Examination of a Brief, Self-Paced Online Self-Compassion Intervention Targeting Intuitive Eating and Body Image Outcomes among Men and Women

by

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Ideals for appearance and body image are pervasive in Western culture in which men and women are portrayed with unrealistic and often unattainable standards (Ferguson, 2013; Martin, 2010). Exposure and reinforcement have created a culture of social acceptance and internalization of these ideals, contributing to pervasive body image disturbance (i.e., body dissatisfaction; Fallon et al., 2014; Stice, 2001; Thompson & Stice, 2001; Thompson et al., 1999) and has been linked to numerous poor outcomes, including dieting, unhealthy weight control behaviors, disordered eating, and increased psychopathology. Intuitive eating is a non-restrictive approach to eating that encourages adherence to internal physiological cues to indicate when, what, and how much to eat (Tylka, 2006) and has demonstrated an inverse relationship with disordered eating, restrained eating, food preoccupation, dieting, body dissatisfaction, and negative affect (Bruce & Ricciardelli, 2016). Self-compassion, relating to oneself in a caring and supportive manner (Neff, 2003a), has been proposed as a pathway to increase intuitive eating and reduce body dissatisfaction (Neff & Knox, 2017; Schoenefeld & Webb, 2013; Webb & Hardin, 2016).

The current study compared a one-hour, self-guided online self-compassion intervention to an active control condition in order to examine the effectiveness of self-compassion and

intuitive eating among college men and women. The intervention was comprised of psychoeducation, experiential exercises, and mindfulness practice designed to increase self-compassion surrounding body image and eating behaviors. In contrast, the active control condition consisted of self-care recommendations and self-assessments for nutrition, exercise, and sleep. Overall, 1023 individuals (64% women, M_{age} = 18.9, 67.4% white) signed informed consent and participated in at least one part of the study whereas 101 participants (71% women, M_{age} = 19.3, 71% white) completed all three study portions.

As predicted, self-compassion was correlated with all variables of interest, and all study variables were correlated with each other ($p < .01$). In contrast to hypothesized outcomes, the self-compassion condition failed to demonstrate improvements across time or between conditions on all study outcomes. These results persisted when participants were screened for levels of intuitive eating as well. Contrary to prediction, internalized weight bias, muscle dysmorphia, and fear of self-compassion demonstrated increased levels within the intervention condition and decreases in the control condition. There were significant gender differences on multiple outcome variables, with men demonstrating higher levels of self-compassion and body appreciation whereas women endorsed higher levels of disordered eating, internalized weight bias, muscle dysmorphia, and psychological inflexibility. Additionally, there were significant gender interactions such that men demonstrated increased internalized weight bias and muscle dysmorphia across time whereas women displayed decreased weight bias and muscle dysmorphia. The opposite pattern was found within body appreciation; women demonstrated increased body appreciation across time while men reported decreased levels of body appreciation.

Finally, upon examining the moderating relationship of fear of self-compassion between self-compassion and outcome variables, there were main effects for self-compassion on intuitive eating, emotional eating, internalized weight bias, body appreciation, and psychological inflexibility as well as main effects of fear of self-compassion on psychological inflexibility. There were significant interactions for intuitive eating and emotional eating, such that as fear of self-compassion increased, the effect of self-compassion on intuitive eating decreased, and the effect of self-compassion on reducing emotional eating behaviors decreased.

Overall, the brief, self-paced online intervention delivered in the current study did not prove to be an effective means for improving self-compassion, intuitive eating, body appreciation, disordered eating, muscle dysmorphia, and psychological inflexibility. Nevertheless, the relationships between self-compassion and outcome variables of interest throughout the study mirror that of the existing literature. Findings from this study, in general, were also consistent with differences between men and women despite a gap in the research for intervention outcomes. Although fear of self-compassion demonstrated a moderating effect on the relationship between self-compassion and intuitive eating as well as emotional eating, this does not account for the lack of significant findings. The context surrounding this study, such as the COVID-19 pandemic, provided a considerable challenge to examining the efficacy of the current intervention. However, the findings of this study suggest future research will likely need to identify ways to enhance the delivery of experiential exercises that encourage engagement, provide a safe and warm environment for participants, and create flexibility and willingness surrounding painful and difficult experiences in order to undermine internalized and socially accepted beliefs about body image and eating behaviors.

EXAMINATION OF A BRIEF, SELF-PACED ONLINE SELF-COMPASSION INTERVENTION TARGETING INTUITIVE EATING AND BODY IMAGE OUTCOMES AMONG MEN AND WOMEN

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Introduction

Thin Ideal and Weight Stigma

The thin ideal of beauty and body image is pervasive in Western culture (Ferguson, 2013; Wolf, 1991). Images in the media abundantly portray men and women with thin or muscular physiques. Magazines, movies, and television shows overrepresent thin characters and underrepresent overweight characters (Fouts & Burggraf, 1999, 2000; Greenberg et al., 2003), with fashion models, cartoon characters, movie and television actresses, and beauty pageant winners becoming increasingly thinner in recent decades (Garner et al., 1980; Klein & Shiffman, 2005; Morris et al., 1989; Silverstein et al., 1986; Spitzer et al., 1999). In addition to thinness being overrepresented, thin bodies are often rewarded in media portrayals. An analysis of verbal reinforcers (e.g., "You look great! Have you lost weight?") directed at female television characters across 28 situational comedies (sitcoms) found that thin characters received the greatest amount of positive comments compared to average weight and overweight characters, with men providing significantly more positive comments than women (Fouts & Burggraf, 1999). These findings suggest that television provides messages to women whereby they learn that their appearance is highly valued and being thin is an important characteristic of attractiveness. While much of the literature on media influence on body image has focused on women and the thin-ideal, there is growing research that highlights the prevalence of unattainable body standards among men, particularly surrounding muscle ideals.

One area muscle ideals has been examined is changes in boys' action figures over time. For example, Pope and colleagues (1999) measured waist, chest, and bicep circumference of male action figures and compared scaled measurements using allometry (i.e., study of the relationship of body size and shape). They found that current action figures were consistently

more muscular than their predecessors, and the physiques were similar to that of advanced bodybuilders, with levels of muscularity often exceeding human attainment. The internet has provided an additional source of content for promoting body and appearance ideals. Analysis of pro-muscularity websites examined 421 webpages for thematic content and found that dietary and exercise rules, encouragement of the drive for muscularity, and promoting the benefits of muscularity accounted for over 75% of coded content (Murray et al., 2016).

According to cultivation theory, repeated exposure to television and media content contributes to acceptance of media portrayals as reality (Gerbner et al., 2002). Research by Lakoff and Scherr (1984) highlighted how models viewed in movies and television are viewed as realistic representations of actual people rather than carefully manipulated images. This is particularly problematic as models in the media are often portrayed with a body weight 15% below what is considered a healthy weight (Martin, 2010). Increased exposure to thin and muscular characters presents an ideal body image and level of attractiveness that becomes normal and expected, regardless of how unattainable.

Sociocultural models of body image attitudes have paid particular attention to awareness of the thin ideal in the media, internalization of the thin ideal, and perceived pressures to be thin (Stice, 2002; Thompson & Stice, 2001). It is argued that through social reinforcement, family, peers, and media perpetuate the thin-ideal through comments or actions (Thompson & Stice, 2001). For example, parental messages and peer-related teasing play a significant role in promoting the thin-ideal as well (Grabe et al., 2008). Further, expectations regarding the benefits of thinness, including increased social acceptance, are posited to lead to internalization of this ideal (Hohlstein et al., 1998). Although awareness of the thin ideal predicts body image, not

surprisingly, indicators such as internalization of the thin ideal and perceived pressures to be thin are significantly stronger in predicting body image attitudes (Cafri et al., 2005).

Thin ideal internalization is the result of individuals internalizing attitudes that are approved and socially accepted by significant or respected others (Kandel, 1980). Internalization of the thin body ideal occurs when individuals endorse or accept socially defined standards of attractiveness and subsequently engage in behaviors to achieve such ideals (Thompson et al., 1999). Thin-ideal internalization has been associated with numerous adverse outcomes including body dissatisfaction, negative affect, and eating pathology (Killen et al., 1996; Stice, 2001). Research by Heinberg, Thompson, and Stormer (1995) indicated that internalization of socially accepted body ideals and appearance provide a prominent pathway for the development of body dissatisfaction and disordered eating. More specifically, internalization of the thin-ideal is suggested to cultivate body dissatisfaction because the ideal is virtually unattainable (Thompson et al., 1999). According to the dual-pathway model, elevated social pressure to be thin fosters body dissatisfaction, potentially due to discontent with one's body stemming from repeated messages that one is not thin enough (Stice, 2001). Inability to conform to the socially acceptable thin-ideal leads to the development of body dissatisfaction as well as future dieting behaviors directed at altering one's body, often referred to as the drive for thinness. These relationships have been confirmed by various studies (Dalley, 2016; Dondzilo et al., 2018; Levitt, 2003; Rodgers et al., 2018).

Experimental research has compared ideal images of female attractiveness commonly found in women's magazines to neutral images in similar magazines (e.g., household products; Henderson-King & Henderson-King, 1997). Women exposed to the ideal images reported higher levels of self-monitoring and weight concern. Moreover, they found that women with a higher

BMI felt less positive compared to women with a lower BMI suggesting that the images may have triggered comparisons between participant BMI and thin ideals. Similar research conducted with undergraduate men found that exposure to muscular male figures, relative to exposure to neutral images, produced significantly greater body dissatisfaction as measured by the increased difference between their perceived level of muscularity and ideal level of muscularity (Leit, et al., 2001). Similar to how thin-ideal internalization is positively correlated to a drive for thinness, muscularity internalization is positively correlated with a drive for muscularity (Schaefer et al., 2017). In fact, viewing muscular images in the media has been shown to be a strong predictor of increased body dissatisfaction and drive for muscularity (Arbour & Ginis, 2006), suggesting that internalization of media-driven body ideals may be fueling this discontent (Daniel & Bridges, 2010).

Similar to body and appearance ideals, internalization of weight stigma has been shown to contribute to body dissatisfaction as well. Weight stigma, also known as weight bias or weight-based discrimination, is discrimination or stereotyping based on a person's weight or negative attitudes toward someone because of their weight (Puhl & Brownell, 2006). Weight stigmatization occurs across a variety of domains and encompasses overt criticism and comments, indirect stigma, such as ridiculing other overweight individuals in the presence of a person with overweight, and environmental cues, including lack of adequate size seating or clothing (Lewis et al., 2011; Puhl & Brownell, 2006; Sikorski et al., 2015). Therefore, not only is thinness idolized, but excessive weight is also maligned. For example, negative stereotypes and criticisms include perceptions that people with overweight or obesity are mean, stupid, ugly, lazy, sloppy, and lacking in self-discipline, willpower and motivation (Brylinskey & Moore, 1994; Crandall, 1994; Teachman et al., 2003). As with the thin-ideal, the pervasiveness of weight

stigma has contributed to the internalization of these culturally acceptable anti-fat attitudes. Internalized weight bias refers to self-directed stereotypes and beliefs about weight (Durso & Latner, 2008) and has been conceptualized as negative body image-related affect/cognitions (Webb & Hardin, 2013) in which stigmatizing attitudes become self-directed. Internalization of stigmatizing attitudes about weight have been shown to correspond to numerous psychosocial consequences, including body image disturbance (e.g., body shame, body dissatisfaction, fear of fat, weight concerns), drive for thinness, and maladaptive eating behaviors (e.g., binge eating, emotional eating, food addiction, poor eating-related self-efficacy; Burmeister et al., 2013; Carels et al., 2010, 2013; Durso & Latner, 2008, Durso et al., 2012; Pearl & Puhl, 2014; Roberto et al., 2012). Thus, these stigmatizing attitudes about weight become self-directed criticisms. Further, Pearl and Puhl (2014) have suggested that self-directed weight stigma and blame cut across weight categories and is related to psychopathology among men and women regardless of weight status. Thus, not only do portrayals of thin and muscular ideals lead to internalization of unattainable standards and subsequent body image disturbance, pressure from others, including the content of those messages, contribute to body dissatisfaction.

Body Dissatisfaction

As indicated above, research suggests that, through increased exposure to body-ideals (Dittmar et al., 2006) and normalization through societal reinforcement (Stice, 2001), internalization of appearance ideals is regarded as a causal factor in the development of body image concerns among men and women (Cahill & Mussap, 2007). Body image concerns, or body dissatisfaction, refers to a negative evaluation of one's body that involves a perceived discrepancy between an individual's assessment of his or her actual and ideal body (Cash & Szymanski, 1995). Estimates of body dissatisfaction vary depending on the measurement tool

and cut-off protocol chosen. A systematic review of the literature from 1973 to 2009 presented a range of body dissatisfaction of 11-72% for women and 8-61% for men, estimates of weight dissatisfaction from 46 to 66% for women and 35 to 52% for men, and estimates for dissatisfaction with overall appearance from 23 to 56% for women and 15 to 43% for men (Fiske et al., 2014). More recent research provided a range of body dissatisfaction among women from 13.4 to 31.8% and from 9.0 to 28.4% for men (Fallon et al., 2014). Although body dissatisfaction occurs regardless of size, research has shown that increased BMI is associated with increased body dissatisfaction (Sarwer et al., 2005).

Body dissatisfaction is less frequently observed among men compared to women (Dany & Morin, 2010; Furnham & Calnan, 1998), and women are more likely to report concerns about their weight and shape than men (Buchanan et al., 2013). Nevertheless, as previously noted, body image disturbance is also prevalent among men, yet concerns are often expressed differently across genders. Accordingly, separate models for men and women have been developed in order to highlight the development of body dissatisfaction. As described below, the divergence of these models lies in the attention of thin ideals among women and muscular ideals among men. It should be noted, however, that some men desire a slender, rather than muscular physique (Hildebrandt et al., 2006), and some women desire a muscular, as opposed to a thin body (Gruber, 2007).

For women, according to the tripartite influence model (Figure 1), social influence from peers, parents, and the media provide a direct effect on body dissatisfaction in women (Thompson et al., 1999a; Thompson et al., 1999b). Additionally, teasing (i.e., social influence) indirectly impacts internalization of the socially accepted body ideal as well as appearance comparison. In turn, body dissatisfaction predicts restricted eating and directly contributes to

disordered eating behaviors (e.g., bulimia). A meta-analysis of experimental and correlation studies provided strong support for the link between the depiction of the thin-ideal body in the media and women's increased propensity for body image disturbance (Grabe et al., 2008). Specifically, media exposure was positively related to internalization of the thin-ideal, body dissatisfaction, increased investment in appearance, and eating behavior and beliefs.

