of social media use in this study is α =.68.

Disordered Eating Risk Factors. The latent variable eating disordered risk factors is comprised of BMI (calculated by the researcher), social comparison behaviors, weight bias internalization, and internalized thin ideal. While being overweight has been shown in previous studies to be a risk factor for development and maintenance of eating disorders (Haines & Neumark-Sztainer, 2006), as reviewed above, further investigation has revealed that attributing

higher importance to body shape and size with a higher BMI has been shown to be a more comprehensive risk factor for eating disorders (Pearl & Puhl, 2014).

BMI. To capture BMI, participants were asked to report their current weight in pounds and height in inches. Weight in pounds was converted by the researcher into kilograms, and height in inches into meters. Then, each participant's BMI was calculated using the standard formula of BMI=kg/m^2. BMI was used as a continuous variable in analyses. BMI descriptors have been established in the medical field, and include: underweight (< 18 kg/m^2) healthy weight (18·5- < 25 kg/m^2), overweight (25- < 30 kg/m^2), class I obesity (30- < 35 kg/m^2), class II obesity (35- < 40 kg/m^2), and class III obesity (≥40 kg/m^2; CDC, 2021, April 28).

Social comparisons. To assess the degree to which participants engage in social comparisons to others, the scale of Social Comparison Orientation (SSCO) was administered (Gibbons & Buunk, 1999). This scale contains 11 items and examines comparing tendencies of participants using a 5 point likert scale of 1= *disagree strongly* to 5 = *agree strongly*, with two items that were reverse coded. An example item of this scale is: "I always pay a lot of attention to how I do things compared with how others do things." Possible scores range from 0-44, and higher summed scores indicate a participant is more likely to engage in social comparison behaviors. The alpha of the SSCO in the current study is α= .79.

Weight bias internalization. Participants completed the 11-item Weight Bias Internalization Scale- Modified (WBIS-M; Pearl & Puhl, 2014) to assess internalized attitudes about body shape and weight. This is the most commonly used scale to assess for weight bias internalization, or the degree to which an individual has internalized negative beliefs and stereotypes about being overweight (Durso & Latner, 2008). The measure was developed out of

concern over lack of generalizability of other weight bias measures to individuals who are over-weight.

One example item on the WBIS-M is "I am less attractive than most other people because of my weight.". Two items were reverse coded, for example "Because of my weight, I feel that I am just as competent as anyone." Participants responded on a 7-point likert scale (1 *strongly agree*, 7 *strongly disagree),* with higher summed scores indicating greater weight bias internalization. Possible scores range from 11-77. The scale has demonstrated good psychometric properties with a variety of samples, including with female community samples (Hilbert et al., 2014), overweight/obese samples (Lee & Dedrick, 2016) and in a sample recruited from Mturk (Pearl & Puhl, 2014). The alpha of the WBIS-M in the current study is α= .91.

Internalized thin-ideal. The degree to which participants have internalized a thin-ideal was assessed using the general subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3; Thompson et al., 2004). This third iteration of the measure contains multiple subscales, one of which is used to assess general internalization of the thin-ideal and is comprised of 9 items, three of which are reverse coded. Participants were asked to respond on a scale from 1 *definitely disagree* to 5 *definitely agree* on the degree to which they agree with a series of statements. Two examples of these statements are: "I would like my body to look like the models who appear in magazines" and "I would like my body to look like the people who are in movies." Possible scores range from 9 through 45. Higher scores on this scale indicate greater thin-ideal internalization. The alpha of the general subscale of the SATAQ-3 in the current study is α= .85.

Body Image Distress. The latent variable body image distress is comprised of body distress, exercise attitudes, self-esteem, and body-image. These measures were completed after exposure to social media images.

Body Distress. Body image disturbance (i.e. body distress) was assessed using the Figure Rating Scale (Stunkard, Sorenson, & Schlusinger, 1983). This widely recognized tool presents nine schematic figures of varying size from very thin to morbidly obese and asks the respondent to indicate which image most represents their current body size and their ideal body size (Stunkard, Sorenson, & Schlusinger, 1983). A score of distress was calculated representing the difference between the two. Greater discrepancy between ideal and actual body size, i.e. higher scores, represents greater body dissatisfaction. Negative scores on this measure represent participants indicating their current body size is smaller than their ideal body size. Scores on this measure can range from -8 through 8. Because the current study only sampled female participants, only the female body images were presented.

Exercise Attitudes. Attitudes and beliefs surrounding exercise was assessed using the Obligatory Exercise Questionnaire (OEQ; Pasman & Thompson, 1988). This is a 20-item scale which contains 2 reverse coded items and was adapted from Blumenthal et al.'s 1985 Obligatory Running Questionnaire. Participants were asked how often they engage in specific exercise habits on a 4-point likert scale from 1 *Never* to 4 *Always*. Sample items include "When I don't exercise I feel guilty" and "If I feel I have overeaten, I will try to make up for it by increasing the amount I exercise". Higher summed scores of the Obligatory Exercise Questionnaire represent more disordered exercise attitudes, and possible scores range from 20-80. The alpha of the OEQ in the current study is $\alpha = .88$.

Self-Esteem. The Rosenberg Self-Esteem Scale (RSES) was used to measure participants self-esteem (Rosenberg, 1965). This measure consists of 10 items scored on a 4-point scale anchored by *strongly disagree* and *strongly agree.* Five items were reverse coded. Higher scores indicate higher self-esteem, and possible scores range from 4-40. This scale is widely used to measure self-esteem and demonstrates consistently good psychometric properties both on a trait and state level (Heine et al., 2008) including in a lab setting after a manipulation of Facebook use (Gonzales & Hancock, 2011). The alpha of the RSES in the current study is α=.82.

Body Esteem. Body esteem was measured using the 16-item short form of the Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987; Evans & Dolan, 1993). This questionnaire was adapted from a 36-item version of the same questionnaire, both of which assess affective reactions towards the body. The scales do so by asking how often an individual has experienced a series of negative experiences because of their body over the last 4 weeks from 1 *never* to 6 *always*. An example item is: "have you been afraid that you might become fat (or fatter)?" Responses are summed, and cutoff scores have been suggested indicating no concern with shape through marked concern with shape (Evans & Dolan, 1993). Possible scores range from 16-96. The alpha of the BSQ in the current study is α= .94.

Plan of Analysis

Manipulation Check. The results of the image evaluation task were analyzed to determine if participants in the health and fitness condition and fitspiration condition rated their images as more strongly depicting health content than the control group. The scores from each photo were summed to create a total score, and the means were then be compared across conditions. The additional manipulation check of asking participants to identify the category with which their condition's images aligns was also evaluated.

Qualitative Data Analysis. To understand user's motives for using and perceived outcomes of health and fitness content on social media, the open-ended questions were analyzed using inductive thematic analysis procedures. This type of analysis is commonly used for qualitative data. It incorporates reviewing the qualitative data, identifying themes from the data itself (Braun & Clarke, 2006), and independent coders to code the data. The primary investigator and the faculty advisor both coded qualitative responses based on the thematic coding scheme identified by the primary investigator, and interrater reliabilities were calculated.

Model Check. Because there is no universally agreed upon way to assess goodness of fit in SEM (Kline, 2016), a series of tests were run to assess the fit of the proposed model. Since different analyses test the fit of a model in different ways, a holistic approach recommended by Kline (2016) to evaluate fit was employed. The fit statistics include: Chi square analyses, Steiger-Lind Root Mean Square Error of Approximation (RMSEA), comparative fit index (CFI), and Standardized Root Mean Square Residual (SRMR). Additionally, confirmatory factor analyses were conducted to determine if the observed variables load on to each respective latent variable. An exploratory factor analysis (EFA) was conducted to better understand factor loadings of all study variables in the model.

Hypothesis testing. The goal of the current study was to understand how engaging with health and fitness content on social media might impact social media users. This included three individual aims: (1) to understand social media users' motives for viewing health and fitness content on social media; (2) to explore if the effects of viewing Health & Fitness content are different from fitspiration content; and (3) to identify who is at risk for experiencing negative outcomes following engagement with health and fitness content from social media.

First, correlation analyses were performed to understand the relationship between demographic variables and study variables. At the same time, a series of checks were performed to reveal any demographic differences between study variables or by condition. Then, ANOVAs were used to determine whether there are differences in the outcome variables between conditions (H1), and ANCOVAs were used to control for significant differences in demographic characteristics when appropriate. Next, the proposed model was tested, including H2 and H3. This was done using latent structures structural equations modeling (SEM) in IBM SPSS AMOS. Latent structures modeling allows for the formal modeling of measurement error, and allows for the incorporation of missing data (Kline, 2016). If the proposed model is not a good fit for the data, the researcher planned to use alternative statistical modeling techniques allowing the data to create a different model identifying factors leading to distressing outcomes. Finally, post-hoc analyses were performed to determine potential source of null findings. The data analytic software programs of SPSS and AMOS were used to complete all analyses.

CHAPTER 4: RESULTS

Pilot Study

Sample. Sixty-six individuals signed up on MTurk to complete the pilot study portion of the research project. Twenty-seven of these individuals did not complete the demographic portion of the survey, and therefore their eligibility could not be determined. Of those who completed this section, nine identified a sex or gender other than female, four reported a history of treatment for an eating disorder, and one was currently pregnant. As such, twenty-five participants were eligible for the study. One was removed from analyses for acquiescent responding. Therefore, data from twenty-four individuals were used to select images for the experimental portion of the study. Nineteen of these individuals were recruited from Mturk and five from convenience sampling, (i.e. graduate students unfamiliar with the project who volunteered to participate). Most of these individuals identified as white or European American (n=21) and had a mean age of 33.56 years old (SD=6.74). Ninety-six percent of the sample reported completing at least some college education.

Control Images. As noted above, pilot study participants viewed the 90 images that had been chosen by the researcher and they rated the extent to which each one fit the definitions for health and fitness, and fitspiration. Of the 30 control images presented, fourteen images were identified as not representing either fitspiration or health content to any degree by any participants. An additional nine images had only one participant rate them as representing either health or fitspiration content to some degree. All of these images were originally selected to be included in the pilot study by the researcher to be used in the control condition.

Fitspiration Images. Of all ninety images presented in the pilot study, 75% of the sample strongly agreed that nine images aligned with the description provided of fitspiration

content. Another ten images were deemed to strongly align with the fitspiration condition by 60 to 71% of the sample. All nineteen of these images were originally selected to be representative of fitspiration content by the researcher.

Health Images. Fewer participants strongly agreed that a large number of health images strongly aligned with the definition of health provided by the researcher (2 images had this agreement at a 71% level). Roughly sixty-three percent (62.5%) of participants reported that four total images strongly represented the definition of health, and more than half but less than 61% (i.e. 51%-60%) of participants indicated that 8 additional images strongly aligned with the definition of health. Four images were endorsed by half (50%) of the sample to strongly represent health content. All sixteen of these images were intended to be representative of health content by the researcher when the images were selected. Three additional images with slightly lower ratings were selected to be included in the health condition for the final study. They were rated as strongly aligning with the definition of health by more than 40% of the sample, but not a majority of the sample. The decision was made to include these specific images to diversify the size, race and age of the individuals pictured in the health images for the experimental portion of the study.

To see the ratings for each of the 90 images piloted, see table 1. To see all of the images included in each condition of the experimental study, see Figures 3-5. No strict cutoffs were used when evaluating the results of image pilot testing to include or exclude an image. Rather, the researcher weighed the results of each image's ratings against the actual content of the image and demographic diversity of the individual presented if there was a human in the photo. While there were not strict cutoffs, images were not included in the current study for any condition if pilot

results revealed that images strongly represented both health and fitspiration in one image, to a strong degree.

Experimental Study

Study Variables and Demographics. To better understand how demographic variables might be related to key study variables, a series of analyses were conducted. First, Pearson's Correlation Coefficients were calculated to assess possible relationships between age and study variables. Age was weakly correlated with body distress, to a significant degree ($r(219) = .17$, $p < .01$). Moreover, age also displayed weak, but significant, negative correlations with all social media study variables (daily social media use - ($r(1215) = -.16$, $p < .05$), photo engagement ($r(216) = -.21$, $p < .01$), and mindless social media (SM) use ($r(218) = -.15$, $p < .05$). Age displayed similar relationships to most disordered eating risk factor variables (internalized thin ideal ($r(207) = -.37$, $p < .01$), weight bias ($r(216) = -.17$, $p < .05$), and some body distress outcome measures (exercise attitudes ($r(201) = -.15$, $p < .05$), and self-esteem ($r(125) = -.25$, $p < .01$).

Next, Spearman's Correlation Coefficients were calculated and a one-way ANOVA was conducted to assess if there were statistically significant differences on study variables by race. Race was only found to be associated with body distress scores ($r(220) = -.17$, $p < .05$). ANOVA results confirm statistically significant differences in body distress by race ($F(2, 214) = 2.88$, $p = .007$). Individuals identifying as biracial reported the most body distress ($M = -1.50$, $SD = 2.12$) followed by those identifying as East Asian ($M = 1.14$, $SD = .90$), whereas individuals identifying as black individuals reported the lowest body distress ($M = -.04$, $SD = 1.06$). A negative score on this measure indicates, on average, the ideal body image is larger than their current body. Additionally, individuals identifying as Native American also

demonstrated negative scores (M= -1.00, SD = 1.41. Of note, only two participants identified as Native American and only two identified as Biracial.

Body Mass Index. The initial mean BMI of participants was 24.78 (SD= 6.49) which is considered in the normal range. However, there were a number of data quality concerns for this variable. First, twenty-two participants did not provide enough information to calculate BMI; most typically current weight was not provided. Additionally, a number of participants provided BMI metrics that were suspiciously low and likely could not support human life, typically a weight that was unrealistically low compared to height.

According to the CDC, a BMI below 18.5 falls into the underweight category (CDC, 2021) and has been found to be associated with increased risk of all-cause mortality (Roh et al., 2014). The 5th version of the Diagnostic Statistical Manual (DSM-5) breaks down this category further through its severity ratings of the eating disorder Anorexia Nervosa (AN). A BMI of 17 and greater indicates mild AN, 16-16.99 to be moderate AN, 15-15.99 to be severe AN and below 15 to be extreme AN (American Psychiatric Association, 2013). A total of 24 (11.7%) participants in the current sample reported a BMI below 17, but denied diagnosis of or treatment for an eating disorder in their lifetime. Participants who reported a BMI of lower than 15 (n= 15) were recoded into missing data. This decision was made based on the DSM-5 classification specifications of AN. If height and weight were accurately reported and calculated a BMI lower than 15, it is very likely these individuals would have an extremely severe eating disorder. Alternatively, it is possible these numbers were not accurately reported and are functioning as outliers in the dataset. The mean BMI after recoding these responses is 25.93 (SD= 5.47), with minimum BMI of 15.62 and maximum of 46.93. This BMI is considered slightly overweight, but is lower than the mean BMI of American women in 2018, which was 29.8 (CDC, 2021).

Body Distress. The measure of body distress was calculated using responses from the Figure Rating Scale, as reviewed above. In the current sample, the mean current body image score is 4.94 (SD=1.46) and the mean ideal body rating score is 4.23 (SD= 1.56); meaning, on average, a participant's ideal body size is smaller than their current body size. Results of a paired sample t-test reveal significant differences between the two scores ($t(221) = 7.41$, $p < .001$).

Social Media Usage. Participants reported spending, on average, 54.25 hours on the internet per week (SD=39.77). When asked how much time per day from 0 (never) to 4 (always) participants spend on social media each day, the mean response was 2.52 (SD=.913). The most frequently used social networking platform was Facebook (M=3.63, SD=1.27), followed by Instagram (M=3.44, SD=1.42), which were almost used daily, on average, by participants. Twitter was used slightly less frequently by participants, but still more than weekly, on average (M=2.76, SD=1.69).

Participants were asked to provide details about the ways in which they engage with social networking sites, using the Facebook Activity Scale (FAS). Despite the name, the FAS assesses activity across a number of social media platforms, in addition to Facebook. Participants reported using social media more than half of the time to keep in touch with friends (M=2.86, SD=.92) and because it is enjoyable (M=2.79, SD = 1.08). Age significantly predicted use of Instagram ($\beta = -.036$ $t(222)= -4.47$, $p < .001$), Reddit ($\beta = -.041$ $t(222)= -4.18$, $p < .001$), Snapchat ($\beta = -.033$ $t(221)= -3.37$, $p < .001$), and Twitter ($\beta = -.02$, $t(222)=-2.21$, $p= .028$), with younger individuals more likely to use these applications more frequently than older ones. Age was not associated with Facebook use.

Qualitative Data Analyses. Qualitative data were collected, in addition to the FAS data, to better understand social media motivations and subsequent outcomes. Qualitative data were

analyzed using thematic coding techniques. Open-ended responses were coded by two coders based on a thematic coding scheme created by the primary researcher.

The most common reason participants reported using social networking platforms was to connect with others (n=121), followed by news or information gathering (n=63) and for entertainment purposes or to pass the time (n=56). Nine participants indicated using social media for food or recipe ideas (n=4) and/or other health information seeking purposes (n=5). Thirty-one participants reported reasons that were not included in the current analyses, either because they were unintelligible or because they were located via a Google search. The inter-rater agreement was 91.3%. When disagreement occurred, the raters met and discussed before coming to a resolution in coding.

To better understand participant's motives for accessing health and fitness content on social media, an open-ended response question was asked. Twenty-three participants reported they access this type of content to maintain their health. Others said they do so to improve their health (n=22), to access tips or knowledge of new recipes or workouts (n=58), to lose weight (n=10) and for general motivation or encouragement related to health (n=20). Notably, 13 participants indicated they use social media for this content for a reason that involves social support or interaction with others in relation to fitness. Nine other responses included reasons such as inspiration for workout outfits, improved energy, or for stress relief or mental health needs. Forty-two (42.3%) percent of responses (n=94) indicated participants either did not engage with this content, they left the question blank, or provided a response that was copied from the internet or was otherwise unintelligible. The inter-rater agreement was 78.3%. When disagreement occurred, the raters met and discussed before coming to a resolution in coding.

One question designed to explore the impact of seeing health and fitness content on social media was also included. Most participants reported a positive impact (n=79), such as increased motivation to engage in physical activity, cook healthier or "cleaner" meals, or continue to move towards health goals. Another 15 participants explicitly indicated negative impacts, such as engaging in social comparison behaviors, or feeling inadequate as compared to others on social media. An additional 14 participants reported both positive and negative impacts, whereas 29 reported not being impacted at all. Finally, 20 participants indicated they were impacted but it could not be determined if these impacts were positive or negative. For example, one respondent said "fairly impacted", and another said "I think I'm impacted to think if I do or eat certain things then I'll look like fitness influencers". This can either be inspiring and motivating, or conversely, it can potentially be discouraging or create feelings of hopeless. Some participants also indicated they are intentional about unfollowing social media accounts that do not post content that aligns with their values, for instance ones that don't promote health at every size. The inter-rater agreement was 81.6%. When disagreement occurred, the raters met and discussed before coming to a resolution in coding.

Manipulation Check. Two manipulation checks were included in the current study. The first was a series of questions that asked participants to rate the degree to which they believe each photo that they viewed depicted health and fitness content. Those scores were summed and the means compared. Images from the control condition had the lowest scores, on average ($M= 40.86$, $SD = 17.40$; $t(66) = 19.50$, $p < .001$), followed by the fitspiration group ($M= 49.36$, $SD = 12.93$; ($t(67) = 31.95$, $p < .001$). Images from the health condition had the highest mean score ($M=58.75$, $SD=9.29$; ($t(62) = 51.00$, $p < .001$), indicating these images were most likely to be

rated as representing health and fitness by participants. These differences were statistically significant.

Another manipulation check was included in the study which asked participants to categorize the images they viewed into one of three groups. One visual containing all 18 images was presented and participants were asked to select a category with which they believe the images best correspond. The first two choices were the definitions of health and fitspiration previously outlined, and the third choice was "I do not believe these images fall into either of the two categories." One hundred and thirty participants passed the manipulation check (58.56%). More specifically, 50 (69.4%) participants in the health condition correctly identified the images they viewed as aligning with the definition of health. Fifteen participants in this condition (20.83%) believed the images they saw corresponded with the fitspiration definition, and another 3 participants (4.17%) did not believe the images fell into either category.

Fewer participants in the fitspiration group correctly identified their condition, with only 58.67% (n=44) selecting this definition. Another 24 (32%) participants incorrectly selected the health definition, and 7 (9.3%) selected neither. Finally, 48% (n=36) of participants in the control condition correctly categorized their images as such. Twenty-six (34.67%) incorrectly selected the definition of health, whereas 17.33% (n=13) incorrectly selected the definition of fitspiration.

Confirmatory Factor Analysis. Prior to engaging in hypothesis testing, the goodness of fit for the proposed model was assessed. To do this, a series of checks were completed using both IBM SPSS version 27 and IBM SPSS AMOS version 26. First, correlations were conducted between all observed variables in the model. Next, confirmatory factor analyses (CFA) were performed to assess the degree to which observed variables fit within the proposed latent variables. Next, exploratory factor analysis (EFA) fit indices and factor loadings were assessed

for the proposed model including all study variables. To view all descriptive statistics of the study variables, including Cronbach's alphas of the latent variables if an observed variable is removed, view table 3. To see Pearson's Correlation Coefficients (i.e. correlations) between all study variables in the proposed model, see table 4.

Maladaptive Social Media Use. The Cronbach's alpha of this latent variable, which is comprised of the 3 observed variables, is very low (α= .071) and the variables account for 60.84% of the total variance in Maladaptive Social Media use. If the observed variable measuring the percentage of time spent engaging with photos is removed, the scale's internal consistency improves considerably, but is still questionable (α=.69). All observed variables in maladaptive social media use are significantly positively correlated with each other at the $p < .01$ level, although, the correlations are relatively weak and only the correlation between intentionality and time on social media per day surpassed .30 ($r (215) = .63$, $p < .01$; see table 4). The factor loading of intentionality is .76, time on social media per day is .82, and percentage of time on the photo features is .37.

Disordered Eating Risk Factors. BMI, internalized thin ideal, social comparison orientation and weight bias account for 48% of the variance in this latent variable. The Cronbach's alpha is questionable (α=.59). If BMI is removed, the alpha improves, but is still questionable (α=.64). Correlation analyses reveal that internalized thin ideal is significantly positively correlated with social comparison orientation ($r (208) = .49$, $p < .01$) and weight bias internalization ($r (205) = .46$, $p < .01$). Weight bias internalization is also positively correlated with social comparison orientation ($r (216) = .40$, $p < .01$) and BMI ($r (181) = .28$, $p < .01$). BMI is not significantly correlated with social comparison orientation or internalized thin ideal, and the insignificant correlations observed with both variables are negative. CFA results reveal that,

broadly speaking, these items do not load together as factor loadings could not be determined after 25 iterations. Therefore, factor loading scores cannot be reported for this latent variable. It is likely that this is, in part, due to the weak correlations between items.

Body Image Distress. Exercise attitudes, self-esteem, body image concerns and body distress account for 46% of the variance in this latent variable. The internal consistency of these measures together is poor, (α=.48) To slightly improve this alpha (to α=.57), body distress can be removed. Significantly positive, but weak, correlations were found between many of the observed variables including exercise attitudes and body image ($r(191) = .35$, $p < .01$), and exercise attitudes and self-esteem ($r(198) = .19$, $p < .01$). However, body distress is negatively correlated with self-esteem ($r(216) = -.18$, $p < .01$) and exercise attitudes ($r(202) = -.39$, $p < .01$). Notably and surprisingly, self-esteem is significantly positively correlated with obligatory exercise attitudes ($r(198) = .19$, $p < .01$) and body image concerns ($r(203) = .54$, $p < .01$). CFA results revealed that, broadly speaking, these items do not load together as factor loadings could not be determined after 25 iterations. Therefore, factor loading scores cannot be reported for this latent variable.