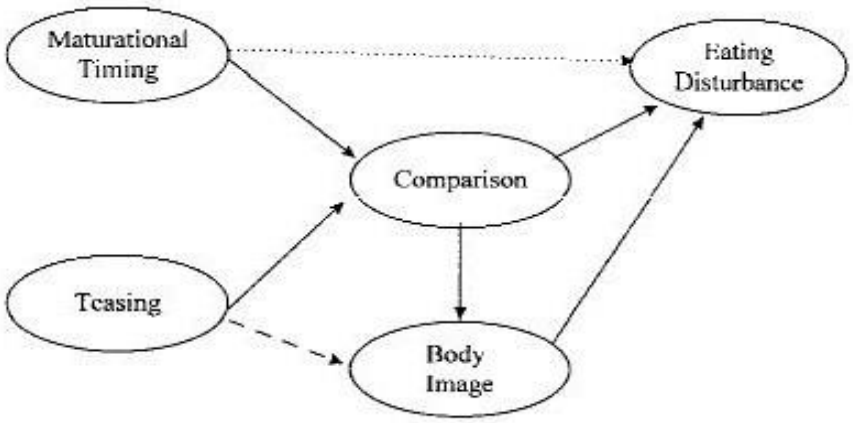


Figure 1. Tripartite influence model of body dissatisfaction in women (Thompson et al., 1999).

Tylka (2011) applied the tripartite influence model to capture body dissatisfaction among men. The model was expanded to be "quadripartite" to fit the data (Figure 2). Specifically, it was found that muscularity dissatisfaction predicted muscularity enhancement behaviors (e.g., excessive weight training and considering steroid use), and body fat dissatisfaction predicted disordered eating behaviors (e.g., increased dieting and food preoccupation). Further, internalization of the mesomorphic ideal (i.e., muscularity and thinness internalization), muscularity dissatisfaction, and body fat dissatisfaction mediated the relationship between social pressure and men's body change behaviors (i.e., disordered eating and muscle enhancement behaviors). Romantic partner pressure was also included in the model and showed a direct

relationship with disordered eating behaviors, suggesting men may alter their eating, perhaps, if in the presence of a partner who is critical of their appearance.

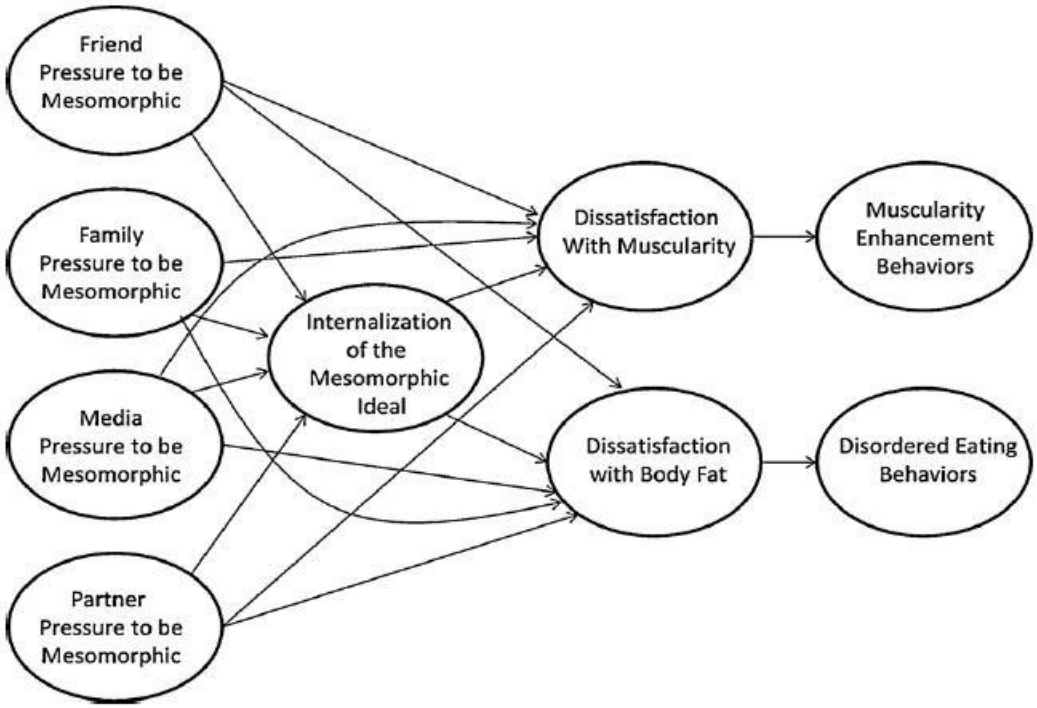


Figure 2. "Quadripartite" influence model of dual image pathways to men's body dissatisfaction (Tylka, 2011).

Among men, muscularity internalization and thinness internalization are independently and positively associated with muscle dysmorphia (Klimek et al. 2018). Muscle dysmorphia, a form of body dissatisfaction thought to be more common in men, consists of preoccupation with muscularity and a low degree of body fat (i.e., mesomorphic ideal; Pope et al., 1997). As levels of thinness internalization decrease, muscularity internalization increases, suggesting men who pursue the muscularity ideal, compared to those who pursue the thin ideal, may be at a greater risk of muscle dysmorphia (Klimek et al., 2018). Additional research examining body image perception among weightlifting men in three Westernized countries found that they would prefer to have a body with at least 27 lbs. more muscle than they actually had (Pope et al., 2000).

Participants expressed beliefs that women preferred the more muscular physique, although the authors indicated women preferred an "ordinary" male body.

Although it has been argued that body dissatisfaction may encourage or promote healthy weight management behaviors (Heinberg et al., 2001), the data do not appear to support this conclusion. A five-year longitudinal study examined the relationship between body image and health-related behaviors among adolescents (Neumark-Sztainer et al., 2006). It was found that lower levels of body satisfaction were related to more health-compromising behaviors (e.g., binge eating) and unhealthy weight control behaviors (e.g., fasting, skipping meals, or smoking more cigarettes) as well as fewer health-promoting behaviors (e.g., physical activity). Lower levels of body satisfaction at baseline predicted higher levels of dieting, unhealthy and very unhealthy weight control behaviors (e.g., purging behaviors), and binge eating in both males and females at the end of the study. Moreover, body dissatisfaction has been linked to numerous adverse health behaviors, including reduced likelihood of cancer screening self-exams (Ridolfi & Crowther, 2013), decreased success in smoking cessation (King et al., 2005), lower health-related quality of life (Wilson et al., 2013), and decreased mental health and sexual functioning (Davison & McCabe, 2005).

In short, the link between body image and eating behaviors is well-documented (Parent & Moradi, 2011; Shroff & Thompson, 2006; Thompson & Stice, 2001; Tylka, 2011). Body perceptions are likely to contribute to efforts to engage in behaviors that are directed toward altering one's outward appearance (e.g., diet and exercise). Moreover, there are numerous psychological consequences related to the incongruence between body image and efforts to change one's outward appearance, including low self-esteem (Puhl & Heuer, 2009; Thompson et al., 1999) and increased stress as well as anxious and depressive symptomology (Puhl & Heuer,

2009; Wilson et al., 2013). As such, interventions have been developed in order to address body image disturbance.

Body Image Interventions

Numerous interventions have been designed to improve body image in light of the associations between body dissatisfaction, psychological problems and unhealth behaviors. The most prevalent interventions include fitness training, media literacy, self-esteem enhancement, psychoeducation, and cognitive-behavioral therapy (CBT; Alleva et al., 2015). Fitness training is comprised of aerobic and anaerobic exercises to improve physical abilities (e.g., muscle strength). Media literacy interventions teach individuals to evaluate and challenge images and messages portrayed in the media that contribute to body dissatisfaction. Self-esteem enhancement targets feelings in overall worth that are proposed to improve body image. Psychoeducation provides information about issues related to negative body image including its causes and consequences. Lastly, CBT interventions are the most prominent and target dysfunctional thoughts, feelings, and behaviors that contribute to body dissatisfaction. Techniques include self-monitoring, cognitive restructuring, and exposure exercises.

A meta-analysis examined the effectiveness of 62 stand-alone body image interventions (Alleva et al., 2015). After correcting for publication and sample size bias, interventions demonstrated small effect sizes on improvements in body image, but negligible effects on internalization and social comparison tendencies. The authors also sought to determine specific change techniques that were most effective at improving body image. They found that altering language about body image, including the role of cognitions, monitoring, and restructuring, as well as guided imagery, exposure exercises, and stress management were effective techniques to

improve body image. Self-esteem, physical fitness, and discussing individual differences were contraindicated and associated with poorer outcomes.

More recently, a meta-analysis examined effects of third-wave behavioral interventions on eating disorder risk factors (e.g., body image and disordered eating; Linardon et al., 2019). Related to body image and eating behavior, third-wave CBT interventions attend to how individuals interact with their thoughts around weight, shape and eating, increasing acceptance, mindfulness and psychological flexibility while reducing experiential avoidance and thought suppression (Hayes, 2004). Among 24 studies, including 13 randomized control trials, pre-post effect sizes were medium (g's = 0.59) for disordered eating and small (g's = 0.48) for body image (Linardon et al., 2019). Despite the potential for interventions to address body dissatisfaction, dieting efforts continue to be widespread. Due to its proposed effectiveness as a weight-control technique, greater effort is spent on dieting and dieting-related activities to help reduce body dissatisfaction (Thompson & Stice, 2001).

Dieting and Weight Loss

While individuals may desire to lose weight for a variety of reasons (e.g., thinness, improve appearance, improve or prevent health issues; Calder & Mussap, 2015; Putterman & Linden, 2004), it has been argued that many individuals engage in weight loss efforts in order to reduce the distress stemming from the discrepancy between their current or perceived body image and idealized body standards (Thomspon & Stice, 2001). Additionally, over 70 percent of Americans aged 20 years and older are overweight, with obesity exceeding 35 percent in most sex and age groups (Flegal et al., 2010). In part, because of the obesity epidemic, and in part, because of the socially reinforced body ideals, there are abundant and often competing resources available to alter, substitute, or restrict foods through dieting and other weight loss methods. In

fact, the weight loss industry produces approximately $60 billion in revenue annually (Bacon & Aphramor, 2011). A 2012 national sample indicated that 46% of women and 33% of men were currently engaged in weight loss efforts (Bish et al., 2005).

Prior to examining the research on dieting and weight loss outcomes, it is important to note that the approaches to dieting and weight loss can vastly differ. In fact, some researchers have attempted to make conceptual distinctions between dieting and weight loss. Dieting refers to any modification to food consumption that is intended to change one's body composition (e.g., weight, size, or adiposity; McFarlane et al., 1999). This involves alterations to when, what, and how much a person eats. Moreover, diets are time limited and are often not sustained, evidenced by high failure rates and frequency of weight cycling (i.e., repeated diet attempts; Markey, 2014). In contrast, weight management is a more inclusive and holistic term that emphasizes dietary behaviors, physical activity, social support, stress management, etc. Weight management is not solely related to dieting, rather it is "an ongoing lifestyle that includes long-term changes in daily eating and exercise habits" (Markey, 2014, p. 5). Further, weight management is a lifelong endeavor that contrasts greatly with the rapid results and short-term benefits associated with dieting (Tribole & Resch, 2012). Regardless of definitions, it is clear that dieting and weight loss encompass a variety of methods, healthy and unhealthy, ranging in duration from days to months to years.

Dieting and weight loss definitions aside, prospective studies since the 1990s have consistently demonstrated a link between dieting to lose weight and future weight gain and obesity (Dulloo et al., 2015). These findings hold true even after controlling for baseline BMI, age, and other lifestyle and behavioral characteristics. For example, Stice and colleagues conducted a three-year longitudinal study of naturalistic dieting, exercise, radical weight loss

efforts, and binge eating in relation to weight and onset of obesity in a female adolescent sample (Stice et al., 1999). They found that self-labelled dieters as well as increased dietary restraint and exercise for weight loss predicted an increased likelihood of obesity over three years relative to nondieters. Analyses controlled for BMI, suggesting that elevated weight loss efforts were more likely to lead to weight gain. Furthermore, research has highlighted that greater dieting attempts, particularly for those with higher BMI, experience the largest weight gain over time (Pietiläinen et al., 2012).

A systematic review by Lowe and colleagues highlighted that dieting and restrained eating do not predict better weight control (i.e., weight loss or less weight gain; Lowe et al., 2013). In fact, they found that 75% (N = 20) of analyses found dieting behaviors were predictive of future weight gain. The authors concluded that dieting at one point in time may predict future weight gain, although causality is difficult to determine due to the correlational nature of the data. Additionally, a five-year longitudinal study of dieting for weight loss among young-adults found individuals who dieted were consistently heavier and had larger waist circumferences compared to those who did not engage in a diet attempt (Keski-Rahkonen et al., 2005). Likewise, the authors suggested that strict eating behaviors during weight loss attempts may have resulted in higher BMI as well as the potential for higher BMI individuals to alter their eating habits. Of course, individuals who are already gaining weight may be more likely to engage in dieting behaviors than those not on a weight gain trajectory (Lowe & Levine, 2005). However, regardless of causality, dieting methods that people are using to lose weight have been largely ineffective.

Earlier research has implicated perceived deprivation and preoccupation with food as psychological consequences of dieting and perhaps contributors to their ineffectiveness (Polivy

& Herman, 1993). Food preoccupation refers to the amount of time spent thinking about food or eating (Fairburn & Cooper, 1993). Perceived deprivation, the feeling of dissatisfaction with the amount or type of food consumed, has been posited as a barrier to long-term weight loss (St. Jeor et al., 1993) and has been reported in chronic, restrained dieters who experience short-term restrictions in dietary intake, including enjoyable and favorite foods (Polivy, 1996). Restrained eating refers to conscious restriction of food intake and calories in order to lose weight and prevent weight gain below one's biologically appropriate level (Lowe, 1993). Restrained eaters have demonstrated recurrent dieting attempts, often demonstrating minimal weight loss, and display eating and food behaviors similar to actual food deprivation. Research using a 14-day food diary among adult women found that dieting patterns of weight cycling and dietary restraint, not daily caloric and fat intake, were related to perceived deprivation (Timmerman & Gregg, 2003). The authors concluded that perceived deprivation may occur when an individual eats less than usual, less than desired, or does not eat a specific desired food. Dietary restraint was also shown to be the best predictor of preoccupation with food (Timmerman & Gregg, 2003). Dieting, in which caloric restriction typically does occur, ultimately may not be conducive to weight loss and provides the necessary conditions for psychological deprivation and preoccupation with the foods individuals feel they are not able to eat.