Table 4

Means, standard deviations and intercorrelation matrix of observed variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. SM time per day	2.51	0.92										
2. Photo usage percent	55.26	31.02	.29**									
3. Intentionality	5.26	1.69	.63**	.28**								
4. BMI	25.93	5.47	-0.13	-0.01	-.001							
5. Social Comparison	27.5	6.58	.24**	.14*	.37**	-.01						
6. Weight Bias Internalization	46.52	14.24	.28**	.16*	.32**	.28**	.40**					

7. Internalized Thin Ideal	27.96	7.46	.31**	.25**	.36**	-.02	.49**	.46**				
8. Body Distress (Figure rating)	0.71	1.42	- .34**	-.15*	-.12	.34**	-.05	-.08	-.11			
9. Obligatory Exercise Attitudes	50.19	10.45	.45**	.19**	.24**	-.23**	.24**	.34**	.34**	-.39**		
10. Self-Esteem	27.69	4.34	.30**	0.12	.31**	.03	.31**	.66**	.34**	-.18**	.21**	
11. Body Image concerns	46.7	14.40	.31**	.16*	.34**	.18*	.40**	.74**	.45**	-.05	.35**	.52**

* indicates significance at the p < .05 level; ** indicates significance at the p < .01 level

EFA of Study Variables. To determine the fit and structure of the proposed model, another factor analysis was performed including all study variables in SPSS. Because a number of study variables are correlated with one another, and theoretically the latent variables should also be correlated with each other, an Oblimin rotation method was utilized.

Results reveal 3 factors exist and explain 62.73% of the variance observed. The factor loading matrix is presented in table 5. All study variables have primary loadings over .6, but internalized thin-ideal and intentionality demonstrate cross-loading around .4, and primary loadings near .6.

The three factors identified are as follows: all social media items load onto one factor (time per day, photo usage, intentionality); internalized thin ideal, self-esteem, body image concerns, social comparison orientation and weight bias internalization load onto a second factor, and body distress, BMI and exercise attitudes load onto a third factor. Internal consistency for each factor identified was examined using Cronbach's alpha. The factor comprising weight bias, body image concerns, self-esteem and internalized thin ideal is adequate (α= .78), however the other two are poor (F2 α= -.46, F3 α= .07).

Table 5.
EFA results with all study variables

	F1	F2	F3
Weight Bias	**0.914**		
Body Image concerns	**0.868**		

Self-Esteem	**0.775**		
Internalized Thin Ideal	**0.623**		0.465
Social Comparison Orientation	**0.614**		0.391
Body Distress		**0.803**	
BMI		**0.722**	
Exercise Attitudes	0.378	**-0.707**	0.315
SM Intentionality	0.459		**0.789**
SM Time per day	0.343	-0.427	**0.765**
Photo Engagement			**0.737**

Hypothesis testing. To test H1, which was that participants who view fitspiration images from social media will exhibit lower scores on outcome measures than those who view health and fitness images without eating disordered undertones, a series of one-way ANOVA's were computed. To review the full ANOVA results, see table 6, however, there were no significant differences found between groups on any of the body distress outcome measures. Because significant differences in age were observed by study condition, and age was significantly correlated with most outcome variables, an ANCOVA was conducted controlling for age. Results revealed no significant differences by condition on outcome measures when controlling for age.

To test H2, which is that greater maladaptive social media use will predict more body-image related distress, SEM was conducted in AMOS. To test H2, no changes were made to the latent variables at this stage in response to the statistical results reported above. As suspected based on the weak correlations and bad factor analyses reported earlier, the fit of this model was poor $\chi^2(13, N = 222) = 73.11$, $p = .000$, CFI = .82, RMSEA = .15 (90% CI .11-.18) TLI= .61. and therefore, regression weights and factor loadings are not reported (Byrne, 2016).

Hypothesis 3 (H3) predicted that risk factors for disordered eating attitudes and behaviors (i.e. disordered eating risk factors) would moderate the relationship between social media use and body-image related distress outcomes, such that those with higher disordered eating risk factors will exhibit more distress. Disordered eating risk factors identified above were included as observed variables, including internalization of thin ideal, weight bias, and BMI. Additionally, because social comparison behaviors have been theoretically linked to negative body image outcomes, and have been shown to influence the relationship between social media use and multiple measures of distress, social comparison behaviors were also be included in this analysis. The fit of this model was poor $\chi^2(41, N = 222) = 169.35$, $p = .000$, CFI = .82, RMSEA = .12 (90% CI .10-.14), TLI = .71, and thus the moderation analysis was not carried out and regression weights are not interpreted or reported.

Alternative Models. Because the data did not fit the models as hypothesized, new models were explored integrating theory with the statistical outcomes reviewed throughout this chapter.

First, theoretically identified risk factors of disordered eating should predict negative body image outcomes. This model was tested, and revealed a relatively poor fit. $\chi^2(19, N = 222) = 113.98$, $p = .000$, CFI = .81, RMSEA = .15 (90% CI .12-.18), TLI = .64. To improve fit indices of this model, body distress was excluded from body image outcomes latent variable because of poor correlational statistics and factor analyses results. Additionally, BMI was removed from eating disorder risk factors due to poor correlation statistics, improvement in the latent variables internal consistency in doing so, and overall data quality concerns. This improved fit indices further, $\chi^2(8, N = 222) = 30.83$, $p = .000$, CFI = .95, RMSEA = .11 (90% CI .07-.16), TLI = .86, particularly the CFI and RMSEA. The CFI captures the amount of variance and covariance,

whereas the RMSEA represents the difference between observed error variance and approximation of error in the population (Byrne, 2016). RMSEA is thought to be one of the most valuable fit indices (Byrne, 2016), and therefore is considered more heavily here- the CFI improvement indicates good model fit, however the RMSEA improvement still indicates poor fit.

Next, when the latent variable of maladaptive social media use was re-introduced to the model without the photo engagement variable, as informed by correlation results and improvement in internal consistency if it is removed, little change in fit indices are observed $\chi^2(17, N = 222) = 68.18$, $p = .000$, CFI = .92, RMSEA = .11 (90% CI .09-.15), TLI = .82.

Post-Hoc Results

In an attempt to better understand possible reasons for the inadequate study findings, and concerns over potential data quality issues, post-hoc analyses were conducted with only participants who passed the manipulation check. A total of 130 participants were included in these analyses. Unfortunately, this sample size is too small to conduct SEM or factor analyses. Therefore, only a portion of the analyses could be replicated including: compare manipulation check outcomes, calculate correlation coefficients and re-examine H1.

In this subsample, the age of participants was not significantly different by condition. There were no other significant differences in demographic variables by condition. The means and standard deviations of study variables are generally similar to those in the full sample, and can be viewed in their entirety in table 7. Similarly, correlation coefficients were also comparable to the full experimental results, although there were slight difference. See table 8 for correlation coefficients of study variables for the post-hoc sample. All participants in this sample passed the manipulation check asking them to select the group to which the images they viewed belong. The second manipulation check, asking participants to rate the degree to which each

image depicts health and fitness content were calculated. Differences between mean scores were still significant, and larger for this sample than in the original sample, especially the difference between the control condition's mean score (M=29.50, SD=13.89; t (31) = 12.39, $p < .001$) and the other two conditions: fitspiration M=48.40 SD= 13.21 (t (39) = 23.75, $p < .001$), health M=59.07, SD = 9.60 (t (42) = 41.29, $p < .001$).

To explore H1, which is that significant differences will be observed in outcome measures by condition, another series of one-way ANOVA's were conducted. Significant differences were noted by condition in body image concern. Participants had the highest mean scores, indicating the most distress, after viewing the fitspiration images (M= 48.84, SD = 13.83) followed by the health images (M = 45.82, SD = 15.25) and lastly the control images (M = 39.33 SD = 14.37; $F(2,119) = 4.123$, $p = .019$). These means are in the hypothesized direction. None of the other study variables differed on the basis of condition assignment.

CHAPTER 5: DISCUSSION

Summary

The overall purpose of the current study was to explore how individuals respond to health and fitness content from social media and to attempt to address a number of limitations in the current literature. Identified limitations include conflating health and fitness content with disordered-eating undertone content (Tiggemann & Zaccardo, 2016); not accounting for the ways in which social media is used in combination with risk factors that can lead to negative body-image outcomes; and restrictive sampling procedures and statistical analyses that might miss nuances as a result of their simplicity, especially because of restricted age or race during recruitment.

These limitations were translated into three aims AIM 1: To understand social media users' motives for viewing health and fitness content on social media; AIM 2: Explore if the effects of viewing health and fitness content are different from fitspiration content; AIM 3: Identify who may be at risk for experiencing negative outcomes following engagement with health and fitness content from social media. As such, three hypotheses were generated. H1 predicted that participants who were randomly assigned to view fitspiration content from social media would exhibit lower scores on outcome measures (e.g. self-esteem, body-esteem, exercise attitudes, body dissatisfaction) after viewing the experimental images than those who were assigned to view health and fitness content without eating disordered undertones. H2 predicted that greater maladaptive social media use would predict more body-image related distress. H3 predicted that risk factors for disordered eating attitudes and behaviors (i.e. disordered eating risk factors) would moderate the relationship between social media use and body-image related

distress outcomes, such that those with higher disordered eating risk factors would exhibit more distress.

Aim 1

To meet Aim 1 of the study, which was to better understand social media users' motives for viewing health and fitness content on social media, a series of open-ended questions were asked. Results show that participants in the current sample primarily use social media to connect with others or gather information, including health information. This is consistent with prior research (Hayes, van Stolk-Cooke & Muench, 2015). Next, participants revealed that the most common reason for accessing health information from social media was to learn new workout routines, tips or information. Participants commonly reported a goal of accessing this information to maintain or improve their health. Finally, participants were asked about their perception of the impacts that this content might have on them. Most participants reported that there were positive impacts of engaging with health and fitness content, while a handful did mention influences, social comparison tendencies, and overall negative impacts. Some even stated they are intentional about the types of content they follow, and unfollow content that does not align with their values or promote health at every size.

Despite some general concerns over the response rates to these qualitative questions, the participants who responded did help shed light on this area which is relatively underrepresented or explored in the literature. While participants were for the most part positive about health content on social media, a good amount of participants did indicate negative impacts as a result of this content to the point of limiting the amount or type of content to which they are exposed. While the quantitative data did not necessarily support negative outcomes based on type of

content viewed, it is clear from the qualitative responses that some people do have negative outcomes and have changed their social media use habits as a result.

Aim 2 and Aim 3

Overwhelmingly, the null hypotheses could not be rejected. Specifically, there were no significant differences in outcome measures by condition, maladaptive social media use did not predict body distress outcomes, and the variables of interest demonstrated poor fit indices in SEM. Consequently, the impacts of eating disordered risk factors moderating the relationship between maladaptive social media use and body distress outcomes could not be analyzed as proposed. There are three potential reasons for the current findings: (1) the results are valid and interpretable and the identified factors do not contribute to negative body image outcomes in the hypothesized ways; (2) there was a manipulation failure in the current study, impacting the degree to which the intended response was elicited in participants; or (3) the overall data quality is suspect, and thus interferes with revealing the relationships that are hypothesized. Additionally, it is possible that a combination of the three aforementioned factors contributed in varying degrees to impact the observed findings.

Interpretation of the results

Valid Results, Null Findings. The results of the current study did not reveal significant associations between study variables as hypothesized. Maladaptive social media use may not be predictive of body distress, and this relationship may not be influenced by eating disordered risk factors. Correlation coefficients generally revealed weak relationships between study variables, which is likely related to the overall lack of findings. Generally, these findings are in contrast to previous literature, although, there are a few study specific factors that may be contributing to this misalignment. For example, older age is known to be a preventative factor for both eating

disorders (Keski-Rahkonen et al., 2007) and negative outcomes after engaging with social media use (van Igen, Rains, & Wright, 2017; Hayes, van Stolk-Cooke & Muench, 2015). One of the initial goals of the current study was to understand the impacts of social media use beyond emerging adulthood, and, thus, researchers intentionally sampled a variety of ages. Perhaps including ages beyond emerging adulthood in one study created too much noise in the data such that the number of participants who experienced negative outcomes because of the social media images is too small to be detected in aggregate with the entire sample. Study specific factors and research design could have contributed in a number of ways to the null findings.

While sampling error could be one potential explanation for the lack of findings in the current study, another potential explanation could be that the results are valid, and no differences exist in distress as a result of engaging with different types of content from social media. No differences in outcome measures were found by condition, suggesting that content from social media, regardless of the subject matter and health messaging, does not differentially impact users. The current literature suggests this is not the case (see introduction for a review). However, it is possible that the only studies currently published are those which have found differences, and additional studies that have not found differences were not accepted for publication.

Manipulation Failure. While it is possible that the current results are a fully authentic representation of the lack of impact that engagement with health and fitspiration content has on users, it is also possible there was a manipulation failure. The results of the second manipulation check item, which asked participants to correctly identify the category to which the images they viewed belong, are a bit concerning- almost half (41%) of participants incorrectly identified the group to which their images belonged. There could be a number of potential reasons for this,

such as the images that were included in the experiment that did not sufficiently elicit the intended construct, and/or too much shared variance exists between the constructs of interest (health and fitspiration) such that they cannot be considered entirely distinct from each other. Again, the latter factor is not supported by the literature, however it is possible that only studies highlighting differences have been accepted for publication.

Multiple factors could have led to a manipulation failure in the experimental study such as including inadequate images from pilot testing results, or there was insufficient engagement by participants with the images. Pilot test results did not always highlight strong differences between fitspiration and health image ratings. A number of images included in the experimental study had scores that were not explicitly conclusive on the degree to which an image solely represented one construct and did not represent the other. This may be because there is not enough difference between the two types of images to be exploring them as separate entities. This may also be because the images selected to be evaluated in the piloting procedures were inadequate, and additional images should have been identified before moving to the experimental study. Moreover, existing literature suggests that individuals are not great at determining when they are confusing health content for fitspiration content or vice versa, or are generally not finding fitspiration content to be problematic (Jong & Drummond, 2016). In some ways this manipulation check's results support this notion. Furthermore, participants were more accurate in identifying health images as representative of health, and less so at detecting fitspiration content in fitspiration images. Instead, they sometimes confused these images as also representing health. These results suggest people might be unknowingly consuming fitspiration content. It is also possible that the images selected represented the conditions sufficiently, but participants did not relate to or engage with the images sufficiently.

Study design included two questions to increase engagement with or attentiveness to the social media images. One of these questions was to rate the overall quality of the photos, which was informed by previous research (Tiggeman & Zaccardo, 2015). The second, was to assess the degree to which each image represented health content. This question was included to increase engagement, and also to act as a second manipulation check. Results of these analyses revealed that participants indicated images from the control condition, on average, had the lowest health scores suggesting they were least likely to be depicting health content according to participants in that condition. Fitspiration and health images had higher scores, with health images having the highest scores. These results suggest participants were engaging with the photos, as the ratings were in the hypothesized directions and significantly different from one another. This suggests that participants were attentive to the images portion of the study. Combining the results from both manipulation checks suggest that participants were likely attentive to a sufficient degree, but the images either did not align with the definition of health and fitspiration provided by the researcher, or did not evoke the same response that has been evoked in previous studies.

Misalignment between image condition definitions and the images themselves could be due to participants not understanding the difference between the constructs, participants not agreeing with the definitions, or, potentially because participants had a previous definition of health or fitspiration that did not align with the ones provided in the current study. Despite misalignment, participants could have selected the category label which aligned with their own definition, without actually reading the definition provided. The current study did not ask participants to define the constructs themselves to determine the degree to which there was overlap between a participant's understanding of health and the conceptualization of health for the current study. Misalignment could explain potential confusion between health and fitspiration

conditions. However, this becomes less of an explanation for results of the manipulation check for the control condition.

Control images were comprised of nature images, often of landscapes or sunsets. It is possible that participants could have conceptualized this as representing wellness in a more holistic way, which would explain why participants in this condition selected the health category to best represent their images. This same explanation does not apply as strongly to the control participants who selected fitspiration as being the best definition for their images. A number of participants in the control condition selected the fitspiration category to be the one with which their images best align. Potentially, participants did not know which option to select because they believed their images should fall into one of the two defined options, rather than a third "none of the above" option. Thus, they selected one of the two remaining options at random.

When considering a manipulation check failure as a potential explanation for null findings, a number of factors should be evaluated beginning with pilot study design and results, though the results from the experimental portion of the study. These include the images did not sufficiently represent the constructs identified, there is too much variance between constructs to parse out individual contributions of health and fitspiration, or a possible misalignment with a participant's conceptualization of health or fitness and the one provided by the researchers. While any combination of these situations could have occurred, there are a number of results which also indicate possible concerns with overall data quality, which are described next.

Data Quality Concerns. It is possible that a manipulation failure occurred, as indicated by the manipulation check results. However, it is very possible that the null study findings are primarily due to poor data. Data quality concerns were present for the researcher since the recruitment phase of the study. For example, more than half of individuals who attempted to

enroll into the study did not meet eligibility requirements that were clearly outlined in the study advertisement. This resulted in extended recruitment times and additional precautions for data cleaning criteria. Additional concerns include correlations between variables in the opposite direction that one would expect based on theory, and weak correlations between variables that are theoretically strongly related to one another.

Concerns over the degree to which participants attended to research questions formed early on, and motivated the researcher to employ a conservative approach to data cleaning. Participants were removed if they did not complete 99% of the survey (n =135) or if they provided poor quality data (e.g. acquiescent responding, n=71). Doing so improved the Cronbach's alphas of key study variables slightly, so it was deemed worthy of reducing the sample size to have more reliable data. Despite conservative cleaning procedures, a number of additional concerns were identified when analyzing the qualitative data.

Data quality for qualitative questions during online questionnaires is thought to be of a poorer quality because of the increased physical and cognitive effort required to answer as compared to quantitative, multiple choice responses (Desai & Reimers, 2019). Open-ended responses in this study were consistently problematic across the four open-ended questions, despite the length of question or requested response. Early on, participants were asked three open-ended questions about motives for social media use and the impact of engaging with health content from social media. A good number of participants provided answers that were found during a Google search by the researcher to verify the originality of responses. Moreover, an additional number of participants copied and pasted the question into the space provided for a response, or simply wrote "FACEBOOK" or "good" into the response box. In addition, the wording of a substantial portion of the responses was consistent with people for whom English is

not their first language. While this did not explicitly make them ineligible for the study, lack of familiarity with some English words could have significantly impacted their responses and contributed to poor data quality. Finally, while one can argue that qualitative responses require more energy and effort from participants than providing quantitative data, these questions were presented early in the study to account for the potential impact that fatigue might have had on the quality of responses provided.

Researchers attempted to counterbalance potential fatigue by asking open-ended questions about social media use early in the study. Additionally, questions assessing height and weight were also asked early on during a demographic section which was mostly used to screen for eligibility prior to enrollment. A surprising number of participants who were eligible and enrolled into the study did not provide a response when asked to provide their weight, or, provided a weight that was suspect (ex: 20 lbs). In a large-scale study of over seven thousand women across the United States, Luo and colleagues (2019) empirically investigated the accuracy of self-reported weight versus measured weights. Results show a strong positive correlation between the two ($r = .97$), but that women tend to under-report their weight, on average, by 2 pounds (Luo et al., 2019). Unfortunately, this seems to not be the experience of the current project. Complete and accurate or original responses were not always provided for open-ended questions, as reviewed above. Unfortunately, the degree to which participants were attentive and engaged with quantitative questions is also in question for the current study. This is, in part, because of relationships found between study variables that were much weaker than in previous literature, or in the opposite direction as one would hypothesize.

A relatively large body of literature exists to support a positive relationship between various eating disorder risk factors (see: introduction and literature review sections). While many

of the current study variables were positively correlated, a number were negatively correlated despite appearing positively related at a theoretical level. These include: body distress and social comparison orientation, body distress and weight bias internalization, body distress and internalized thin ideal, and body distress and body esteem. Furthermore, confusing positive correlations between self-esteem and negative body image variables were observed such as obligatory exercise attitudes, internalized thin ideal, and weight bias internalization. At the same time, self-esteem was negatively associated with BMI, which is consistent with previous literature including studies showing increases in self-esteem following weight loss (i.e. reduction in BMI; French et al., 1995). Finally, body distress and BMI should be positively correlated according to well-established literature, (Cardinal, Kaciroto & Lumeng, 2006) and it is, but not very strongly. It is difficult to interpret these results, and their existence adds weight to concerns over the quality of the data in the current study.

While individual relationships among key variables are concerning when considering overall data quality, they also likely contributed to the overall lack of findings. SEM explores relationships between study variables, and is sensitive to weak correlational coefficients. The study variables almost entirely displayed weak correlations, which likely impacted the goodness of fit for the SEM models. Whether this is due to data quality concerns or an actual lack of relationships existing between variables is difficult to determine. It seems that some combination of these two things likely led to null findings in the current study.

In an attempt to better understand the degree to which data quality and manipulation failure might be impacting study results, a series of post-hoc analyses were conducted including only participants who passed the manipulation check that asked participants to assign a label to

the images they viewed. While the number in this sample was too small to conduct SEM (n=130), other analyses could be conducted and their results interpreted.

Many results were fairly consistent with results from the broader sample, however a few differences were noted. First, the second manipulation check using scores of the degree to which images contained health content revealed larger differences in scores for control images as compared to health and fitspiration images. Second, a significant difference was found by condition for one outcome measuring body image. Despite these improved data points, weak and confusing correlations were still observed between study variables. These results suggest there may be a combination of factors occurring that led to the current null findings, including a failed manipulation check, poor data quality and an actual lack of relationship between study variables in the hypothesized directions.

Interpretation of Demographic Results.

The current study intentionally sampled diverse races and ages of participants. Participants represented a wide age, varying from 21 through age 70. Additionally, they were relatively diverse in terms of reported racial identity. These demographic results are consistent with other datasets using Mturk participants which suggested Mturk workers tend to be more diverse than samples recruited from social media or traditional university research pools (Casler, Bickel, & Hackett, 2013), and thus, met one identified goal of recruiting via Mturk. Despite this being an intention of the current study, diversity in age and race might also contribute to inconsistent and insignificant study findings.

While the age of participants was inclusive beyond the emerging adult age, age was found to be associated with a number of study variables. For example, age was significantly positively correlated with body distress and significantly negatively correlated with internalized

thin ideal, exercise attitudes, and self-esteem. While eating disorders have emerged in individuals as old as 70 (Zayed & Garry, 2017; Peebles et al., 2006), the typical age of onset of an eating disorder is during adolescence into young adulthood, or ages 12 through early 20s (Smink et al., 2012). The current data supports an "aging out" of cognitive factors often associated with development of eating disorders, which is consistent with the literature. Moreover, there were significant differences in the ways in which social media was used by age. Age was found to be significantly negatively correlated with mindless social media use and predictive of the use of a number of types of SNS such that younger folks were more likely to use them than older individuals.

These relationships suggest that age might actually be a protective factor for negative outcomes related to social media use, which has been found in previous studies (Hayes, van Stolk-Cooke & Muench, 2015). Age potentially as a protective factor for body image distress and maladaptive social media use might be related to increases in wisdom and maturity that are thought to be observed with increased age. Age could also be a proxy variable for digital natives versus digital immigrants. Digital natives are those born into an era where digital technologies are commonplace (i.e. born after the 1980s; Prensky, 2001) and thought to be more at-risk to negative outcomes after engaging with social media (Hayes, van Stolk-Cooke & Muench, 2015; Bennett, 2012).