Although dieters have demonstrated successful restriction of food intake in laboratory studies (Lowe, 1993, 1995), an underlying propensity to consuming excess calories and gaining weight is likely to override short-term dietary control (Lowe et al., 2013). Restricted eating during weight loss attempts may lead to increased sensation of hunger and overeating as a physiological response to replenish energy stores (Pietiläinen et al., 2012). This response appears to be elevated in diets comprised of severe restriction as well as perceived and actual deprivation,

resulting in overeating, food binges, and poor weight maintenance. In the classic 1945 Minnesota Starvation Study, normal weight men were restricted to half of their caloric needs for six months leading to a 25% loss of total body weight (Keys et al., 1950). During the rehabilitation period, the participants demonstrated severe preoccupation with food and engaged in overeating. Similar attitudes towards food have been reported in an obese sample, including uncontrolled appetite, food binges, nighttime eating, and eating when not hungry but for pleasure (Swanson & Dinello, 1970). Perceived deprivation and preoccupation with food stemming from certain overly restrictive approaches to dieting seems to have far-reaching consequences for weight status.

Restricted eating during dieting, although successful short-term, appears to increase the likelihood of a calorie surplus and subsequent weight gain. A five-year longitudinal study found that individuals engaging in weight loss attempts exhibited greater restricting, overeating, and alternating restricting/overeating than those who did not attempt weight loss (Keski-Rahkonen et al., 2005). These individuals were also more likely to eat in response to visual and emotional cues and demonstrated greater weight gain overtime. Moreover, the three-factor model of dieting behavior suggests that overeating in restrained eaters is related to their history of dieting and overeating rather than current dietary restraint (Lowe, 1993). In other words, previous dieting behaviors are more predictive of current behaviors as opposed to motivations for weight loss. Lowe (1993) argues that this cycle of dieting and overeating plays a causal role in disinhibitory eating, a breakdown of the control normally exerted during restrained eating, which contributes to oscillating periods of undereating during the diet phase and overeating during the relapse stage. The increased risk to disinhibitory eating is suggested to contribute to failed dieter's attention to external and emotional cues to eat, rather than physiological ones, leading to a susceptibility to overeating during emotional distress and the likelihood of future dieting.

Repeated dieting attempts and weight cycling provides a substantial risk for progressive weight gain over time (Dulloo et al., 2015). Longitudinal research has demonstrated a dose-dependent relationship between dieting attempts and weight gain such that individuals who engage in more attempts have a higher BMI (Pietiläinen et al., 2012). In fact, weight regain following dieting attempts has been suggested as an inevitable response to the obesogenic environment that encourages consumption of large quantities of foods that are high in fat and sugar (Wadden et al., 2004). Moreover, dietary control is likely to be thwarted by the abundance of calorically dense and nutrient sparse foods and beverages. Therefore, it is clear that current approaches to weight management that involve excessive restriction are likely to fail because of a number of internal and environmental factors.

While the mechanisms are still being discovered, studies have shown that, following a period of calorie restriction, fat overshooting occurs in which the amount of weight lost is exceeded by the fat regained (Dulloo et al., 2015. After weight regain, desynchronization between the body's restoration of fat and free-fat mass (FFM) leads to hyperphagia (i.e., increased appetite and overeating) until complete recovery of FFM. In the event that overshooting does not lead to net weight gain (i.e., additional weight from baseline), the asymmetry between adipose tissue (i.e., fat) and FFM restoration leads to a disproportionately higher replenishment of fat storage that alters body composition relative to baseline (Dulloo et al., 2002). In other words, the weight that is gained back is stored predominantly as fat rather than muscle. Subsequently, this change in body composition means the body now has fewer metabolizing cells that require energy and nutrient demands than prior to engaging in weight loss. This change in body composition creates a challenging situation in which energy expenditure is likely to decrease while energy consumption is maintained or perhaps increased.

Thus, individuals are more susceptible to future weight gain. Fat overshooting has been demonstrated in numerous studies in which participants undergo restricted energy intake (i.e., calorie deficit) to induce weight loss followed by refeeding and subsequent weight and fat gain (Benedict, 1907, 1919; Friedl et al., 2000; Keys et al., 1950; Nindl et al., 1997; Young et al., 1998).

Because of many of the shortcomings to dieting listed above, substantial effort has been placed on identifying effective and efficient weight loss interventions to address the growing obesity epidemic. Behavioral weight loss interventions are considered the gold standard for the treatment of overweight and mild to moderate obesity (Wing & Phelan, 2005). Interventions are traditionally delivered in a group format and led by a trained health professional. Weight loss targets include dietary and physical activity prescriptions as well as cognitive-behavioral techniques such as stimulus control, goal setting, contingency management, and cognitive techniques (e.g., thought traps). A systematic review of 80 clinical weight loss trials found that interventions resulted in a mean weight loss of approximately 5% to 9% of total body weight 6-months after baseline (Franz et al., 2007). Although behavioral weight loss interventions have shown efficacy for some individuals, the reach of these methods is limited. Approximately 30 to 35% of weight is regained in the first year following behavioral weight loss interventions whereas 50% or more of patients are likely to have returned to their baseline weight in five years (Wadden et al., 2004). These findings suggest that many participants in well-controlled weight loss interventions evidence a propensity to weight regain shortly after treatment ends, raising the question of whether long-term weight loss is possible for most individuals.

Future research is greatly needed to develop additional approaches to enhance weight loss that are not overly restrictive and enhance weight loss maintenance. It has become abundantly

clear that a combination of body image disturbance, a toxic food environment, and ineffectual and overly restrictive attempts to lose weight predispose a large portion of the population to future weight gain, weight cycling, and obesity (Dulloo et al., 2015). Unfortunately, multiple unsuccessful dieting attempts may lead to more drastic and unhealthy behaviors in order to lose weight. In fact, dieting has been found to strongly predict the onset of binge eating, extreme weight control behaviors, and eating disorders five years later (Neumark-Sztainer et al., 2006). Weight gain in response to failed dieting attempts as well as internalization of ideal body standards can lead to body dissatisfaction, a prominent risk factor in the development and maintenance of disordered eating behaviors (Stice & Shaw, 2002), including anorexia nervosa, bulimia nervosa, and binge eating disorder (Stice et al., 2011) as well as increased emotional distress and diminished quality of life (e.g., depression and anxiety; Szymanski & Henning, 2007; van den Berg et al., 2007). As noted earlier, theoretical models have proposed that body dissatisfaction stemming from thin-ideal internalization increases dieting and negative affect which subsequently enhances the risk of disordered eating behaviors (Stice, 2001). Research from prospective and longitudinal designs has confirmed this relationship and identified body dissatisfaction as one of the most consistent and robust risk factors for eating disorders, such as bulimia, and as a significant predictor of low self-esteem, depression, and obesity (Grabe et al., 2007; Johnson & Wardle, 2005; Neumark-Sztianer et al., 2006; Paxton et al., 2006; Tiggemann, 2005).

Disordered Eating

Engaging in healthy eating behaviors is important to maximize health and prevent disease. However, maintaining optimal eating habits can be particularly challenging in today's culture in which there is an abundance pressure to conform to ideal body standards as well as

contradicting recommendations and suggestions regarding dietary behaviors. These factors likely coincide with the development of destructive attitudes toward food and body weight as well as unhealthy eating habits (Quick et al., 2013). Such behaviors are likely magnified following weight cycling and repeated failed weight loss attempts. Eating disorders are defined as behavioral or psychological patterns related to eating and weight associated with distress, disability, or with increased risk of morbidity or mortality (Grilo, 2006). The prevalence rates of eating disorders range from 2 to 3% (Keski-Rahkonen & Mustelin, 2016).

While diagnosable eating disorders are relatively rare, many people engage in sub-threshold disordered eating behaviors. Disordered eating behaviors are abnormal eating behaviors often associated with eating disorders, including restrained eating, emotional eating, disinhibited eating, binge eating, external eating, inappropriate compensatory behaviors (e.g., purging), and weight, shape and eating concerns (American Psychiatric Association, 2000). Although disordered eating behaviors do not meet criteria nor warrant a diagnosis of an eating disorder recognized by the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM),* subthreshold eating behaviors are often marked by physical and psychosocial impairment and distress. These impairments are also masked by the normative and culturally reinforced nature of these behaviors that allow these behaviors to persist (Hesse-Biber et al., 2006). Disordered eating behaviors are significantly more prevalent than eating disorders, occurring in over 40% of females and over 20% of male young adults (Goldschmidt et al., 2018). Researchers have recently begun to examine disordered eating behavior as its own clinical phenomena which shares common components with eating disorders such as negative affect and body dissatisfaction (Stephen et al., 2014). Further, the occurrence of disordered eating behaviors

provides a significantly increased likelihood of developing an eating disorder compared to nonrestrictive eating behaviors (Golden et al., 2016).

Research has indicated that overeating and subclinical binge eating in adolescents are associated with higher BMI and obesity status as well as more frequent dieting attempts (after controlling for BMI) and increased emphasis on the importance of weight and shape (Ackard et al., 2003). It is unsurprising that consuming additional or excess calories is related to increased weight status and greater body image concerns; however, it is important to note that overeating predicts future dieting. The relationship between subclinical binging episodes and dieting appears to be cyclical, such that diet attempts may lead to overeating due to perceived deprivation, followed by additional weight loss attempts. The oscillation between dieting and overeating poses additional concerns for compensatory behaviors. In fact, there is an elevated risk of purging behaviors (e.g., vomiting, laxative use) with dieting due to binge episodes directed at counteracting the perceived deprivation during dieting (Thompson & Stice, 2001). Further, Stice and colleagues (1999) identified incidental exercise, use of appetite suppressants, binge eating, and purging behaviors as prospective predictors of greater growth in relative weight over a five-year period. Researchers have suggested that the relationship between dieting, overeating, and elevated weight status may be due to a "chaotic pattern" of weight loss attempts, feelings of deprivation and overhunger, loss of control, binge eating, and subsequent dieting attempts, consistent with restraint theory (Ackard et al., 2003).

A substantial portion of the disordered eating literature has been dedicated to understanding restrained eating. Pressure to conform to cultural and social expectations related to an ideal body and weight have been posited to increase the likelihood of restrictive eating habits despite internal signals to do otherwise (Herman & Mack, 1975). Janet Polivy (1996), who has

spent most of the last several decades studying dieting behaviors, referred to restrained eating as a personality trait essential to chronic dieting and used this term interchangeably with dieting. Although restrained eating would be expected to reduce one's weight, restraint is, in fact, related to weight gain and BMI (Hays & Roberts, 2008). Additional research found a relationship between higher levels of restraint and increased BMI as well as disordered eating behaviors compared to adaptive eating and individuals lower in restraint (Anderson et al., 2016). Moreover, restrained eaters are more prone to episodes of overeating compared to unrestrained eaters (Polivy, 1996). A five-year study examining adolescent dieting found that disordered eating behaviors (e.g., fasted, ate very little food, used a food substitute, skipped meals, took diet pills, or engaged in purging behaviors) predicted weight gain, overweight status, future disordered eating, and clinical eating disorders (Neumark-Sztainer et al., 2006). Although restrained eating and other weight control behaviors may appear to be beneficial for regulating one's weight in the short-term, they are likely to have detrimental effects long-term and appear to be counterproductive to weight management.

Restrained eating has also been implicated in ignoring internal hunger signals to eat less than one typically would in pursuit of weight loss (Polivy, 1996). This presents a vulnerability to eating in response to alternative cues, both internal and external. Related to internal signals, there is an abundance of research highlighting the connection between emotions and eating behaviors. The physiological effects of emotional distress coincide with inhibition of gastric contractions and elevation of blood sugar designed to suppress hunger (Herman et al., 1987). Nonobese and nondieting individuals who are presumably responsive to internal hunger signals are expected to react to such emotions by eating less. However, research has shown that stress-induction increases eating in hungry dieters compared to nondieters (Herman et al., 1987). Based on

psychosomatic theory, some people are not able to distinguish between internal signals such as hunger or bodily arousal (i.e., emotions) and engage in emotional eating rather than eating in response to hunger (Kaplan & Kaplan, 1957). Research using a large sample of adolescents found a link between elevated psychological and physical symptoms and disordered eating behaviors, a relationship that was more pronounced in females (Buddeberg-Fischer et al., 1996). Additionally, this mismatch appears to be amplified in restrained eaters. Consistent with restraint theory, restrained eaters who experience negative affect become disinhibited resulting in overeating and binge eating episodes (Herman & Polivy, 1984). According to Herman and Polivy (1975), strong emotional arousal corresponds to a loss of self-control in restrained eaters that precedes disinhibition and episodes of overeating.

Beyond emotional arousal, other forms of affective dysregulation have also been linked to maladaptive eating behaviors. For example, subsyndromal depressive symptoms and persons with a history of major depressive disorder have been shown to engage in higher levels of emotional and uncontrolled eating compared to those without a prior diagnosis of depression (Paans et al., 2018). This occurs in a dose-dependent relationship such that increased severity of depressive symptoms predicts more emotional and uncontrolled eating. What's more, research has indicated that eating associated with depressive symptoms is associated with higher intake of sweet foods and a higher intake of fast-food and savory snacks (Paans et al., 2019). As such, there is an established relationship between depressive symptoms and weight gain (van Strien et al., 2016). Of interest, however, this association has been shown to be mediated through emotional eating. Emotional eating associated with depressive symptoms and obesity has been linked to dichotomous thinking (Antoniou et al., 2017). Extreme patterns of thoughts associated with dichotomous thinking provides an "all-or-nothing" attitude that may not only predict greater

depressive symptomology (Antoniou et al., 2017), but also may lead to overeating and binge eating during diet attempts (Fairburn et al., 2003).

Furthermore, restrained eaters and people with overweight and obesity may be at an increased risk of emotional eating, secondary to anxiety sensitivity. Among an overweight and obese sample of men and women, higher levels of anxiety sensitivity (i.e., aversion to anxiety-related symptoms) were associated with greater urges to eat in response to negative emotional states, and fear of losing control during eating episodes predicted emotional eating behavior (Hearon et al., 2013). Compared to normal weight individuals, anxiety sensitivity was elevated in individuals with obesity in this sample. The authors concluded that the elevated levels of anxiety sensitivity, as well as corresponding urges to eat in response to unpleasant emotions, underlies a possible pattern of maladaptive eating behaviors specific to individuals with overweight and obesity.

In addition to internal cues such as emotions, external cues appear to provide indicators for eating as well. External eating refers to eating in response to environmental cues (e.g., sight or smell of food) regardless of hunger or other internal indicators (van Strien et al., 1986). Prior research has found that individuals with higher levels of dietary restraint, regardless of weight status, demonstrated increased responsiveness to the presence of attractive food cues as demonstrated by increased eating (Herman & Mack, 1975). Additionally, restrained eaters have been shown to salivate more relative to unrestrained eaters when presented with food cues (e.g., pizza and cookies; Klajner et al., 1981). More recently, a study comparing a sample of clinical and nonclinical disordered eating populations found that external, emotional, and restrictive eating were all higher in the clinical population, and exposure to food cues in a virtual reality environment predicted higher levels of food cravings in both populations (Ferrer-Garcia et al.,

2015). When controlling for eating disorder (e.g., bulimia or binge eating), external eating remained a significant predictor of food craving. Individuals higher in external eating are also more likely to overeat compared to those lower in external eating (van Strien et al., 2009). External eating is also related to dietary restraint and emotional eating, suggesting that these constructs may be similar in that they each subvert efforts to eat in response to internal hunger and satiety cues.