The race of participants was found to also be associated with body distress scores. Statistically significant differences between body distress by race were revealed, such that individuals identifying as East Asian reported the highest mean scores of body distress, whereas those identifying as Biracial reported lowest mean body distress scores. Average body distress scores were in the negative direction for a number of non-white races, which indicates their ideal

body size is larger than their current body. This held true for participants identifying as Biracial, Black and Native American. The Figure Rating Scale used in the current study has been validated with a variety of races (Patt et al., 2002), however, racial differences are apparent in the current sample. There are other figure rating scales used in body image research, and one study found an alternative version is preferred for 72% of women of color in their sample (Patt et al., 2002). Despite this, current results are consistent with older studies in which non-white women were found to report lower levels of body dissatisfaction compared to white women (Abrams, Allen & Gray, 1993). Finally, the current findings that individuals identifying as East Asian have the highest levels of body dissatisfaction are also consistent with previous findings in the literature (Gordon, 2001).

Results in the literature looking more broadly, beyond body satisfaction, at differences in cognitive processes and behaviors related to eating disorders by race are mixed. For example, some studies have revealed that Black women had lower risk for disturbed eating attitudes and restrictive behaviors as compared to White women (for a meta-analysis see: O'Neill, 2003), whereas the UCLA Body Project, which recruited participants from United States, found no significant differences in eating disorder symptoms by ethnicity or race (Forbes & Frederick, 2008). Additional studies suggest that specific cultural factors might explain the mixed findings between race and eating disorders or body image distress, and a one-size-fits-all approach may not be appropriate (Gordon et al., 2010).

In sum, differences in variables by race and age were found, which are consistent with previous literature. It is possible that when conducting social media and disordered eating research, the age of participants must be restricted to emerging adults or younger age because of the likelihood that increased age acts as a protective factor for negative outcomes. Moreover,

racial identity of participants should be considered as body image outcomes appear to have racial differences, and might need more sensitive and nuanced measurement. While controlling for age or race should account for the covariance with study variables, especially in the ANOVA analyses, doing so did not change outcomes in the current study.

Limitations.

There are a number of limitations that could have impacted the current study results. These include manipulation failure, measurement error, data quality concerns, and covariance among variables. First, the data supplied by study participants is concerning in a number of ways, as reviewed above. Moreover, while participants in the study met goals in terms of demographic diversity, the quality of data provided by study participants was suspect despite following suggestions to recruit high quality Mturk workers (Johnson & Borden, 2012) and conservative approaches during data cleaning.

Concerns in data quality of Mturk workers and ways in which workers can circumvent limitations programmed into Mturk by a requester were recently explored by Dennis and colleagues (2020). Their work describes how it is relatively easy for an Mturk worker to change their IP address to meet eligibility criteria of a HIT, and report that it is fairly common to do so. IP address was restricted for the present study because there are cultural factors specific to women from the United Sates related to eating disorder risk factors. Moreover, being fluent in English was central to understanding and replying to the survey in an accurate way. While many individuals outside of the United Sates are fluent in English, it is possible individuals from other countries who were not fluent changed their IP addresses using a VPN to gain access to the current study. This might explain why some participants used text from the internet for open-ended responses, or provided unintelligible responses.

It is also possible that the quality of data provided by Mturk workers, who comprised the majority of participants, is compromised despite conservative data cleaning approaches. This argument is somewhat supported by the fact that only 2 participants who were recruited from social media (i.e. not recruited via Mturk) failed the manipulation check as compared to the large number of Mturk participants who also failed. It is possible that if a larger sample size were collected to support only including participants who passed the manipulation check, SEM fit indices might improve to the point of interpreting the model and regression coefficients. The high occurrence of low quality Mturk responses could potentially be related to study recruitment which occurred during the COVID-19 pandemic. During this time, global unemployment was high, and it is possible more individuals were in need of ways to earn money without being able to be as attentive to the quality of their work in online surveys.

In addition to data quality concerns limiting the current study, several study design components are also potentially problematic, such as potential measurement error, sampling error and/or a manipulation failure as a result of study design. From the test development literature, some controversy exists over a "none of the above" choice response, which was the correct choice for the manipulation check question for participants in the control condition. Generally speaking, this choice response is discouraged (Frey et al., 2005), and a meta-analysis revealed test questions are more difficult when they include this option as a response (Rodriguez et al., 2011), especially if the correct response is "none of the above" (Odegard & Koen, 2007). The correct choice for the control condition on this item was in fact a variation of "none of the above", which can potentially be problematic and have led to incorrect responses from study participants. Moreover, although BMI is found to be an eating disorder risk factor in previous studies, there are known concerns in the validity of BMI as a construct.

BMI is the observed score assigned to represent one's body mass index which is influenced by the amount of weight of, and fat on, a person. The average BMI of study participants was lower than the average BMI in the United States, suggesting participants in this sample have less fat on their bodies than the average American. Arguments have been made that BMI is not a good indicator of health because it does not measure actual body fat, rather, it uses total body weight which also includes muscle mass. Consequently, many argue that BMI should not be used to represent the amount of body fat a person holds. Body fat is more closely related to health issues and psychosocial distress than BMI more generally (Nuttall, 2015). Differences in the relationship between BMI and health outcomes are more profound for women of color, as BMI has not been consistently linked to mortality in the same ways for black women as other races (Stevens et al., 1998). Including all races into one study, or under sampling of minority races, might have contributed to lack of study findings because BMI was a key study variable. Moreover, it might not be best to include multiple races and ethnicities in one model, and separate, identity specific, models should be established accounting for cultural differences in body image, exercise attitudes and social media use.

Lastly, although diversity in age was an intended aim of the current project, the age range of participants is quite broad, and might have inadvertently impacted the results. This may have created inconsistencies in the results because age might act as a protective factor for negative outcomes on social media or body image distress. Finally, unfortunately, the random assignment of participants via Qualtrics was unsuccessful in that there were significant differences in age by condition. This was accounted for in some analyses but not the full SEM models.

Clinical Implications and Future Directions.

Despite the lack of significant results on more complex statistical analyses, the current results do have clinical implications, especially when considering the differences in body image outcomes by racial identity and age. Results highlight the potential protective nature of age and race, and more work can be done to understand the mechanisms through which this is achieved. If mechanisms can be better understood, interventions can be developed to enhance them, especially for those who are experiencing negative outcomes from social media use. Additionally, subsets of the current sample do indicate satisfaction with their body size. More work can be done to better understand this, and interventions can potentially be developed as a result. Future research should seek to continue to explore the impacts of social media use, and the degree to which health and fitness content is misrepresented on social media or conflated with eating disorder promotion content. Additionally, more work is needed to better understand the impacts of age on these constructs, and the mechanisms through which age might be working as a protective factor.

Finally, more research is needed into the quality of data from crowd-sourcing platforms, especially those which charge for their use in addition to participant payment. Is it time for social scientists to consider alternative ways to recruit a large number of participants, or are additional updated quality control steps needed to ensure data quality? More empirical work needs to be disseminated to shed light on these important issues, so social scientists can continue to use crowd sourcing platforms for participant recruitment or find alternative recruitment methods.

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APPENDIX A: SURVEY BATTERY

Social Media Questions:

Please describe your primary reasons for using a social media platform.

Please describe the types of content you encounter on social media which promotes health, wellness, or fitness. If you do not think you EVER encounter this content on social media, please say so.

Please describe your primary motives for accessing health and fitness content on social media, or for following health/fitness accounts. If you do not EVER access this content or follow these accounts, please say so.

How do you think you are impacted by being exposed to health and fitness content on social media. If you do not think you are at all impacted, please say so.

Approximately how much time do you spend on social media each day, on average?

0 *never* to 4 *always*

Of the total amount of time you spend on social media per day, how much of that time is spent looking at your own or other's photos? For example, if you ONLY have an Instagram account, and only use that account to look at photos of yourself and others, you would indicate "100%".

How often do you find yourself mindlessly scrolling on your social media feed?

0 *never* to 5 *always*

How often you know in advance what you will do when you open your social media accounts? For example, "I know I will check one individual's profile when I open my social media account, and close out of the program after checking that one account" would indicate "always".

0 *never* to 5 *always*

How often do you find yourself using social media longer than you intended to?

0 *never* to 5 *always*

<u>Descriptive Measures about Social Media Use</u> (Boyd and Harigiatti, 2010)

How frequently do you use the following applications?	Hourly	Daily	Weekly	Monthly	Less than monthly	I have never used this application
Facebook						
Fitbit						
Gmail						
Instagram						

Reddit						
Snapchat						
Twitter						
What's App						

<Branching based on responses to first question, only the items they have selected that they use will appear>

How many <u>years</u> have you used these applications? (If you do not know, give it your best guess)		I have never used this application
Facebook		
Fitbit		
Gmail		
Instagram		
Reddit		
Snapchat		
Twitter		
What's App		

How often do you:	Hourly	Daily	Weekly	Monthly	Less than monthly	I have never used this application
Post (upload a photo, share a video/story, make a status, share a link/article, etc.)						
Comment on or "like" others' posts						
View others' posts (without commenting or liking)						

How many hours do you typically spend on the internet in a given week?

1----------168 (sliding scale)

<u>Facebook Activity Scale</u> (Yang & Brown, 2013)

- 2 factors for motives: relationship formation and relationship maintenance.
- 5 factors for activities: electronic interactions, voyeurism, status updating, gaming, & health-related activities

How frequently do you use social networking sites (e.g., Facebook, Twitter, Instagram, Snapchat, etc.) for the following reasons?	1 (never)	2	3	4	5 (A lot)
Connect with someone I've met since college					
It's enjoyable					
Develop a romantic relationship					
Get in touch with someone I met at social events					
Check out someone I might want to know better					
Know who is friends with whom					
Find more interesting people than in real life					
Find out more about someone I've just met					
Keep in touch with my friends					
Meet new friends					
Stay connected with my college friends					
Present myself to others in the way I want them to see me					
How frequently do you engage in the following activities per week on social networking sites (e.g., Facebook, Twitter, Instagram, Snapchat, etc.)?	1 (never)	2	3	4	5 (A lot)
Posted on other people's walls					
Checked out people's walls without leaving a message					
Sent an inbox message (Facebook messenger)					
Commented on other's photos					
Checked out people's photos without leaving comments					
Updated your "what's on your mind?"					
Commented on others' "what's on your mind?"					
Checked out news feed					
Facebook chatted with others					
Posted a link					
Replied to others' comments on your profile photo, new photos, fan status, "what's on your mind" status, group status, notes, and links					
Checked out people's notes, links, and various status without leaving comments					
Shared/Posted a link to an article about health/wellness					
Read an article about health/wellness from your newsfeed					
Had a health-related discussion					
Trusted medical information shared by others					
Shared information about your health with other patients Shared information about your health with doctors					
Shared information about your health with hospitals					
Shared information about your health with health insurance companies					

Sought out medical answers					
Get meal planning ideas					
Get exercise routine ideas					

Weight Bias Internalization Scale
Please indicate how much you agree with the following statements from 1 (strongly disagree) to 7 (strongly agree)

Because of my weight, I feel that I am just as competent as anyone.1, 2
I am less attractive than most other people because of my weight.
I feel anxious about my weight because of what people might think of me.1
I wish I could drastically change my weight.
Whenever I think a lot about my weight, I feel depressed.1
I hate myself for my weight.1
My weight is a major way that I judge my value as a person.
I don't feel that I deserve to have a really fulfilling social life, because of my weight.
I am OK being the weight that I am.2
Because of my weight, I don't feel like my true self.1
Because of my weight, I don't understand how anyone attractive would want to date me.

Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3)

Please read each of the following items carefully and indicate the number that best reflects your agreement with the statement.