Suppression of internal hunger cues can have potential consequences in addition to restrained, emotional, and external eating. For example, in a normal-weight sample of young adult women across a two-month period, eating in the absence of hunger was associated with self-reported loss of control over eating, hedonic hunger (e.g., eating for pleasure), and short-term weight gain (Feig et al., 2018). Eating in the absence of hunger has been shown to increase in response to stress (Rutters et al., 2009). It is posited that eating in the absence of hunger and loss of control over eating pose a substantial risk for disordered eating and binge eating (Feig et al., 2018). This risk may be exacerbated, particularly in the presence of body dissatisfaction, dietary restraint, and negative affect. In fact, overeating is also associated with body dissatisfaction (Ackard et al., 2003), and although the causality of this relationship is not definitive, as highlighted earlier, body dissatisfaction has been linked to increased dieting attempts and disordered eating that may form a positive feedback cycle. The link between dieting and disordered eating and its consequences on health and well-being have led researchers to examine more adaptive approaches to eating.

Intuitive Eating

In contrast to disordered eating wherein emotions and externals cues guide eating, intuitive eating provides an adaptive approach in which individuals eat in response to internal

physiological cues to indicate when, what, and how much to eat (Tylka, 2006). Eating intuitively is an inborn characteristic that often has to be relearned due to the adoption of social and cultural rules for eating that override hunger and satiety cues (Avalos & Tylka, 2006; Carper et al., 2000). Intuitive eating is a non-restrictive approach that discourages a focus on weight control, rather, it emphasizes healthy patterns of eating such as for health, satisfaction, and meeting biological needs (Tylka, 2006). According to intuitive eating theory, the three primary reasons for eating are physiological, environmental, and emotional reasons (Gast & Hawks, 1998). Eating in response to physiological reasons is the most adaptive approach, and it is argued that intuitive eating has been suppressed by social pressures, including parents telling children to finish their plate, repetitive dieting, and body image disturbance that promote awareness to alternate cues for regulating eating (Tribole & Resch, 2012). Decreased preoccupation with body image and increased awareness of internal hunger and satiety cues encourage food selection that enable the body to function optimally (Avalos & Tylka, 2006). Further, attention to physiological cues to eat is suggested to enhance the accuracy of interpretation and adherence to instinctive feedback mechanisms related to the optimal content and volume of food consumed (Van Dyke & Drinkwater, 2012).

Intuitive eating is comprised of 10 principles that promote a healthy relationship with food and one's body: 1) reject the diet mentality – disregard the notion of losing weight quickly, easily, and permanently; 2) honor your hunger – eat to satisfy your biological need for food and energy; 3) make peace with food – eat foods that are enjoyed rather than restriction and deprivation; 4) challenge the food police – ignore socially constructed rules about dieting; 5) feel your fullness – mindfully observing satiety cues that say when to stop; 6) discover the satisfaction factor – learn how to eat that allows one to feel satisfied and content; 7) cope with

your emotions without using food – identify ways to comfort, nurture, distract, and resolve emotional issues other than eating; 8) respect your body – learn realistic expectations for one's body in terms of shape and size; 9) exercise – feel the difference – experience how being active, rather than seeking the calorie burning effect, can being motivating, fulfilling, and restorative; and 10) honor your health – gentle nutrition – eat with health in mind rather than for weight loss (Tribole & Resch, 2012). These principles are viewed as guidelines to overcoming environmental influences to reconnect with the innate tendency to eat intuitively. The principles of intuitive eating have been summarized to reflect three core components: 1) unconditional permission to eat when hungry and food is desired; 2) eating for physical rather than emotional reasons; and 3) reliance on internal hunger and satiety cues to determine when and how much to eat (Tylka, 2006).

Rather than attempting to ignore hunger signals or restrict foods considered unacceptable, the unconditional permission to eat enables individuals to eat food that is desired in the moment in response to physiological hunger signals (Tribole & Resch, 2012). Restrictions on when, how much, and what foods to eat, consistent with restrained eating, increases the likelihood of perceived deprivation, preoccupation with food, and overeating (Polivy & Herman, 1999). Thus, allowing oneself to eat when hungry coincides with eating less than those who restrict their food intake (Tylka, 2006).

Intuitive eating encourages consuming food to satisfy hunger signals rather than coping with emotional discomfort or general distress (Tribole & Resch, 2012). The boundary model posits that individuals who eat intuitively are bound by hunger and satiety and will eat to reduce hunger, stopping when satiated (Herman & Polivy, 1983). As noted earlier, these individuals are likely to eat less when anxious compared to when calm due to physiological changes to gastric

contractions and blood sugar that suppress appetite during times of emotional distress. In contrast, restrained eaters experience an unnatural diet boundary (i.e., restraint in response to physiological hunger) that, when breached (i.e., eating outside one's diet), leads to disinhibition. The diet boundary is often disrupted by emotional distress, evidenced by restrained eaters who increase eating when experiencing negative affect (Costanzo et al., 2001; Herman et al., 1987).

Finally, awareness and trust of internal hunger and satiety cues, an innate tendency, promotes intuitive eating (Tribole & Resch, 2012; Tylka, 2006). These internal cues are often interrupted throughout development due to internalization of messages prescribing when, how much, and what to eat (i.e., dieting; Tylka, 2006). A strong connection with physiological mechanisms for eating promotes low preoccupation with food, perhaps as an alternative to the dysfunctional eating patterns (e.g., binge eating) that occur in response to more restrictive methods.

Intuitive eating has been shown to be conceptually different from flexible control, a form of restrained eating (Tylka et al., 2015). Flexible dietary control refers to a gradual approach to weight loss that permits limited, rather than completely restricted, quantities of desirable foods and is posited to encourage consistent and sustainable dieting (Westenhoeffer et al., 2013). While less restrictive than many forms of dieting, intuitive eating and flexible control are still inversely related, and those individuals who engage in flexible control still often evidence rigid control (e.g., all-or-nothing thinking, with alternating periods of strict periods of dieting and consumption of calorie dense foods; Westenhoefer et al., 2013; Tylka et al., 2015). Although intuitive eating and flexible control seem to present similar behaviors (e.g., eating less to compensate for a large meal), the theoretical underpinnings are quite different as highlighted by Tylka and colleagues (2015). For example, intuitive eating emphasizes eating in response to

internal hunger and satiety cues whereas the shared variance with between rigid and flexible control suggests these eating styles correspond to external control of eating behaviors. In other words, rigid and flexible control are likely both forms of restrictive eating, albeit on different sides of a continuum. Moreover, it is uncertain whether exertional control over eating behaviors, as opposed to unconditional permission to eat, can be an adaptive strategy (Tylka et al., 2015).

Some research has suggested that intuitive eating may be linked to inadequate nutrition and potential weight gain should individuals have unrestricted permission to eat foods they desire (Gast & Hawks, 2000). This concern relies on the untested assumption within the intuitive eating model that eating according to physiological mechanisms will lead to a healthy, balanced diet (Hawks et al., 2004). Indeed, responsiveness to food cravings among external and emotional eaters is linked to higher caloric intake and higher body weight (Hill et al., 1991). However, cross-sectional research among undergraduate students found that higher levels of intuitive eating were associated with greater dietary diversity among men and women (Smith & Hawks, 2006). Although not direct and definitive evidence of greater nutritional quality, diet diversity has been positively associated intake of fruits, vegetables, and whole grains (Azadbakht & Esmaillzadeh, 2011) and health status (USDA, 2015). The same study also indicated that intuitive eating was associated with greater pleasure in food consumption, less health-consciousness in food choices, and lower BMI (Smith & Hawks, 2006). Although health consciousness has been linked to healthy dietary and lifestyle behaviors (Hearty et al., 2007), it may be considered a negative attribute in the context of intuitive eating. Individuals high in health-consciousness are critical of the nutritional content of foods they consume (e.g., fat and caloric value; Schifferstein & Oude Ophuis, 1998) and are likely to restrict foods that are not considered health promoting. For example, health conscious individuals may categorize foods as

unhealthy (i.e., associated with weight gain) or healthy (i.e., associated with weight loss or weight maintenance) and therefore avoid eating unhealthy foods despite hunger and desire for such foods, behaviors similar to restrained eaters. Further, these monitoring behaviors may contribute to a sense of deprivation and preoccupation with foods considered taboo (i.e., not consistent with weight management). In contrast, eating outside of dichotomous thinking about food (e.g., "good" versus "bad" label often found in highly restrained eaters) appears to enhance pleasure in eating. Enjoyment in eating, rather than mere food consumption, may counteract perceptions of deprivation common in health-conscious and restrained eaters that provide an increased risk for overeating and binge eating episodes (Polivy, 1996).

A growing body of literature does, in fact, highlight intuitive eating as a more sustainable approach to weight loss compared to conventional dieting approaches. Intuitive eating has demonstrated an inverse relationship with disordered eating symptomatology (Shouse & Nilsson, 2011; Tylka, 2006; Tylka & Kroon Van Diest, 2013), restrained eating (Anderson et al., 2016; Tylka et al., 2015), bulimia and food preoccupation (Tylka et al., 2015; Tylka & Wilcox, 2006), binge eating behaviors (Denny et al., 2013; Madden et al., 2012; Tylka et al., 2015, and dieting (Denny et al., 2013; Tylka & Wilcox, 2006). A review of cross-sectional studies has also indicated that intuitive eaters have significantly lower BMI compared to non-intuitive eaters based on self-reported height and weight (Van Dyke & Drinkwater, 2012). Intuitive eating has also demonstrated benefits in assisting participants with weight maintenance as well as reducing weight cycling. As noted previously, weight cycling is associated with increased risk of overweight and obesity (Dulloo et al., 2015), and increased intuitive eating may therefore help to prevent future weight gain.

In addition to the divergence from dieting approaches, intuitive eating has demonstrated psychosocial benefits as well. Intuitive eating is negatively associated with negative affect and positively associated with positive affect, distress tolerance, and greater emotional awareness (Bruce & Ricciardelli, 2016). Eating more intuitively is also positively related to body satisfaction, body appreciation, and an increased focus on body function rather than appearance and is negatively associated with internalization of the thin-ideal and pressure for thinness from others (Bruce & Ricciardelli, 2016). Likewise, intuitive eating encourages realistic expectations for body size while subsequently discouraging body comparisons and negative self-talk about body size and shape. These relationships likely occur through increased awareness through respect and care for the body (Tribole & Resch, 2012). Furthermore, research has demonstrated a positive relationship between intuitive eating and psychological well-being (Iannantuono & Tylka, 2012; Tylka et al., 2015; Tylka & Kroon Van Diest, 2013) as well as life satisfaction (Tylka, 2006; Tylka et al., 2015; Tylka & Kroon Van Diest, 2013).

In order to further understand the mechanisms of adaptive eating behaviors, Avalos and Tylka (2006) developed an acceptance model of intuitive eating among college women using self-report data from a quantitative survey (Figure 3). The model highlighted the mediating role of body function and body appreciation between acceptance from others (e.g., friends, relatives, romantic partners), in general and in terms of bodily acceptance, and intuitive eating. Acceptance is suggested to negate the need for social approval and internalization of ideal standards, allowing individuals to benefit from greater awareness of internal rather than external indicators for guiding eating behaviors. Emphasis on functionality, which promotes eating according to internal hunger and satiety signals, predicted positive feelings towards one's body (i.e., body appreciation). Research has indicated that the opposite is also true, that pressure to lose weight

contributes to increased focus on appearance rather than internal experiences (Birch et al., 2003; Carper et al., 2000; Tylka & Hill, 2004). Within the model, body appreciation predicted intuitive eating, suggesting that positive body orientation, as opposed to body dissatisfaction, supports a tendency to honor bodily signals (Avalos & Tylka, 2006). The authors concluded that positive body acceptance by others may increase appreciation and functionality of internal bodily signals that promote eating intuitively.

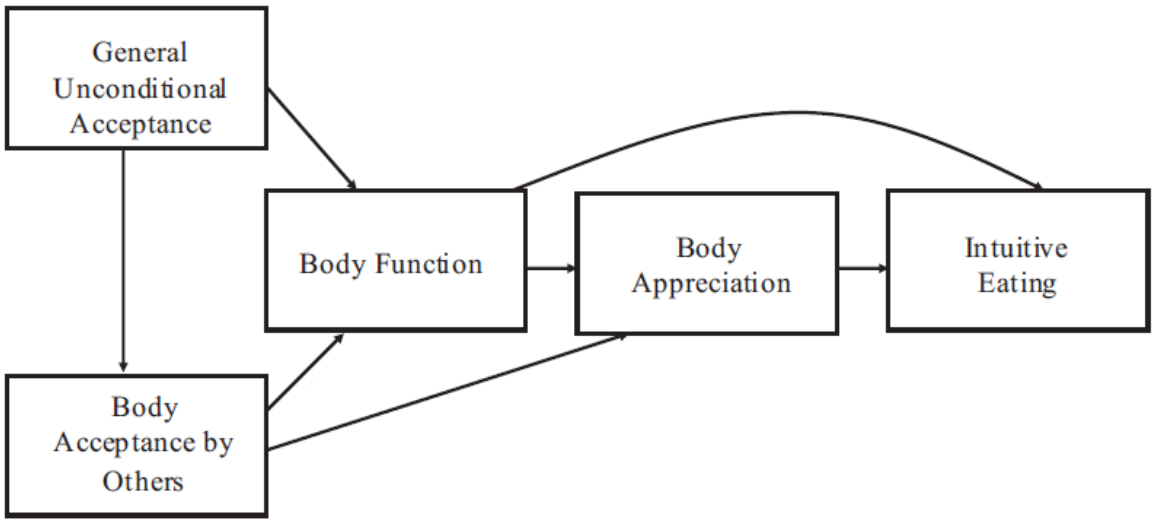


Figure 3. Acceptance model of intuitive eating (Avalos & Tylka, 2006).

The acceptance model of intuitive eating was expanded to incorporate BMI among emerging adult women (i.e., college), early adult women, and middle adult women (Augustus-Horvath & Tylka, 2011). This study upheld the generalizability of the model among women across age groups. In addition, BMI negatively predicted body acceptance by others but had no effect on body appreciation. Therefore, it appears that women's weight status has minimal effect on how they think about their body, rather it is their perception of whether others view them as acceptable or meeting culturally approved ideals. The authors concluded that interventions

should target body orientation (i.e., appreciation and dissatisfaction) and embodiment (i.e., body awareness and responsiveness) to promote adaptive eating and psychological well-being.

The acceptance model provides a suitable framework for understanding the relationship between acceptance from others, body orientation and intuitive eating, yet it does not elaborate on the importance of the internal nature of acceptance. For example, how might self-regulation affect adhering to culturally driven ideals for body appearance? According to objectification theory, women valued for their appearance begin to view themselves through the lens of others (Frederickson & Roberts, 1997) and adopt an observer's perspective of their external appearance which results in a departure from awareness and concentration on internal experiences (e.g., hunger, emotions) and tasks unrelated to appearance (Augustus-Horvath & Tylka, 2011). Indeed, internalization of appearance ideals accepted by society is considered a causal factor in the onset of body image concerns (Cahill & Massup, 2007).

Research with men has recently confirmed a model of objectification theory and muscle dysmorphia (Heath et al., 2016). Self-objectification, self-evaluation in terms of socially approved appearance ideals, was found to mediate the relationship between internalization of the mesomorphic ideal and body surveillance (see Figure 4). Consistent with research among women, these findings highlight that men who adopt societal body ideals are more likely to view themselves as objects and monitor their outward appearance to determine their value through the perceived evaluation of others. Additionally, body image disturbance, in terms of muscular dissatisfaction, independently mediated the relationship between body surveillance as well as internalization of the mesomorphic ideal and muscle dysmorphia characteristics (e.g., ignoring pain to exercise, doing whatever it takes to gain muscles). As noted earlier, an increased focus on external appearance is likely to detract from awareness of physiological cues to eat (Augustus-

Horvath & Tylka, 2011). Although previous research has indicated that men diet less than women (Jensen & Holm, 1999), men with muscular dissatisfaction may be more likely to ignore satiety cues in the opposite direction of women such that they eat excess calories in order to gain muscle mass (i.e., bulking; Lavender et al., 2017).

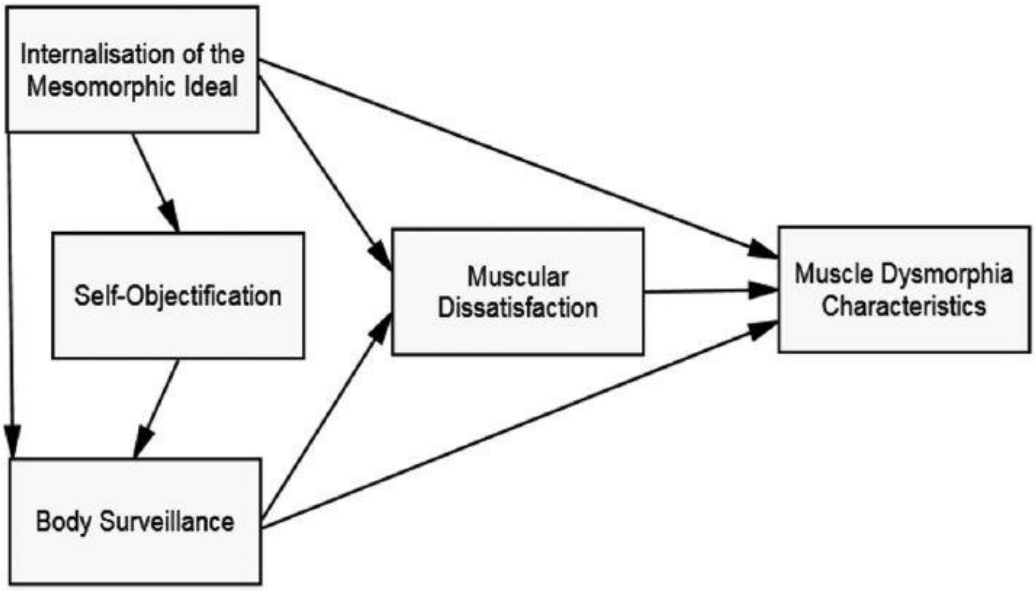


Figure 4. Hypothesized model of the relationships between objectification theory variables, muscular dissatisfaction, and muscle dysmorphia characteristics in men (Heath et al., 2016).

The etiology of body image disturbance and disordered eating behavior appears to vary between men and women, yet objectification processes appear to apply to both sexes (Heath et al., 2016). Further research is needed to determine whether an acceptance model of intuitive eating is applicable to men, and although such a framework is lacking, internalization and reinforcement of attention to one's outward appearance may coincide with self-directed criticisms and comments, likely exacerbating attention to outward appearance and suppression of physiological hunger cues. However, numerous lines of research have demonstrated a positive link between intuitive eating and self-compassion, suggesting a pathway for reducing distress

related outward appearance and suppression of physiological hunger cues (Neff & Knox, 2017; Schoenefeld & Webb, 2013; Webb & Hardin, 2016)

Self-Compassion

Self-compassion is an increasingly popular concept that has drawn much attention for its relationship with positive psychological outcomes, particularly body appreciation and intuitive eating. Although relatively new in Western culture, self-compassion is a concept from Eastern philosophical thought that is conceptualized as a way of relating to oneself in a caring and supportive manner when encountering setbacks and suffering (Neff, 2003a). Self-compassion is derived from the general concept of compassion which refers to being touched by the suffering of others and opening awareness to the pain of others in order to feel kindness and a desire to alleviate their suffering (Wispe, 1991). Compassion also comprises nonjudgmental understanding of wrongdoing that enables actions to be viewed in the context of shared human fallibility. According to Neff (2003a), self-compassion involves being touched by and open to one's own suffering without avoidance to heal oneself with kindness as well as nonjudgmental understanding of one's pain and failures that are experienced as a part of the larger human experience. Embedded in that definition, self-compassion is comprised of three core components, including self-kindness, common humanity, and mindfulness (Neff, 2003b). These are viewed as interrelated processes that promote an adaptive framework when encountering personal mistakes, perceived inadequacies, or various difficulties in life.

Self-kindness, as opposed to self-judgment, includes an approach of love, gentleness, and understanding in order to actively soothe and comfort oneself during times of struggle (Neff, 2003a). This approach contrasts with a self-critical stance of blame and judgment for shortcomings that frequently occur when encountering setbacks. For example, one might

criticize themselves (e.g., I have no willpower, or I am worthless) for eating a calorie dense food while dieting. Self-compassion comes from the perspective of shared human experience or common humanity. Individuals who are compassionate towards themselves understand that mistakes and failures are inevitable and correspond to all humans (Neff, 2003a). Rather than condemning and isolating oneself for perceived inadequacies, self-compassion highlights the imperfections of the human condition, acknowledging that all people struggle at some point in their lives. The third and final component of self-compassion includes a balanced, mindful approach that enables one to be open and aware of experiences as they occur in the present moment in order to recognize distress and cope with unpleasant experiences (Neff, 2003a). In contrast, over-identification with thoughts provides a context for failures and inadequacies to dominate one's life narrative, contributing to a narrowing of behavioral options.

Self-compassion has accrued support linking this concept to a variety of psychosocial factors. A meta-analysis of the literature found a negative correlation between self-compassion and psychopathology with a large effect size (r = -0.54; MacBeth & Gumley, 2012). Specifically, self-compassion is positively correlated with positive affect and negatively correlated with negative affect (Neff, Rude & Kirkpatrick, 2007). These findings have been confirmed in experimental research using mood induction (e.g., recall of mistakes or failures within the previous week; Leary et al., 2007). Self-compassion has also demonstrated a negative relationship with anxious and depressive symptoms (Neff, 2003b; Neff et al., 2007; Mills et al., 2007). Additionally, self-compassion is also negatively related to rumination, thought suppression, and avoidance (Neff et al., 2005; Neff et al., 2007; Neff & Vonk, 2009; Raes, 2010; Thompson & Waltz, 2008). Studies have also found a positive association between self-compassion and well-being (Neely et al., 2009), life satisfaction (Neff et al., 2005), happiness

and optimism (Neff et al., 2007), mastery goals (e.g., persistence in tasks, willingness to seek help, and enjoyment) and intrinsic motivation (Neff et al., 2005), as well as perceived competence (Leary et al., 2007; Neff et al., 2005).

Concepts Related to Self-Compassion

Self-compassion is often compared with self-esteem, and although they share many of the psychological benefits, there appears to be a clear divergence between the two constructs. Self-esteem refers to self-evaluation that is strengthened by attainment of goals and threat of failure (Kernis, 2003). Esteem is contingent upon the degree to which one is judged to be meeting expectations within various domains, and although alternate conceptualizations have argued that *true* self-esteem is unconditional, it does not reflect feelings based on external standards (Deci & Ryan, 1995). Nevertheless, self-esteem is commonly measured through measures of global self-esteem that captures self-liking and self-competence, constructs that reflect evaluation relative to social events and achievement events, respectively (Tafarodi & Milne, 2006). In contrast, self-compassion reflects a positive emotional stance extended towards oneself and is not based on the evaluation of the self, others, or congruence with ideal standards (Neff, 2003a). Research has demonstrated a correlation between self-compassion and self-esteem ranging from $r = .56$ (Leary et al., 2007) to $r = .68$ (Neff & Vonk, 2009), indicating these concepts are related but reflect different constructs. Self-esteem has been shown to be related to self-aggrandizement (e.g., narcissism) whereas self-compassion is not (Neff, 2003b). It is suggested that self-compassion is not contingent on evaluation and meetings set standards, rather it is derived from one's true authentic self (Barnard & Curry, 2011; Neff, 2003b). Additionally, the aforementioned relationship between self-compassion and positive affect, negative affect, anxiety, and depression holds true while controlling for self-esteem (Neff & Vonk, 2009).

Self-compassion has also been differentiated from self-pity in which individuals express concerns that higher levels of self-compassion may contribute to complacency and self-centeredness (Gilbert & Irons, 2005). Self-pity is an ego-centric exaggeration of one's problems that detracts awareness from others experiencing comparable obstacles (Neff, 2011). When individuals feel pity for themselves or others, they are more prone to ruminate on their pain and suffering, forgetting that others encounter similar problems (e.g., "why did this have to happen to me?"; Neff, 2003a, 2003b, 2011). This contributes to a disconnect from others that magnifies their personal suffering. These processes reflect over-identification and isolation, respectively, counter theses to mindfulness and common humanity. Neff (2003a) highlighted that failures and mistakes are not unnoticed or neglected with self-compassion, rather alternative actions are encouraged with gentleness and patience. Nevertheless, it is a common misconception that self-compassion, via self-pity, encourage passivity and self-indulgence which have been suggested to increase self-directed criticism (Rubin, 1975). These concerns seem to be supported by the notion that kindness towards oneself would undermine goals and motivations (Neff, 2003a).

Relatedly, research has indicated that some individuals possess significant fear of self-compassion (Gilbert et al., 2011). Interventions targeting self-compassion have encountered avoidance and fear reactions among participants (Gilbert, 2010). As previously mentioned, self-compassion has been shown to correspond to numerous aspects of emotional well-being (Neely et al., 2009; Neff et al., 2005; Neff et al., 2007), yet research has highlighted a fear of positive emotions (Arieti & Bemporad, 1980; Gilbert et al., 2011). It is posited that positive feelings may facilitate unfamiliarity, unresolved grief of wanting love and kindness, and feeling lonely and rejected (e.g., previous experiences of rejection, neglect, or invalidation; Gilbert & Procter, 2006) depending on a person's learning history (i.e., adverse experiences). Fear of self-

compassion is suggested to be high in individuals who experience elevated self-criticism (Gilbert & Procter, 2006; Mayhew & Gilbert, 2008) as well as individuals with mental health concerns (e.g., anxiety and depression; Gilbert & Procter, 2006). In fact, fear of self-compassion is associated with self-coldness, self-criticism, and depressive symptoms (Gilbert et al., 2011) as well as stress and anxiety (Gilbert et al., 2012). Further, the link between self-criticism and negative affect is compounded by a fear-based response to positive emotionality, perhaps due to perceived threat. Fear of self-compassion has also been linked to difficulties with mindfulness (Gilbert et al., 2012), a core component of self-compassion interventions. Difficulty with developing skills essential for cultivating self-compassion, as well as fears of positive emotions, suggests that individuals are likely to actively resist compassionate experiences and behaviors (Gilbert et al., 2011), reducing the effectiveness of interventions targeting self-compassion.

Self-Compassion and Eating Behaviors

Research has demonstrated a strong link between self-compassion and body image and eating behaviors. Numerous studies have highlighted the negative relationship between self-compassion and body image disturbance (Daye et al., 2014; Duarte et al., 2015; Ferreira et al., 2013; Homan & Tylka, 2015; Mosewich et al., 2011; Pisitsungkagarn et al., 2013; Przezdziecki et al., 2013; Stapleton & Nikalje, 2013) as well as internalization of body ideals (Pinto-Gouveia et al., 2014; Tylka et al., 2015). A similar link has been found between self-compassion and clinical and subclinical eating behaviors (Breines et al., 2014; Ferreira et al., 2013; Ferreira et al., 2014; Gale et al., 2014; Taylor et al., 2015; Webb & Forman, 2013).

Researchers have previously suggested that self-compassion may serve as a protective factor to prevent the development and maintenance of body image disturbance and disordered eating (Tylka & Kroon Van Diest, 2015; Braun et al., 2016). Among a community sample of

women, those high in self-compassion did not experience a correspondence between media pressure to be thin and thin-ideal internalization whereas women low in self-compassion demonstrated strong internalization (Tylka et al., 2015). It may be that individuals who provide greater self-directed compassion are able to respond more flexibly to social pressures related to appearance ideals. In other words, self-compassion may circumvent self-condemning thoughts (e.g., "I will never look the way I want") that accompany pressure from social supports and the media. Furthermore, Breines and colleagues (2014) found that body image disturbance mediated the relationship between self-compassion and disordered eating in a nonclinical sample. The authors suggested that higher self-compassion may promote a greater degree of acceptance towards one's body that protects individuals from self-criticism for failure to meet socially accepted beauty standards. Thus, self-compassion may serve as a buffer against internalization of ideal body standards as well as body image disturbance.

Self-compassion may also reduce the likelihood of maladaptive eating behaviors. In a study examining self-compassion in a treatment seeking sample among individuals with an eating disorder, higher levels of self-compassion at baseline predicted lower levels of shame as well as less severe eating pathology at 12-weeks, whereas low baseline self-compassion and high fear of self-compassion demonstrated no change in eating symptomology across treatment (Kelly et al., 2012). Research by Heatherton and colleagues (1991, 1993) compared dieters with nondieters following two conditions: failure at a seemingly easy task versus completion of a similar task. Dieters who failed the task ate more than dieters who did not experience failure, while nondieters ate less after failure. The authors concluded that experiencing unpleasant thoughts and feelings about oneself following an ego-threat increases the likelihood of

disinhibited eating in those attempting to control their eating. A growing body of literature suggests self-compassion may hinder this relationship.