Definitely Disagree = 1
Mostly Disagree = 2
Neither Agree Nor Disagree = 3
Mostly Agree = 4
Definitely Agree = 5

1. TV programs are an important source of information about fashion and "being attractive."
2. I've felt pressure from TV or magazines to lose weight.
3. I do not care if my body looks like the body of people who are on TV.
4. I compare my body to the bodies of people who are on TV.
5. TV commercials are an important source of information about fashion and "being attractive."
6. I do not feel pressure from TV or magazines to look pretty.
7. I would like my body to look like the models who appear in magazines.
8. I compare my appearance to the appearance of TV and movie stars.
9. Music videos on TV are not an important source of information about fashion and "being attractive."
10. I've felt pressure from TV and magazines to be thin.
11. I would like my body to look like the people who are in movies.
12. I do not compare my body to the bodies of people who appear in magazines.
13. Magazine articles are not an important source of information about fashion and "being attractive."
14. I've felt pressure from TV or magazines to have a perfect body.

15. I wish I looked like the models in music videos.
16. I compare my appearance to the appearance of people in magazines.
17. Magazine advertisements are an important source of information about fashion and "being attractive."
18. I've felt pressure from TV or magazines to diet.
19. I do not wish to look as athletic as the people in magazines.
20. I compare my body to that of people in "good shape."
21. Pictures in magazines are an important source of information about fashion and "being attractive."
22. I've felt pressure from TV or magazines to exercise.
23. I wish I looked as athletic as sports stars.
24. I compare my body to that of people who are athletic.
25. Movies are an important source of information about fashion and "being attractive."
26. I've felt pressure from TV or magazines to change my appearance.
27. I do not try to look like the people on TV.
28. Movie starts are not an important source of information about fashion and "being attractive."
29. Famous people are an important source of information about fashion and "being attractive."
30. I try to look like sports athletes.

Scale for Social Comparison Orientation

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

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

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

PRESENT 18 IMAGES BASED ON RANDOMIZED CONDITION

Image 1 presented.

1. Please indicate how you would rate the quality of this photo from 1 *very poor quality* to 5 *very good quality*.
2. Please indicate how much this image depicts health or fitness related content from 0 *not at all* to 4 *completely*

Image 2 presented.

1. Please indicate how you would rate the quality of this photo from 1 *very poor quality* to 5 *very good quality*.
2. Please indicate how much this image depicts health or fitness related content from 0 *not at all* to 4 *completely*

[Complete for all 18 images]

Obligatory Exercise Scale

Listed below are a series of statements about people's exercise habits. Please circle the number that reflects how often you could make the following statements:

1 – NEVER 2 – SOMETIMES 3 – USUALLY 4 – ALWAYS

1. I engage in physical exercise on a daily basis.

2. I engage in one/more of the following forms of exercise: walking, jogging/running or weightlifting.

3. I exercise more than three days per week.

4. When I don't exercise I feel guilty.

5. I sometimes feel like I don't want to exercise, but I go ahead and push myself anyway.

6. My best friend likes to exercise.

7. When I miss an exercise session, I feel concerned about my body possibly getting out of shape.

8. If I have planned to exercise at a particular time and something unexpected comes up (like an old friend comes to visit or I have some work to do that needs immediate attention) I will usually skip my exercise for that day.

9. If I miss a planned workout, I attempt to make up for it the next day.

10. I may miss a day of exercise for no good reason.

11. Sometimes, I feel a need to exercise twice in one day, even though I may feel a little tired.

12. If I feel I have overeaten, I will try to make up for it by increasing the amount I exercise.

13. When I miss a scheduled exercise session I may feel tense, irritable or depressed.

14. Sometimes, I find that my mind wanders to thoughts about exercising.

15. I have had daydreams about exercising.

16. I keep a record of my exercise performance, such as how long I work out, how far or fast I run.

17. I have experienced a feeling of euphoria or a "high" during or after an exercise session.

18. I frequently "push myself to the limits."

19. I have exercised when advised against such activity (i.e. by a doctor, friend, etc.)

20. I will engage in other forms of exercise if I am unable to engage in my usual form of exercise.

Rosenberg Self-Esteem Scale
Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

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

Strongly Agree Agree Disagree Strongly Disagree

BSQ-16B

We should like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all the questions.
Never, rarely, sometimes, often, very often
Over the past 4 weeks:

1.	Have you been so worried about your shape that you have been feeling you ought to diet?.....	1	2	3	4	5	6
2.	Have you been afraid that you might become fat (or fatter)?.....	1	2	3	4	5	6
3.	Has feeling full (e.g. after eating a large meal) made you feel fat?.....	1	2	3	4	5	6
4.	Have you noticed the shape of other women and felt that your own shape compared unfavourably?.....	1	2	3	4	5	6
5.	Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening to conversations)?.....	1	2	3	4	5	6
6.	Has being naked, such as when taking a bath, made you feel fat?.....	1	2	3	4	5	6
7.	Have you imagined cutting off fleshy areas of your body?.....	1	2	3	4	5	6
8.	Have you not gone out to social occasions (e.g. parties) because you have felt bad about your shape?.....	1	2	3	4	5	6
9.	Have you felt excessively large and rounded?.....	1	2	3	4	5	6

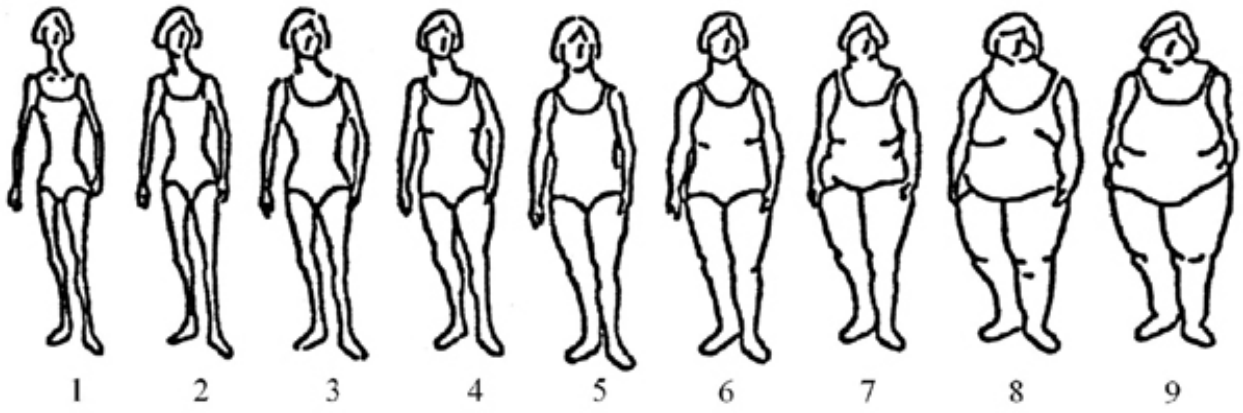
10.	Have you thought that you are in the shape you are because you lack self-control?..... .	1	2	3	4	5	6
11.	Have you worried about other people seeing rolls of fat around your waist or stomach?.....	1	2	3	4	5	6
12.	When in company have your worried about taking up too much room (e.g. sitting on a sofa, or a bus seat)?.....	1	2	3	4	5	6
13.	Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?.....	1	2	3	4	5	6
14.	Have you pinched areas of your body to see how much fat there is?.....	1	2	3	4	5	6
15.	Have you avoided situations where people could see your body (e.g. communal changing rooms or swimming baths)?.....	1	2	3	4	5	6
16.	Have you been particularly self-conscious about your shape when in the company of other people?.....	1	2	3	4	5	6

Figure Rating Scale

Instructions:

Look at the pictures below and select the picture that most closely resembles how you currently look. Select the number that corresponds with the image.

1-9



Look at the pictures above and select the picture that most closely resembles your ideal image of yourself. Select the number that corresponds with the image.

1-9

Demographic Questionnaire:

What is your age? _____

What was your assigned sex at birth?

- Female
- Male

Other (*please specify*) _____

What is your current gender identity?

- Female
- Male
- Agender
- Bigender
- Genderqueer/Non-binary
- Transgender
- Transsexual
- Other (*please specify*) _____

What is your current height, in inches? ____

For reference:

3 feet= 36 inches
4 feet = 48 inches
5 feet = 60 inches
6 feet = 72 inches
7 feet= 80 inches

Current Weight in pounds: ___

Have you ever received professional treatment for concerns related to eating behaviors?

No
Yes

If yes, from who did you receive treatment? _____

Have you ever been diagnosed by a professional with an eating disorder?

No
Yes

If yes, by who were you diagnosed? _____

As far as you know, are you currently pregnant?

Yes
No

What is your sexual orientation?

- Exclusively heterosexual/straight
- Mostly heterosexual, only incidentally homosexual/gay/lesbian
- Equally heterosexual/straight and homosexual/gay/lesbian
- Mostly homosexual/gay/lesbian, only incidentally heterosexual
- Exclusively homosexual/gay/lesbian
- Pansexual
- Queer
- Asexual: No socio-sexual contacts or reactions

What is your relationship status?

- Single (i.e., no current sexual or romantic partners)
- I am in a sexual, but non-romantic relationship
- Casually dating (i.e., I am in a non-monogamous romantic relationship)
- Exclusively dating (i.e., I am in a monogamous romantic relationship)
- Engaged to be married
- Married/Civil Union/Domestic Partnership

Other (*Please Specify*): _____

Are you Spanish, Hispanic, or Latino/a? (e.g., Mexican or Mexican American, Cuban or Cuban American, Puerto Rican, Dominican, Central or South American)

- Yes

- No
- I would rather not report this

What do you consider your primary race/origin? (Select all that apply)

- White or European American (e.g., Irish, German, Italian, Lebanese, Arab, Moroccan, etc.)
- Hispanic, Latino/a, or Spanish Origin (e.g., Mexican or Mexican American, Puerto Rican, Cuban Dominican, etc.)
- Black or African American or Afro-Caribbean (e.g., African American, Kenyan, Nigerian, Haitian, etc.)
- East Asian or East Asian American (e.g., Chinese, Korean, Japanese etc.)
- South Asian or South Asian American
- Middle Eastern or Arab American or North African
- American Indian or Alaska Native or First Nations (e.g., Navajo, Blackfeet, Inupiat, Central or South American Indian groups, etc.)
- Native Hawaiian or Other Pacific Islander (e.g., Native Hawaiian, Guamanian, Samoan, etc.)
- Biracial or Multiracial (please check all above that apply)
- Other (*Please Specify*): _____
- I would rather not report this

What is the highest level of education you have completed?

- 11^{th} grade or less (not high school graduate)
- High school graduate or G.E.D.
- Vocational or technical school after high school
- Some college, including 2 year degrees
- Bachelor's Degree
- Master's Degree
- Doctoral Degree (Ph.D., M.D., J.D., etc.)
- I would rather not report this

What is your Annual Household Income?

- ≤ 10,000
- $10,000-$14,999
- $15,000-$19,999
- $20,000-$24,999
- $25,000-$29,999
- $30,000-$39,999
- $40,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- $100,000-$149,999
- $150,000

What is your Annual Household Income?