Research examining the effects of self-compassion on eating behaviors among restrictive and nonrestrictive eaters found that highly restrictive individuals exposed to compassionate messages (e.g., told that everyone eats unhealthy sometimes, including in this study, and not to feel bad) ate significantly less candy following a preload and experienced less distress than highly restrictive eaters who were not preloaded (i.e., control condition; Adams & Leary, 2007). In fact, the restrictive eaters in the self-compassion condition demonstrated behaviors similar to nondieters (i.e., eating less to compensate for eating a preload/breaking a diet). Treating oneself compassionately may promote successful regulation of eating following a transgression/mistake (e.g., breaking one's diet) which provides a more flexible and adaptive approach that may lead to healthier eating behavior. Further, individuals higher in self-compassion are likely less critical of themselves after they break their diets which may decrease the necessity of using food to cope with negative self-directed thoughts and feelings. Indeed, following a hypothetical diet-breaking scenario, college women higher in self-compassion felt better, calmer, and less overwhelmed and were less likely to eat to cope with negative emotions (Adams & Leary, 2007). Neff (2003b) suggests that self-compassion, in contrast to self-esteem, may lead to a realistic view of oneself that enables awareness of shortcomings through desire and caring for oneself rather than a need to improve one's worth or status. This approach provides a gentleness that may alleviate body image disturbance and subsequent restrictive and disordered eating.

Self-compassion has been indicated as a beneficial cognitive-behavioral approach to reducing body dissatisfaction and disordered eating (Braun et al., 2016). Self-critical comments about one's body contributing to body dissatisfaction conflict with the kindness and

understanding associated with self-compassion (e.g., self-kindness; Albertson et al., 2015). Additionally, self-compassion may enable individuals to recognize that they, as human beings, are imperfect, and body image concerns are experienced by many people (e.g., common humanity). Self-compassion, therefore, is likely to foster acceptance and body appreciation by identifying personal values rather than seeking to meet socially constructed standards of physical attraction (Berry et al., 2010). As highlighted earlier, body dissatisfaction and disordered eating are inextricably linked. Similarly, self-compassion may counteract disordered eating behaviors related to body dissatisfaction. Prior research has suggested that disordered eating and maladaptive weight loss behaviors occur as a consequence of self-criticism and subsequent negative self-evaluation (McKinley & Hyde, 1996; Moradi et al., 2005; Myers & Crowther, 2007). In contrast, self-directed compassion may overcome overidentification with negative emotions such as shame or guilt that may allow for a more realistic self-appraisal and identification of attainable goals (Breines and Chen, 2012; Leary et al., 2007). Consistent with these arguments, recent studies have highlighted that self-compassion is related to improvements in body image (Albertson et al., 2015) and healthy eating habits (Sirois et al., 2015).

Research has examined the link between self-compassion and adaptive eating processes through the lens of affect regulation. Webb and Forman (2013) examined a cognitive-affective self-regulatory pathway in binge eating and found that self-compassion covaried with unconditional self-acceptance to predict lower binge eating behavior. While not indicative of adaptive eating, the self-regulation involved in self-compassion may foster acceptance of pain or threat to one's self-concept (e.g., appearance and body) that reduces the cognitive load to attend elsewhere. For example, Avalos and colleagues (2005) noted that less preoccupation with food and body standards likely increases awareness to how one feels and functions internally.

Awareness to physiological hunger and satiety cues provides a greater likelihood of eating for adaptive reasons rather than affect regulation via emotional eating. Indeed, self-regulation is postulated to address the deficits in interoceptive awareness associated with disordered eating (Fairburn et al., 2003). This research was expanded through a self-regulatory model of self-compassion and intuitive eating in college women (Schoenefeld & Webb, 2013). They found that self-compassion and body image flexibility fostered greater acceptance of internal events which subsequently predicted higher levels of intuitive eating. Thus, self-compassion may facilitate intuitive eating through acceptance of unwanted internal events such as self-critical thoughts. Moreover, research has suggested that self-compassion may increase engagement in healthy behavior by enabling individuals to monitor their health goals with less defensiveness and distraction, regulate negative affect, adhere to treatment recommendations, and withdraw from tasks that are not consistent with goals and values (Terry & Leary, 2011). Indeed, self-compassion has been shown to predict health behavior intentions above and beyond current health behaviors in a sample of emerging adults (Sirois, 2015).

The affect regulation process of self-compassion has also been expanded to incorporate internalized weight bias. In a weight diverse sample of women, Webb and Hardin (2016) examined the mediating role of self-compassion and body image flexibility between internalized weight bias and intuitive eating. Internalized weight bias was positively associated with body shame and was inversely related to self-compassion, body image flexibility, and intuitive eating. While controlling for BMI, body image flexibility and self-compassion partially mediated the relationship between internalized weight bias and intuitive eating. The authors concluded that strong stigmatizing attitudes about one's weight likely hinders eating intuitively whereas self-regulation through flexibility and compassion may facilitate adaptive eating behaviors. These

findings highlight that self-regulatory processes such as body image flexibility, and in particular self-compassion, may overcome the deleterious effects of internalization of weight stigma and self-critical thoughts about one's body in order to facilitate eating intuitively.

Self-Compassion Interventions

The numerous psychosocial benefits of self-compassion have prompted new therapeutic approaches to address self-criticism as well as self-directed emotions such as shame and guilt. Compassionate Mind Training (CMT) was developed to facilitate self-soothing and self-reassuring thoughts that overcome self-criticism that originates from early trauma and basic fears, safety strategies, behaviors and beliefs, unintended consequences (e.g., submissive or aggressive in response to others), and self-attacking (e.g., hatred towards self; Gilbert & Irons, 2005; Gilbert and Procter, 2006). This framework provided the foundation for Compassion Focused Therapy (CFT) which focused on skill development such as compassionate reasoning, compassionate behavior, compassionate imagery, compassionate feeling, and compassionate sensation (Gilbert, 2009) and has been used with clinical populations (Gilbert, 2010; Goss & Allan, 2010; Kelly et al., 2009; Lowens, 2010). A systematic review examining the benefits of CMT and CFT suggested these modalities are beneficial for a variety of concerns, including anxiety, depression, psychosis, and smoking (Leaviss & Uttley, 2015). Additionally, Mindful Self-Compassion (MSC), an 8-week program that teaches self-compassion in daily life, has been developed for use in clinical and nonclinical populations (Germer & Neff, 2013). Consistent with research highlighting the link between mindfulness and self-compassion (Baer, 2010; Hölzel et al., 2011; Kuyken et al., 2010; Shapiro et al., 2005), MSC blends basic mindfulness skills with modules designed to increase self-compassion (Germer & Neff, 2013). Randomized control trials have demonstrated significant increases in compassion for self and others, mindfulness, and life

satisfaction as well as decreases in depression, anxiety, stress, and experiential avoidance compared to waitlist controls (Neff & Germer, 2013). With these findings, self-compassion appears to have growing support as an intervention for psychosocial outcomes.

Relevant to the current study, there is growing support for self-compassion interventions targeting health behaviors as well. A two-week self-compassion intervention (e.g., three 90-minute sessions consisting of an introduction to mindfulness and self-compassion, experiential exercises, writing exercises, and take-home audio exercises) among undergraduate men and women demonstrated significant increases in self-compassion and healthy self-regulation (e.g., personal growth self-efficacy and healthy impulse control) as well as decreases in anxious and depressive symptoms and unhealthy self-regulation (e.g., self-judgment and habitual negative self-directed thinking) compared to a control group (Dundas et al., 2017). Improvements in self-compassion and psychological functioning were maintained at six-months and one-year follow-up. The authors concluded that brief interventions that improve self-compassion can facilitate changes in self-regulation as well as overall mental health with long-term effects. As noted earlier, self-regulation may promote compassion and flexibility that facilitate eating intuitively (Webb & Hardin, 2016).

A recent systematic review of six studies examined the efficacy of interventions aimed at increasing self-compassion among populations with obesity and other weight-related psychological conditions (Rahimi-Ardabili et al., 2018). Based on the findings examined, the authors concluded that self-compassion interventions may reduce barriers to healthy weight management through emotional regulation by addressing self-critical thoughts, decreasing stress, and increasing acceptance of emotionally charged self-statements. Moreover, research has identified the aforementioned psychological factors, particularly related to body dissatisfaction

and disordered eating behaviors, as important targets for healthy weight management (Lazzeretti et al., 2015). As suggested by the small pool of studies included in the review, more research is needed in this area.

A three-week intervention compared a waitlist control group to a self-compassion condition in which participants were asked to listen to a 20-minute guided self-compassion meditation from the MSC program each day (Anderson et al., 2015). The intervention group demonstrated significantly greater improvements in self-compassion (d = .82) and body appreciation (d = .62) as well as reductions in body dissatisfaction (d = .73), body shame (d = .68), and contingent self-worth on appearance (d = .45) which were maintained at three-month follow-up. Similarly, a randomized control trial among a clinical population with binge eating disorder comparing self-compassion and behavioral strategy self-help conditions to a control condition demonstrated reduced mean weekly binge days over a three-week period (Kelly & Carter, 2015). Of note, the self-compassion condition demonstrated significantly greater decreases in eating disorder pathology, weight concerns, and eating concerns compared to the behavioral strategies and control conditions. Additionally, a 5-day residential intervention incorporating mindfulness, self-compassion, acceptance, and intuitive eating into a yoga-based weight loss program found improvements in nutrition behaviors, self-compassion, mindfulness, and stress management post intervention and at three-month follow-up (Braun et al., 2012). Participants also demonstrated significant weight loss at one-year follow-up, suggesting that self-compassion and its corollaries provide a promising avenue for addressing common barriers among weight loss seeking individuals. Other research has highlighted how these relationships may facilitate weight loss as opposed to weight gain that is commonly observed with disordered eating and dieting.

In a two-part study, Mantzios and Wilson (2014) sought to determine the impact of self-compassion and mindfulness on psychological factors among an undergraduate population seeking to lose weight (no intervention was given). Self-compassion and mindfulness independently predicted weight loss over a five-week period, and even more interesting was the finding that self-compassion fully mediated the relationship between cognitive-behavioral avoidance as well as negative automatic thoughts and weight loss. In the second part of the study, participants seeking to lose weight completed diary entries at every meal with instructions to spend a few moments prior to eating thinking about how to eat (e.g., how does the food smell; concrete construal condition) or why to eat (e.g., why is it important to eat less; abstract construal condition) over a five-week period. Participants in the concrete construal condition experienced increased mindfulness, self-compassion, and weight loss as well as decreased cognitive-behavioral avoidance and negative automatic thoughts. The abstract construal condition demonstrated the exact opposite outcomes. The authors suggested that the link between abstract construals and poorer outcomes was likely due to an evaluative and self-punitive approach such that this mindset detracts from the present moment by enabling comparisons and identification with failures, inadequacies, and mistakes. In contrast, self-compassion supports attention to concrete aspects of the present moment (e.g., thoughts, taste) that coincides with awareness to physiological hunger and satiety cues to eat rather than to reduce or alter unpleasant thoughts. In light of these findings, self-compassion has the potential to improve adaptive functioning and well-being, important factors for health behaviors and weight management, while also reducing psychological barriers to health behaviors (i.e., avoidance and self-critical thoughts).

Brief Self-Compassion Interventions

Research has highlighted that brief self-compassion interventions may be also be effective. For example, Anderson and colleagues (2015) suggested that shorter interventions have the potential to demonstrate significant gains in self-compassion. A brief online intervention designed for new mothers who experienced a challenging birth provided two online videos and a tip sheet introducing self-compassion, techniques for being more compassionate to oneself, and guided exercises (Mitchell et al., 2018). Participants experienced a significant increase in self-compassion and maternal body image as well as a decrease in post-traumatic stress symptoms. Additionally, over 95 percent of participants reported the intervention materials as helpful. Among undergraduate women, a one-week self-compassion intervention sought to reduce body image distress (Toole & Craighead, 2016). The intervention consisted of an initial in-person self-compassion meditation training session (e.g., completion of baseline measures and first 20-minute meditation exercise), following which participants were sent a link each day to listen to a 20-minute self-compassion meditation training podcast (e.g., compassionate body scan, affectionate breathing exercise, and loving-kindness meditation toward the body). Participants in the intervention demonstrated decreases in self-criticism and appearance-contingent self-worth as well as increases in body appreciation compared to a waitlist control. Both groups demonstrated global increases in self-compassion and decreases in body shame and body dissatisfaction, which the authors suggested may have been influenced by demand characteristics or low power (N = 80). Of note, however, participants were not informed at the outset of the study that the intervention targeted self-compassion and body image concerns, and the intervention did not include education on self-compassion and its components. Despite these limitations, the authors concluded that brief exposure to self-compassion has the potential to

impact important factors of body image distress (Toole & Craighead, 2016). However, replication of these effects is clearly warranted.

Single self-compassion exercises have also demonstrated effectiveness in promoting self-compassion. In an experimental study using a mood-induction task (e.g., music and negatively valanced mood statements), participants were asked to recall and write about a current or recent unpleasant negative event (Odou & Brinker, 2014). Following this prompt, participants were randomized to write either a self-compassionate or emotionally expressive statement for 3-4 minutes. Writing in a self-compassionate way exhibited greater improvements in mood compared to the emotionally expressive condition. In a similar study, a reflexive writing task was used to assess self-compassion, self-esteem, and body image following a body dissatisfaction induction (e.g., viewed 16 magazine images depicting young, thin women; Moffitt et al., 2018). Participants were randomized into a self-compassion, self-esteem, or distraction (control) condition. In the self-compassion condition, participants were instructed to write a paragraph to themselves for three-minutes expressing kindness, compassion, and understanding towards themselves with regard to weight, appearance, and body shape. The self-esteem condition wrote for three-minutes describing their positive qualities, and the control condition wrote describing a hobby they enjoy. The self-compassion condition produced lower weight dissatisfaction and appearance dissatisfaction compared to the other conditions, and, although not statistically significant, lower average bodily distress. Self-compassion is suggested encourage more effective emotional processing that overcomes the rumination associated with perceived inadequacies (Odou & Brinker, 2014). Effective emotion regulation strategies may therefore enable individuals to identify adaptive strategies in response to self-criticism and emotional distress related to body image disturbance that often leads to disordered eating.