Slider: 0-$150,000

APPENDIX B: TABLES

Table 1
Image Pilot Results

Image Name	Condition	Fitspiration strongly agree (%)	Health strongly agree (%)	Not Fitspiration (%)	Yes Fitspiration (%)	Not Health (%)	Yes Health (%)
Image 1	Control	4.2	8.3				
Image 2	Fitspiration	70.8	20.8	0	96	33	25
Image 3	Control	4.2	0				
Image 4	Health	25	62.5	54	29	4	92
Image 5	health	8.3	62.5	67	21	0	92
Image 6	Control	0	0				
Image 7	Fitspiration	83.3	25	4	92	50	33
Image 8	Fitspiration	79.2	12.5	8	92	54	38
Image 9	health	8.3	70.8	92	9	100	0
Image 10	Fitspiration	91.7	16.7	0	100	58	29
Image 11	health	8.3	54.2	79	21	0	96
Image 12	control	0	0				
Image 13	fitspiration	79.2	16.7	0	100	58	29
Image 14	health	41.7	41.7				
Image 15	control	0	0				
Image 16	health	25	29.2				
Image 17	fitspiration	91.7	20.8	4	96	67	29
Image 18	control	4.2	0				
Image 19	health	29.2	50	33	58	17	71
Image 20	control	0	0				
Image 21	fitspiration	58.3	16.7				
Image 22	health	29.2	45.8	33	50	17	75
Image 23	Control	0	0				
Image 24	health	4.2	20.8				
Image 25	health	37.5	41.7	25	63	17	71
Image 26	fitspiration	50	16.7				
Image 27	control	0	4.2				
Image 28	control	4.2	4.2				
Image 29	fitspiration	70.8	12.5	0	87	71	21
Image 30	health	20.8	54.2	63	29	0	88
Image 31	health	20.8	54.2	88	0	92	0
Image 32	fitspiration	87.5	20.8	0	96	58	29

Image 33	Control	4.2	0				
Image 34	fitspiration	33.3	20.8				
Image 35	health	8.3	50	58	29	4	83
Image 36	fitspiration	70.8	20.8	4	96	58	33
Image 37	control	0	0				
Image 38	fitspiration	70.8	12.5	0	96	58	29
Image 39	control	0	4.2				
Image 40	health	16.7	45.8				
Image 41	fitspiration	70.8	16.7	4	96	50	29
Image 42	control	0	0				
Image 43	control	4.2	0				
Image 44	health	20.8	37.5				
Image 45	fitspiration	79.2	12.5	0	100	71	21
Image 46	fitspiration	58.3	8.3				
Image 47	control	4.2	8.3				
Image 48	fitspiration	75	12.5	0	83	63	17
Image 49	health	8.3	58.3	71	21	0	96
Image 50	control	4.2	4.2				
Image 51	control	0	4.2				
Image 52	fitspiration	45.8	20.8				
Image 53	health	16.7	41.7				
Image 54	fitspiration	62.5	12.5	4	83	75	21
Image 55	control	0	0				
Image 56	fitspiration	62.5	12.5	4	92	63	21
Image 57	fitspiration	66.7	4.2	0	92	67	21
Image 58	health	25	54.2	54	29	8	79
Image 59	control	0	0				
Image 60	fitspiration	66.7	16.7	4	88	63	21
Image 61	health	25	70.8	58	25	4	92
Image 62	fitspiration	37.5	33.3				
Image 63	control	0	0				
Image 64	health	4.2	45.8				
Image 65	fitspiration	12.5	45.8				
Image 66	fitspiration	37.5	37.5				
Image 67	control	0	4.2				
Image 68	health	20.8	58.3	54	38	13	75
Image 69	fitspiration	29.2	37.5				
Image 70	control	4.2	4.2				
Image 71	health	20.8	58.3	58	25	0	88
Image 72	fitspiration	45.8	20.8				

Image 73	health	29.2	62.5	58	33	0	88
Image 74	control	4.2	0				
Image 75	health	12.5	45.8				
Image 76	control	0	0				
Image 77	health	16.7	58.3	67	21	4	67
Image 78	fitspiration	33.3	29.2				
Image 79	control	0	0				
Image 80	control	0	4.2				
Image 81	health	16.7	62.5	63	30	4	83
Image 82	fitspiration	62.5	16.7	4	88	63	33
Image 83	control	0	0				
Image 84	health	20.8	50				
Image 85	control	4.2	4.2				
Image 86	fitspiration	83.3	16.7	0	96	67	25
Image 87	health	41.7	33.3				
Image 88	health	37.5	41.7	33	54	25	67
Image 89	control	0	0				
Image 90	health	12.5	50	67	29	17	79

Note: All images were evaluated on the degree to which they strongly represented health and fitness. Only images that passed this first phase were evaluated on the remaining items

Table 2
Descriptive statistics of demographic variables

Variable	n	%	*M*	*SD*
Race				
White	167	75.2		
Black	25	11.3		
Native American	2	0.9		
East Asian	7	3.2		
Southeast Asian	12	5.4		
Latinx	6	2.7		
Biracial	2	0.9		
Age			36.73	11.31
21-29	67	30.3		
30-39	87	39.3		
40-49	34	15.6		
50-59	22	10.1		
60+	11	5.2		
Education				
11th grade or less	1	0.5		
High School graduate or G.E.D. (not currently in college/tech school)	8	3.6		
High School graduate or G.E.D. (currently in college/tech school)	2	0.9		
Some college, including 2 year degrees or Associate's degree	18	8.1		
Bachelor's Degree, not currently in grad school	74	33.3		
Bachelor's Degree, currently in grad school	52	23.4		
Master's Degree	59	26.6		
Terminal Degree (Ph.D., M.D., J.D., etc.)	7	3.2		
Income				
≤ 10,000	3	1.4		
$10,000-$14,999	12	5.4		
$15,000-$19,999	6	2.7		
$20,000-$24,999	17	7.7		

$25,000-$29,999	14	6.3
$30,000-$39,999	13	5.9
$40,000-$49,999	29	13.1
$50,000-$74,999	46	20.7
$75,000-$99,999	41	18.5
$100,000-$149,999	14	6.3
$150,000+	27	12.2
Sexual Orientation		
Exclusively heterosexual/straight	184	80.7
Mostly heterosexual, only incedentally homosexual/gay/lesbian	15	6.6
Equally heterosexual/straight and homosexual/gay/lesbian	12	5.3
Mostly homosexual/gay/lesbian, only incedentally heterosexual	6	2.6
Exclusively homosexual/gay/lesbian	5	2.2
Pansexual	2	0.9
Queer	2	0.9
Asexual: No socio-sexual contacts or reactions	2	0.9
Relationship Status		
Single	32	14.7
I am in a sexual, but non-romantic relationship	8	3.7
Casually dating	8	3.7
Exclusively dating	14	6.5
Engaged to be married	14	6.5
Married/Civil Union/Domestic Partnership	141	65

Table 3
Descriptive results of observed study variables

Variable	*M*	*SD*	Range-possible	Range-observed	Alpha if Deleted
1. SM time per day	2.51	0.92	0 - 4	1 - 4	0.035
2. Photo usage percent	55.26	31.02	0 - 100	0 - 100	0.06
3. Intentionality	5.26	1.69	0 - 8	0 - 8	0.69
4. BMI	25.93	5.47	n/a	15.62 - 46.93	0.65
5. Social Comparison	27.5	6.58	0 - 44	4 - 44	0.45
6. Weight Bias Internalization	42.88	14.52	11 - 77	16 - 74	0.40
7. Internalized Thin Ideal	27.96	7.46	9 - 45	9 - 45	0.43
8. Body Distress (Figure rating)	0.71	1.42	-8 - 8	-3 - 5	0.50
9. Obligatory Exercise Attitudes	50.19	10.45	20 - 80	23 - 70	0.38
10. Self-Esteem	21.51	5.46	4 - 40	10 - 40	0.34
11. Body Image Concerns	46.7	14.40	16 - 96	16 - 67	0.10

Table 4

Means, standard deviations and intercorrelation matrix of observed variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. SM time per day	2.51	0.92										
2. Photo usage percent	55.26	31.02	.29**									
3. Intentionality	5.26	1.69	.63**	.28**								
4. BMI	25.93	5.47	-0.13	-0.01	0							
5. Social Comparison	27.5	6.58	.24**	.14*	.37**	-0.01						
6. Weight Bias Internalization	46.52	14.24	.28**	.16*	.32**	.28**	.40**					
7. Internalized Thin Ideal	27.96	7.46	.31**	.25**	.36**	-0.02	.49**	.46**				
8. Body Distress (Figure rating)	0.71	1.42	- .34**	-.15*	-0.12	.34**	-0.05	-0.08	-0.11			
9. Obligatory Exercise Attitudes	50.19	10.45	.45**	.19**	.24**	-.23**	.24**	.34**	.34**	-.39**		
10. Self-Esteem	27.69	4.34	.30**	0.12	.31**	0.03	.31**	.66**	.34**	-.18**	.21**	
11. Body Image concerns	46.7	14.4	.31**	.16*	.34**	.18*	.40**	.74**	.45**	-0.05	.35**	.52**

* indicates significance at the p < .05 level
** indicates significance at the p < .01 level

Table 5
EFA matrix of study variables

	F1	F2	F3
Weight Bias	**0.914**		
Body Image concerns	**0.868**		
Self-Esteem	**0.775**		
Internalized Thin Ideal	**0.623**		0.465
Social Comparison Orientation	**0.614**		0.391
Body Distress		**0.803**	
BMI		**0.722**	
Exercise Attitudes	0.378	**-0.707**	0.315
SM Intentionality	0.459		**0.789**
SM Time per day	0.343	-0.427	**0.765**
Photo Engagement			**0.737**

Table 6
Descriptive results of observed study variables

Variable	*M*	*SD*	Range-possible	Range-observed
1. SM time per day	2.37	1	0 - 4	1 - 4
2. Photo usage percent	51.76	31.27	0 - 100	0 - 100
3. Intentionality	5.04	1.84	0 - 8	0 - 8
4. BMI	25.5	4.85	n/a	15.62 - 40.62
5. Social Comparison	27.03	7.16	0 - 44	4 - 41
6. Weight Bias Internalization	41.34	14.8	11 - 77	11 - 74
7. Internalized Thin Ideal	27.2	8.07	9 - 45	9 - 45
8. Body Distress (Figure rating)	0.88	1.43	-8 - 8	-3 - 4
9. Obligatory Exercise Attitudes	49.13	10.62	20 - 80	23 - 68
10. Self-Esteem	18.67	5.12	4 - 40	9 - 36
11. Body Image Concerns	49.13	10.62	16 - 96	16 - 76

Table 7
Means, standard deviations and intercorrelation matrix of observed variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. SM time per day	2.37	0.96										
2. Photo usage percent	51.76	31.27	.26**									
3. Intentionality	5.04	1.84	.62**	.22**								
4. BMI	25.49	4.85	-0.13	-0.01	-.01							
5. Social Comparison	27.03	7.16	.22**	0.11	.44**	-.06						
6. Weight Bias Internalization	41.34	14.79	.22*	0.09	.32**	.19*	.47**					
7. Internalized Thin Ideal	27.19	8.07	.27**	0.13	.33**	-.05	.57**	.54**				
8. Body Distress (Figure rating)	0.88	1.43	- .30**	-.03	-.09	.46**	0.01	-.03	-.06			
9. Obligatory Exercise Attitudes	49.13	10.62	.33**	0.05	.21*	-.30	0.16	.37**	.32**	-.36**		
10. Self-Esteem	18.67	5.11	.28**	0.04	.31**	-.09	.35**	.62**	.38**	-.20*	.27**	
11. Body Image Concerns	45/16	14.88	.26**	0.07	.32**	.22*	.43**	.71**	.50**	-.02	.37**	.56**

* indicates significance at the $p < .05$ level
** indicates significance at the $p < .01$ level

Table 8
Means, standard deviations and intercorrelation matrix of observed variables, post-hoc

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. SM time per day	2.37	0.96										
2. Photo usage percent	51.76	31.27	.26**									
3. Intentionality	5.04	1.84	.62**	.22**								
4. BMI	25.49	4.85	-0.13	-0.01	-.01							
5. Social Comparison	27.03	7.16	.22**	0.11	.44**	-.06						
6. Weight Bias Internalization	41.34	14.79	.22*	0.09	.32**	.19*	.47**					
7. Internalized Thin Ideal	27.19	8.07	.27**	0.13	.33**	-.05	.57**	.54**				
8. Body Distress	0.88	1.43	- .30**	-.03	-.09	.46**	0.01	-.03	-.06			
9. Exercise Attitudes	49.13	10.62	.33**	0.05	.21*	-.30	0.16	.37**	.32**	-.36**		
10. Self-Esteem	18.67	5.11	.28**	0.04	.31**	-.09	.35**	.62**	.38**	-.20*	.27**	
11. Body Image Concerns	45/16	14.88	.26**	0.07	.32**	.22*	.43**	.71**	.50**	-.02	.37**	.56**

* indicates significance at the p < .05 level
** indicates significance at the p < .01 level

APPENDIX C: FIGURES

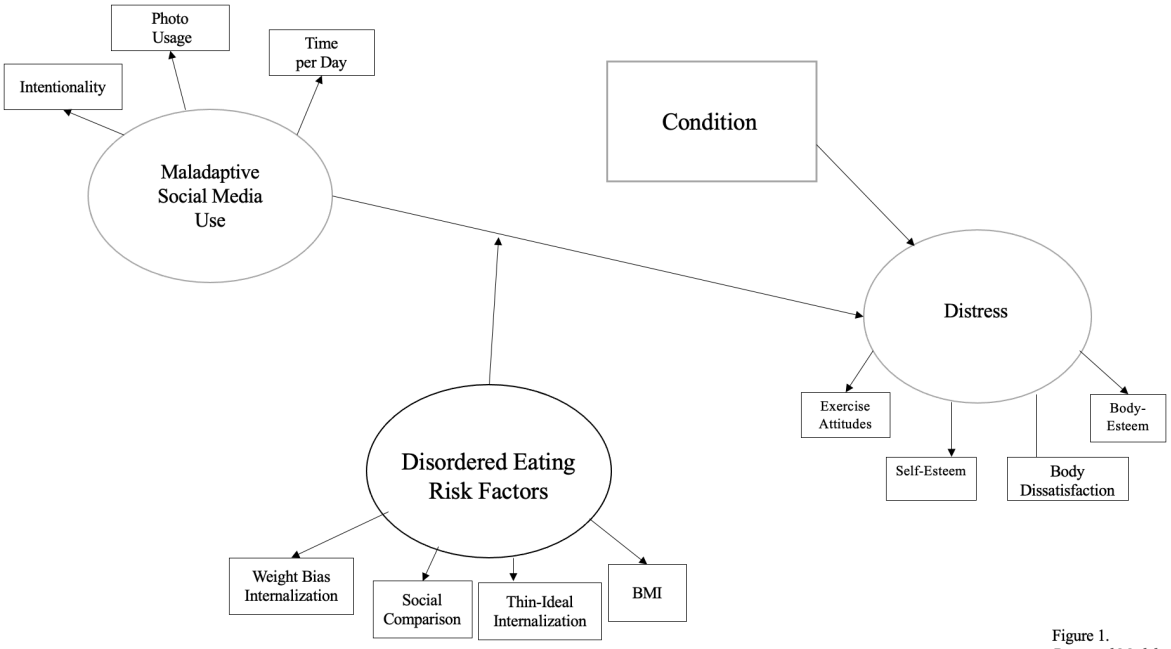


Figure 1.
Proposed Model

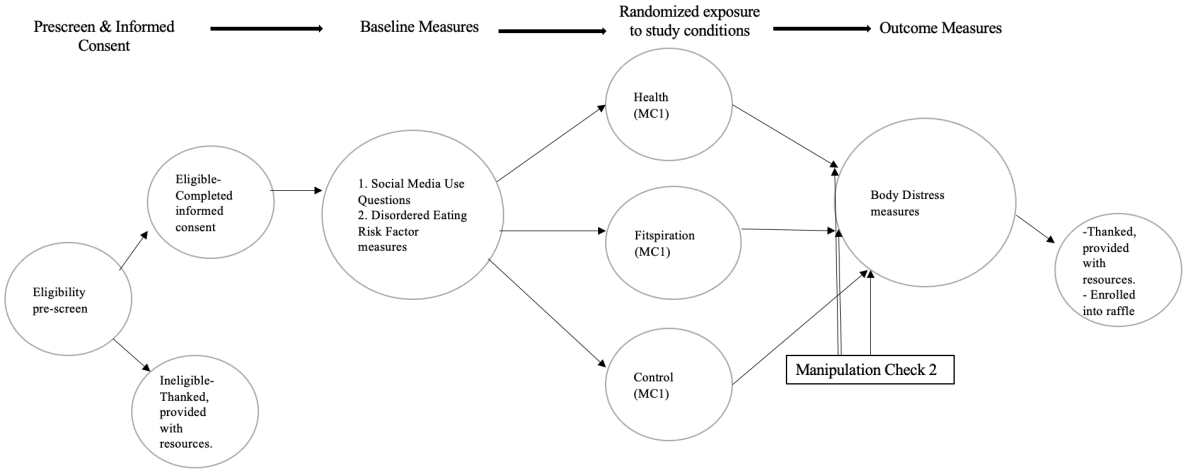


Figure 2.
Study flow

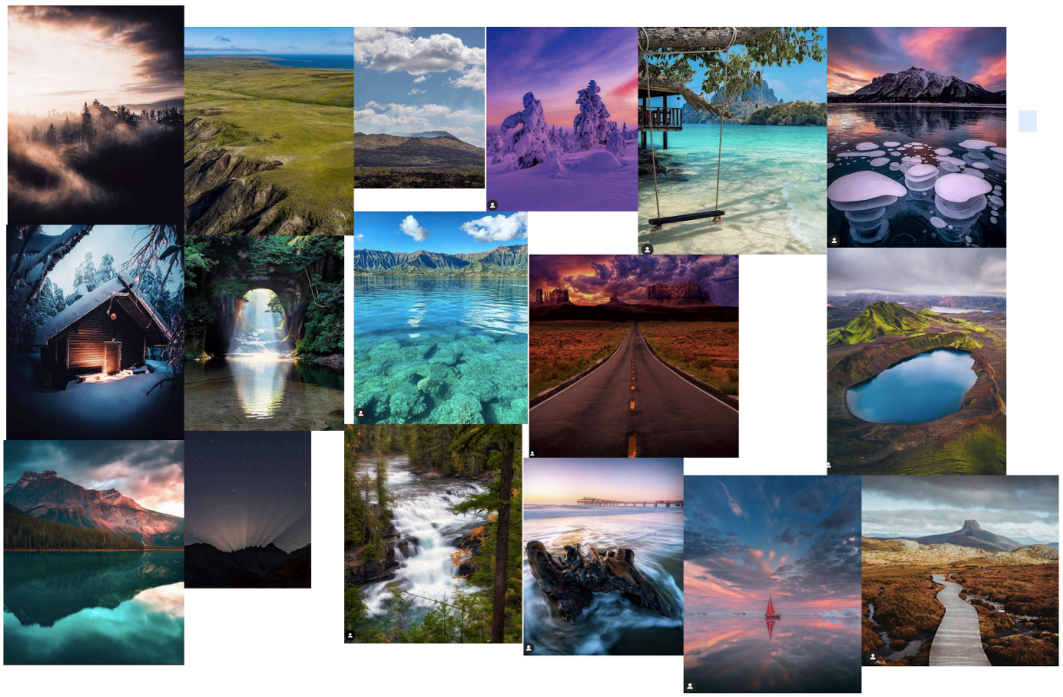


Figure 3.
Control images

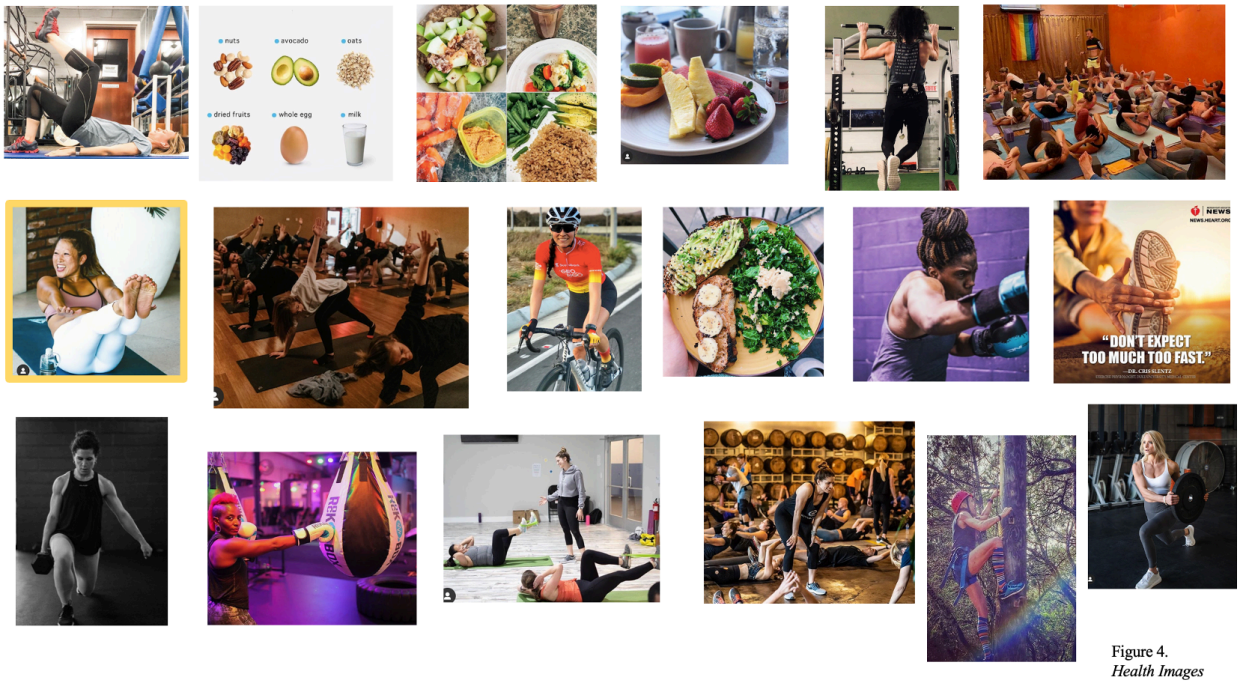


Figure 4.
Health Images

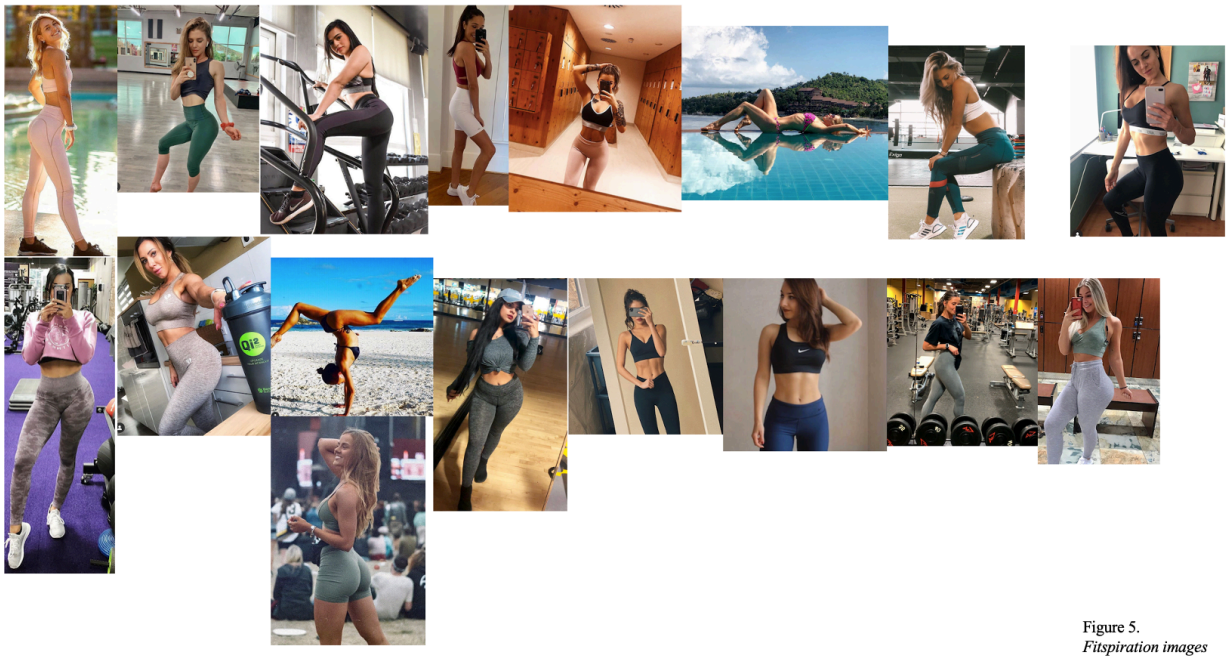


Figure 5.
Fitspiration images