In sum, brief self-compassion interventions appear to be a viable modality for promoting adaptive eating behaviors and well-being by targeting body orientation and embodiment (Augustus-Horvath & Tylka, 2011). Although various modalities for brief interventions (e.g., online, mobile apps) hold promise for delivering improvements in self-compassion and body image disturbance, researchers have suggested that alternative methods to increase engagement should be examined (Mitchell et al., 2016). Further, several lines of investigation have indicated that brief exposure to self-compassion training, as opposed to high frequency of formal practice, is sufficient to produce measurable changes in thinking, feeling, and behavior towards oneself and one's body (Mitchell et al., 2016). Thus, the current study aimed to provide a brief intervention comprised of education and exercises that promote learning self-compassionate skills.

Online Self-Compassion Interventions

Access to the benefits of self-compassion interventions is a considerable barrier despite the numerous aforementioned benefits. Advancements in technology have enabled the delivery of online interventions through various modalities, including internet-based therapy, mobile applications, and online skills training. Systematic reviews of online counseling interventions have shown that these programs can reduce delivery costs, provide more timely services, reduce stigma, and reduce barriers to treatment access (e.g., geographical distance, time, in adequate transportation; Andersson, 2016; Bennett & Glasgow, 2009; Griffiths et al., 2006). Further, online interventions have also demonstrated similar outcomes to face-to-face psychotherapy (Andersson & Titov, 2014). Although most self-compassion programs require in-person attendance, there is a growing body of research supporting the development of self-compassion through online interventions. There is evidence that general online mindfulness interventions can

increase self-compassion (Ivtzan et al., 2016; Rao & Kemper, 2017; Taylor et al., 2014), which is not surprising given that mindfulness is a core component of self-compassion. Additionally, self-guided programs have gained support for learning mindfulness online as well (Cavanagh et al., 2014). Self-compassion has also been examined as a primary outcome variable. A four-week self-compassion program delivered through a mobile application demonstrated increased self-compassion and mental well-being through daily self-compassion exercises (Mak et al., 2018). Further, a two-week online compassionate mind training program was effective for improving self-compassion and self-criticism in 123 pregnant women (Kelman et al., 2018). Randomized controlled trials have also found support for online self-compassion programs in addressing body image concerns (Albertson et al., 2015), binge eating behaviors (Kelly & Carter, 2015), and self-criticism in athletes (Mosewich et al., 2013).

A recent online RCT examined the effects of a self-guided self-compassion intervention for women compared to a waitlist control (Nadeau et al., 2020). In a sample of 57 women from a nonclinical population, the 10-week program demonstrated significant increases in self-compassion and decreases in self-judgment, perfectionism, and shame relative to the control as well as across time and one-month following the intervention. The outcomes of this study provide preliminary evidence for the effectiveness of self-paced online interventions for self-compassion. Self-paced or online self-compassion interventions offer anonymity and less barriers to treatment while simultaneously increasing the probability of service adoption as a supplement to existing services (Nadeau et al., 2020). Therefore, the current study delivered a brief, self-paced online self-compassion intervention targeting body image and adaptive eating. Despite the strong findings demonstrating support for self-compassion interventions, research on the mechanisms underlying the changes in self-compassion is still lacking.

Self-Compassion and Psychological Flexibility

Self-compassion interventions aim to increase an individual's adaptability in responding to what are considered inevitable discomforts in life in response to mistakes, perceived inadequacies, and overall suffering. There appears to be considerable overlap in this approach to the core process of Acceptance and Commitment Therapy (ACT), psychological flexibility. Psychological flexibility is conceptualized as the ability to contact the present moment in order to change or persist in behavior when doing so serves personal values which emphasizes a broad, adaptive repertoire of overt and private behaviors (e.g., thinking and feeling), even when encountering painful and uncomfortable experiences (Hayes et al., 2006; Hayes et al., 1999). Consistent with the ACT framework, psychological inflexibility corresponds to experiential avoidance, that is, the attempt to alter or change the form, frequency, or intensity of private, internal events (Hayes et al., 1996). Research has shown that reducing or attempting to change unpleasant internal experiences will increase the intensity of such experiences in the future, reinforcing further experiential avoidance behaviors.

In the case of self-critical thoughts related to body image or general psychological distress, a struggle and attempts to change them are likely to ensue. Through experiential avoidance and emotional eating, food and the act of eating is often used as a means to reduce, change, or rid these unpleasant experiences. Likewise, food restriction to reduce body dissatisfaction may serve a similar function. Subsequently, behaviors that are temporarily effective (e.g., binging, restraint) are reinforced and become rigid and dominant (Törneke, 2010). Psychological flexibility, however, may coincide with awareness of self-critical thoughts without attachment rather than struggle, over-identification, or attempts to change them (Yadavia et al., 2014). Similarly, consistent with the principles of self-compassion, self-kindness promotes

compassionate acceptance by abandoning self-invalidating efforts at emotional control. In fact, measures of psychological flexibility (Acceptance and Action Questionnaire-II; AAQ-II; Bond et al., 2011) and self-compassion (Self-Compassion Scale; SCS; Neff, 2003a) have demonstrated a high correlation (r = .65; unpublished data cited in Neff & Tirch, 2013).

Although research on these two overlapping concepts is limited, Neff and Tirch (2013) argued that ACT and self-compassion share several theoretical underpinnings. First, consistent with Relational Frame Theory (RFT), ACT and self-compassion each emphasize perspective-taking. Shifting perspectives is relevant for understanding the nature of language and cognition that contribute to critical or compassionate thoughts. For example, perspective taking enables individuals to shift between the self and others (i.e., self-compassion) as well as self and thoughts (i.e., ACT; Vilardarga, 2009). In RFT terms, this is referred to as deictic framing (Hayes et al., 2001). Second, self-compassion emphasizes self-kindness, a similar concept to self-acceptance that is associated with psychological flexibility within the ACT framework (Yadavia et al., 2014). Experiential avoidance during unpleasant experiences is often considered wrong or bad and therefore self-invalidating. In contrast, acceptance of discomfort requires psychological flexibility and is contacted through profound self-kindness. Third, the hexaflex processes outlined in ACT directly influence compassion for self and others (Dahl et al., 2009; Neff & Tirch, 2013). Moreover, each framework utilizes a similar structure and modules for change. Self-compassion includes willingness to experience unpleasant internal experiences (i.e., acceptance), mindful observation of present-moment experiences (i.e., mindfulness, defusion), engagement of goals consistent with self-kindness and self-validation (i.e., values, committed action), and shifting perspective to a broader sense of self (i.e., self-as-context; Hayes, 2008; Neff & Tirch, 2013).

A randomized clinical trial (RCT) comparing a brief ACT intervention targeting self-compassion to a wait-list control (WLC) assessed the mediating role of psychological flexibility (Yadavia et al., 2014). The ACT condition demonstrated a significant large improvement from pre to post (d = 1.15) and from pre to follow-up (d = 1.54) in self-compassion, which was significantly different from the WLC (d = 1.06). Moreover, psychological flexibility significantly mediated pre (1-week before the intervention) to follow-up (8-9 weeks post-intervention) changes in self-compassion, general psychological distress, depression, anxiety, and stress, highlighting psychological flexibility as a core process in the outcomes of this study. It is important to note, however, that practitioners and researchers have explored the role of self-compassion in ACT interventions despite it not being a formal component of the model (Forsyth & Eifert, 2008; Hayes, 2008; Luoma et al., 2012; Neff & Tirch, 2013; Tirch, 2010; Van Dam et al., 2010). It has been suggested that compassion, for the self and others, may be rooted in the core processes that produce therapeutic change in the ACT model (Hayes, 2008). Nevertheless, to my knowledge, psychological flexibility has not been examined in the context of a self-compassion intervention. Indeed, research has highlighted the need for examining processes of change among brief interventions in order to reduce unnecessary barriers to effective intervention development (Levin et al., 2012; Yadavia et al., 2014)

Prior research has indicated that psychological flexibility provides a critical avenue to increasing engagement in healthy, valued behaviors despite the presence of unpleasant internal experiences. It is suggested that eating intuitively corresponds to engaging in behaviors consistent with one's values, particularly in the domain of food and/or health, despite the presence of negative thoughts and feelings about one's body (Schoenefeld & Webb, 2013). Flexibility rather than over-identification with aversive body image-related content may increase

the propensity to pursue goals in valued life domains (Webb & Hardin, 2016). For example, research in an overweight sample has demonstrated a positive association between psychological flexibility and intuitive eating (Sairanen et al., 2015). Specifically, psychological flexibility explained unconditional permission to eat and eating for physical reasons. Through a non-evaluative stance toward feelings and thoughts, psychological flexibility likely promotes an open relationship with food and reduces food as a coping mechanism (i.e., experiential avoidance).

Current Study

We are all naturally born intuitive eaters, and responding to hunger and satiety cues is an adaptive mechanism that has ensured our survival as individuals and as a species by providing our bodies and our cells with the nourishment necessary to function optimally (Tribole & Resch, 2012). As a social species, we consistently look to our surroundings for cues to ensure support and acceptance to enhance our chances of survival. Although this is an adaptive mechanism, the evolution of normative appearance and body standards has contributed to an emphasis on these areas for social status. These concerns are perceived as relevant to the likelihood of acceptance and receiving support from others, and the greater the discrepancy between our current body/appearance and ideal body, the greater the distress one is likely to experience. Through restrictive eating and dieting to reduce the distress stemming from incongruence between our bodies and ideal standards to meet social demands, we have altered the cues to which we rely for eating, attending to the external environment (e.g., smell and sight of food) and internal stimuli (e.g., emotions, painful thoughts). Counterintuitively, these efforts have contributed to reduced weight loss, weight gain, heightened distress, future dieting attempts, and greater disordered eating. Subsequently, intuitive eating has decreased while disordered eating behaviors have increased in an effort to lose weight as well as reduce psychological discomfort. In sum,

sociocultural factors contributing to ideal body standards, as well as the obesogenic environment, have detracted from our innate ability to eat based on physiological cues and function (i.e., intuitive eating).

Numerous treatment options have become available in recent decades to address the rising obesity epidemic and accompanying psychological distress. The development of behavioral weight loss interventions has proved effective for some individuals to address overweight and mild to moderate obesity (Wing & Phelan, 2005), yet weight regain post-intervention continues to be a concern (Wadden et al., 2004). Additionally, research has shown that internalized weight bias tends to persist following behavioral weight loss interventions (Carels et al., 2010), suggesting underlying factors contributing to weight gain are not fully addressed with these treatments. Targeting eating behaviors as well as body image and self-critical thoughts concurrently is therefore an important pathway for developing adaptive eating behaviors. Research has called for the inclusion of compassion-focused and acceptance-based modalities for ameliorating the harmful effects of self-critical thoughts on body image (e.g., body dissatisfaction) and eating behaviors (e.g., emotional and binge eating; Webb & Hardin, 2016). Furthermore, clinicians are encouraged to address body orientation, including body functionality (i.e., eating in response to internal cues), in order to promote the physical and psychological benefits of intuitive eating (Avalos & Tylka, 2006).

There is a growing body of literature highlighting the efficacy of compassion-focused and acceptance-based interventions for body image and eating behavior (Adams & Leary, 2007; Albertson et al., 2015; Butryn et al., 2013; Hill et al., 2014; Kelly & Carter, 2015). Although there is strong preliminary support for self-compassion interventions on body weight and related behaviors, research has indicated there is a need for more studies to strengthen these findings

(Rahimi-Ardabili et al., 2018). Additionally, Webb and Hardin (2016) highlighted the utility of integrating self-compassion treatment targets for enhancing outcomes related to intuitive eating. Brief self-compassion interventions are equipped to promote changes in openness and acceptance, which have demonstrated a strong link with intuitive eating as well as an inverse relationship with disordered eating behavior. Further, online self-compassion interventions have garnered increasing empirical support for primary and secondary outcomes associated with self-compassion (Eriksson et al., 2018; Kelly & Carter, 2015; Kelman et al., 2018; Mak et al., 2018; Mosewich et al., 2013; Nadeau et al., 2021; Przezdziecki et al., 2016). However, there are currently no studies examining intuitive eating outcomes and underlying mechanisms for these interventions. Thus, the current study examined the effectiveness of a brief, self-paced online self-compassion intervention targeting body image and adaptive eating behaviors as well as potential mechanisms of change (e.g., self-compassion and psychological flexibility) among undergraduate men and women. The findings from this study provide implications for addressing factors associated with weight gain as well as potential areas to consider for tailoring behavioral weight loss interventions to counter the negative consequences associated with the dieting mentality.

Specific Aim One

The primary aim of the current study was to examine the effectiveness of a brief, self-paced online self-compassion intervention adapted for body image and intuitive eating compared to an active control group among college men and women. Intuitive eating promotes eating in response to physiological hunger and satiety cues (Tribole & Resch, 1995; Tylka, 2006) and has been linked to better weight management, body appreciation, and psychosocial outcomes compared to disordered eating behaviors such as restrained eating (Bruce & Ricciardelli, 2016;

Van Dyke & Drinkwater, 2012). Among college undergraduates, there is a significantly higher prevalence of disordered eating behavior than the general population (Luce et al., 2008; O'Dea & Abraham, 2002) which suggests that this population, while not clinical in nature, likely engages in lower levels of intuitive eating. Further, comparisons of gender differences across the intervention shed light on how these constructs vary between men and women.

Despite the abundance of literature examining the effectiveness of self-compassion interventions as well as outcomes related to body image and intuitive eating, there is a paucity of research comparing outcomes among men and women. Men are frequently excluded from research, interventions in particular, examining intuitive eating and body image distress as these concerns are proposed to manifest differently (Grossbard et al., 2008; Toole & Craighead, 2016). Additionally, research has called for future studies to determine who is likely to benefit more from self-compassion interventions (Rahimi-Ardabili et al., 2018). This remains a particularly important topic as research has highlighted that the prevalence of weight loss efforts, body image disturbance and maladaptive eating behaviors among men continues to rise and rivals that of women (Bacon & Aphramor, 2011; Fallon et al., 2014; Goldschmidt et al., 2018). Research has highlighted that women tend to be less compassionate (Yarnell et al., 2015) and more critical of themselves compared to men (DeVore, 2013; Leadbetter et al., 1999). As such, women have the potential to experience greater improvements in body image and eating behaviors as they demonstrate increases in self-compassion. Additionally, men have been shown to experience higher fear of self-compassion than women (Gilbert et al., 2010, 2012). Discomfort and fear of experiencing positive emotions, as well as concerns that self-compassion may foster self-pity and complacency, are likely to hinder engagement in compassionate exercises and behaviors.

Although there is a clear gap in the literature, research has suggested that women may benefit more from self-compassion interventions (Rahimi-Ardabili et al., 2018).

Hypothesis One. Participants in the intervention condition will demonstrate significantly greater improvements in self-compassion than the active control.

Hypothesis One A. After screening the study sample for individuals with low levels of intuitive eating, participants in the intervention condition will demonstrate significantly greater improvements in self-compassion than the active control.

Hypothesis Two. Participants in the intervention condition will demonstrate significantly greater improvements in body image, intuitive eating, internalized weight bias, and disordered eating than the active control.

Hypothesis Two A. After screening the study sample for individuals with low levels of intuitive eating, participants in the intervention condition will demonstrate significantly greater improvements in body image, intuitive eating, internalized weight bias, and disordered eating than the active control.

Hypothesis Three. Women will demonstrate significantly greater improvements in self-compassion, body image, intuitive eating, internalized weight bias, and disordered eating than men.

Specific Aim Two

The second aim of this study was to examine mediators of change. Prior research has highlighted the similarities between self-compassion and psychological flexibility (Neff & Tirch, 2013). However, rather than altering or avoiding aversive thoughts and feelings, increasing the flexibility in which individuals relate to such experiences is likely to promote more adaptive and

flexible ways to pursue goals that are consistent with personal values (Hayes et al., 2006). Self-compassion has been suggested as a central component of interventions that seek to increase psychological flexibility (Hayes, 2008). Additionally, intuitive eating has been highlighted as a flexible approach to managing values related to food and health (Schoenefeld & Webb, 2013). Moreover, psychological flexibility has shown to mediate changes in self-compassion, general psychological distress, depression, anxiety, and stress following a brief ACT intervention targeting self-compassion (Yadavia et al., 2014).

Hypothesis Four. Improvements from pre- to post-intervention will be mediated by increases in psychological flexibility as well as self-compassion.

Specific Aim Three

The third aim of this study was to examine fear of self-compassion as a moderator. Fear of self-compassion is associated with self-coldness, self-criticism, and anxious and depressive symptoms (Gilbert et al., 2011) as well as difficulties with mindfulness (Gilbert et al., 2012). These findings are likely to interfere with interventions designed to increase self-compassionate behaviors. For example, in a longitudinal study in an eating disorder sample, self-compassion and fear of self-compassion interacted such that fear of self-compassion predicted less improvements in eating pathology severity and body shame that were exhibited by patients low in fear and high in self-compassion (Kelly et al., 2012). Additionally, self-compassion and fear of self-compassion predicted less than 40% of the variance in the sample, and the authors concluded that these are distinguishable constructs and should be targeted separately.

Hypothesis Five. Individuals reporting higher fear of self-compassion will demonstrate fewer improvements in all measured outcomes compared to those lower in fear of self-compassion.

Methods

Participants

This study used a convenience sample comprised of undergraduate men and women students currently enrolled in an introductory psychology course at East Carolina University (see Statistical Analysis Plan for power analysis). The original study sample consisted of 1023 individuals (64% women) with a body mass index (BMI) of 14.9 to 59.9 (M_{BMI} = 24.7, SD_{BMI} = 5.9). Participants identified as white (67.4%), black/African American (18.2%), Hispanic/Latinx (8.1%), and Asian (3.7%) with an age range from 18 to 52 years (M_{age} = 18.9, SD_{age} = 2.94). Of the individuals who participated in the study, 651 completed the baseline survey online only, 262 completed baseline and intervention, and 101 participants completed all study components. Completers of all study components were primarily women (71%) with an average age of 19.3 (SD_{age} = 4.75) and an average BMI of 24.23 (SD_{BMI} = 5.6). Participants identified as white (71%), black/African American (10.3%), Hispanic/Latinx (10.3%), and Asian (6.5%). Inclusion criteria included age 18 years or older and current enrollment in an introductory psychology course. Although the original study methodology proposed screening individuals based on levels of intuitive eating, body dissatisfaction, and desire to change one's body, inclusion criteria was altered to include all individuals within the study procedure. Post-hoc analyses were conducted to examine differences between conditions and across time after screening for levels of intuitive eating (see Hypotheses 1A and 2A in the Results section). Following completion of each portion of the study, participants were provided with mental health resources on campus (e.g., PASS Clinic, Center for Counseling and Student Development) in the event they experienced distress related to study content.

Procedure

Participants were recruited online through the SONA system to ensure they were enrolled in an introductory psychology course. The study was advertised as a self-compassionate approach to eating, weight, and muscularity and was delivered in three increments (see Figure 5 for study flow and assessment schedule) through the online platform Qualtrics (Provo, UT, 2021). Informed consent was completed online prior to the first part of the study in which participants were required to select "I agree" to participate in order to proceed with the study. Immediately following consent, the first part of the study consisted of baseline measurements in order to assess pre-intervention functioning and characteristics. Participants were asked to wait one-week (seven days) between each part of the study. The SONA system did not allow for restricting access to parts of the study by date or timeline. Thus, participants who failed to wait the requested time between study parts were screened following completion of data collection. For the second part of the study, participants were randomized between the treatment condition and the control condition at a 2:1 ratio. Participants then completed approximately one-hour of content within the condition they were randomized followed by post-intervention measures to detect changes from baseline. The randomization ratio was selected to have an adequate power for making comparisons between groups while simultaneously having sufficient power for examining mediation and moderation within the treatment condition (see Statistical Analysis Plan for power analysis). The third and final part of the study consisted of a third iteration of measures one-week following the intervention to assess changes in variables of interest. Consistent with previous research (Yadavia et al., 2014), this assessment schedule allowed for examination of the effects shortly following the intervention as well as over an extended period of time. Participants who completed the baseline assessment were provided one research credit.

Individuals who completed the intervention portion of the study were provided an additional two research credits for their participation, regardless of condition, and one research credit was provided for completion of the follow-up assessment. Thus, all participants were eligible to earn four research credits in total for full participation in the study. Additionally, two participants were selected at random to receive one of two $25 gift cards for participation, an incentive that was offered to participants to help mitigate attrition that may have been influenced by the academic calendar (i.e., follow-up after the end of the semester).

Measures

All measures will be administered at baseline, post-intervention, and follow-up, with the exception of the demographic measures and questions regarding perceptions of the intervention (see Figure 5 for study flow and assessment schedule).

Demographics

Participants will complete demographic questions assessing age, sex, gender, race/ethnicity, and self-reported height and weight. Questions will also assess whether they are current trying to lose weight, desire for weight loss, motivation for weight loss.

Eating Behaviors

Participants completed the Intuitive Eating Scale-2 (IES-2) which is a 23-item self-report measure of intuitive eating behaviors (Tylka & Kroon Van Diest, 2013). Responses were provided on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). The IES-2 produces a total score as well as four subscales that correspond to the core tenets of intuitive eating: unconditional permission to eat (UPE), eating for physical rather than emotional reasons (EPR), reliance on hunger and satiety cues (RHSC), and body-food choice congruence (B-FCC).

Internal consistency for men and women, respectively across three studies were .89 and .86 for the total score, .82 and .79 for UPE, .92 and .93 for EPR, .88 and 86 for RHSC, and .84 and .87 for B-FCC. Three-week test-retest reliability for the IES-2 total score was .88 among women and .92 for men, .86 among women and .89 among men for UPE, .81 among women and .84 among men for EPR, .80 among women and .90 among men for RHSC, and .77 among women and .75 among men for B-FCC. Internal consistency in the current study for the total scale was good for men ($\alpha = .83$) and women ($\alpha = .85$).

The IES-2 demonstrated good construct validity among men and women; the total score had a strong negative association with eating disorder symptomatology and body shame as well as moderate to strong negative relationships with internalization of media appearance ideals, poor interoceptive awareness, body surveillance, negative affect, and BMI (Tylka & Kroon Van Diest, 2006). The IES-2 total score had a strong positive link to body appreciation and moderate to strong associations with self-esteem, positive affect, and life satisfaction. The IES-2 demonstrated discriminant validity, in which the total score and all subscales were either unrelated or negligibly related (i.e., r around .10) with a measure of social desirability. Examination of incremental validity demonstrated that IES-2 scores are distinct from low levels of eating disorder symptomatology and predicted unique variance in self-esteem, positive affect, negative affect, and life satisfaction in men and women.

Participants also completed the Dutch Eating Behavior Questionnaire (DEBQ), a 33-item self-report measure that assesses disordered eating behaviors (van Strien et al., 1986). The DEBQ produces subscales for restrained, emotional (diffuse emotions and clearly labelled emotions), and external eating, in which participants indicate the frequency of those behaviors from 1 (never) to 5 (very often), with higher scores reflecting greater disordered eating. Further

research has validated these three distinct dimensions of eating style (Wardle, 1987). Internal consistency is excellent for the restrained eating (α = .95) and emotional eating (α = .94) subscales and adequate for the external eating subscale (α = .80; van Strien et al., 1986). The current study demonstrated similar internal consistency for restrained eating (α = .93), emotional eating (α = .95), and external eating (α = .82).

Research has shown that all subscales of the DEBQ are associated with disordered eating and higher BMI (Davis et al., 2006; Mason & Lewis, 2014) as well as poorer psychological functioning (Ouwens et al., 2009). Additionally, research has confirmed the ecological validity of the DEBQ, highlighting an association between the emotional eating subscale and more negative and less positive affect before eating in the natural environment (Mason et al., 2019). Additionally, the external eating subscale was associated with greater pre-eating episode expectations about the taste of food but not post-eating episode enjoyment of the food, and the restraint eating subscale was positively linked to pre-eating episode intention to eat less to lose weight or to avoid gaining weight.

Body Image

Participants completed the Body Appreciation Scale-2 (BAS-2) which is a 10-item self-report measure used to assess participants' acceptance of, favorable opinions toward, and respect for their bodies (Tylka & Wood-Barcalow, 2015). Participants responded on a 1 (Never) to 5 (Always) scale to questions regarding respect, comfort, appreciation, and attitude towards one's body. Items were summed then averaged, with higher scores indicating higher levels of body appreciation. Internal consistency is excellent for men (α = .93) and women (α = .94). In the current study, internal consistency is excellent (α = .96). The BAS-2 has demonstrated strong construct validity and is positively correlated with measures of intuitive eating ($r = .46$, $p < .001$)

as well as appearance evaluation ($r = .80$, $p < .001$) and is negatively related to internalized of media appearance ideals ($r = -.53$, $p < .001$), body fat dissatisfaction ($r = -.65$, $p < .001$), and muscularity dissatisfaction ($r = -.31$, $p < .001$; Tylka & Wood-Barcalow, 2015). Additionally, body appreciation is linked to self-compassion ($r = .72$, $p < .01$) and has been shown to increase in self-compassion interventions (Albertson et al., 2014).

Participants also completed the Muscle Dysmorphic Disorder Inventory (MDDI), a 13-item self-report measure of muscle dysmorphia symptoms (Hildebrandt et al., 2004). The MDDI was included in order to capture body image outcomes for individuals who may internalize muscular ideals rather than thin ideals. The MDDI includes subscales for drive for size (e.g., thoughts of being smaller, less muscular, and weaker than desired, or desire to increase size and strength), appearance intolerance (e.g., negative beliefs about one's body contributing to appearance anxiety or body exposure avoidance), and functional impairment (e.g., behaviors related to maintaining exercise routines, discomfort related to deviating from exercise routines, or avoidance related to negative feelings and preoccupation with one's body). Participants reported the frequency of cognitions and behaviors related to muscle dysmorphia on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). Items were summed to produce subscale scores whereas a total score is derived from the sum of subscale scores.

The MDDI has demonstrated good internal consistency for the drive for size ($\alpha = .85$), appearance intolerance ($\alpha = .77$), and functional impairment ($\alpha = .80$) subscales, as well as the MDDI total score ($\alpha = .81$) among a sample of men with at least six-months of weightlifting experience (Hildebrandt et al., 2004). Reliability was confirmed in a German sample of men and women: $\alpha = .84$ for drive for size, $\alpha = .83$ for appearance intolerance, $\alpha = .81$ for functional impairment, and $\alpha = .75$ for MDDI total score (Zeeck et al., 2018). Internal consistency in the

current study was adequate for the total scale (α = .79). Test-retest reliability across a two-week period is good (r = .87; Hildebrandt et al., 2004). The MDDI and its subscales have demonstrated convergent validity with body dissatisfaction, bulimic symptoms, and social physique anxiety (Hildebrandt et al., 2004) as well as divergent validity with body acceptance (Zeeck et al., 2018). Examination of gender differences found that men scored higher than women on drive for size while women scored higher on appearance intolerance, although functional impairment and MDDI total scores did not differ. Further, men (25%) were more likely to meet criteria for "at risk" for muscle dysphoria compared women (16%) when using a cutoff score of 39 for the MDDI total score.

Participants also completed the modified Weight Bias Internalization Scale (WBIS-M) which is an 11-item measure that assesses the degree to which an individual internalizes stigmatizing attitudes towards people because of their weight and body (Pearl & Puhl, 2014). The WBIS – M is an adapted version of the original WBIS (Durso & Latner, 2008) that alters the wording to be inclusive of individuals who do not identify as overweight or obese (e.g., "I feel anxious about my weight because of what people might think of me"). Participants indicated their level of agreement on 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), with higher scores reflecting greater internalized weight bias. In a weight diverse sample of men and women, the mean score was 3.27 (SD = 1.50) with good internal consistency (α = .94; Pearl & Puhl, 2014). The WBIS-M demonstrated good internal consistency in the current study as well (α = .95). The WBIS – M is positively associated with psychological distress, positive body image, drive for thinness, and weight stigma and negatively related with self-esteem.

Self-Compassion

Participants completed the Self-Compassion Scale (SCS), a 26-item self-report measure of self-compassion (Neff, 2003b). Response options are rated on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). The SCS produces a total score that has shown to account for approximately 90% of the variances associated with a general self-compassion factor (Neff et al., 2017). This measure also consists of six subscales that correspond to the three central components of self-compassion and can be examined separately: self-kindness (e.g., I'm kind to myself when I'm experiencing suffering), self-judgment (e.g., when times are really difficult, I tend to be tough on myself), common humanity (e.g., I try to see my failings as part of the human condition), isolation (e.g., when I fail at something that's important to me I tend to feel alone in my failure), mindfulness (e.g., when I'm feeling down I try to approach my feelings with curiosity and openness), and overidentification (e.g., when something upsets me I get carried away with my feelings). The SCS has demonstrated good internal consistency ($\alpha = .92$) as well as good test-retest reliability for the total score (.93) as well as for the six subscales (.80 - .88; Neff, 2003b). Validation of the SCS indicated the SCS has discriminant validity from measures of self-esteem as well as good construct validity with other scales measuring related constructs, including self-criticism and social connectedness. In the current study, internal consistency was good for the total scale ($\alpha = .91$).

Additionally, participants completed the Fear of Compassion Scales – Self (FCSelf), a 15-item self-report measure that assesses fear of expressing kindness and compassion towards oneself (Gilbert et al., 2010). Ratings were completed on a 5-point Likert scale ranging from 0 (don't agree at all) to 4 (completely agree). Validation in a college student sample demonstrated good internal consistency ($\alpha = .92$). The current study demonstrated excellent internal

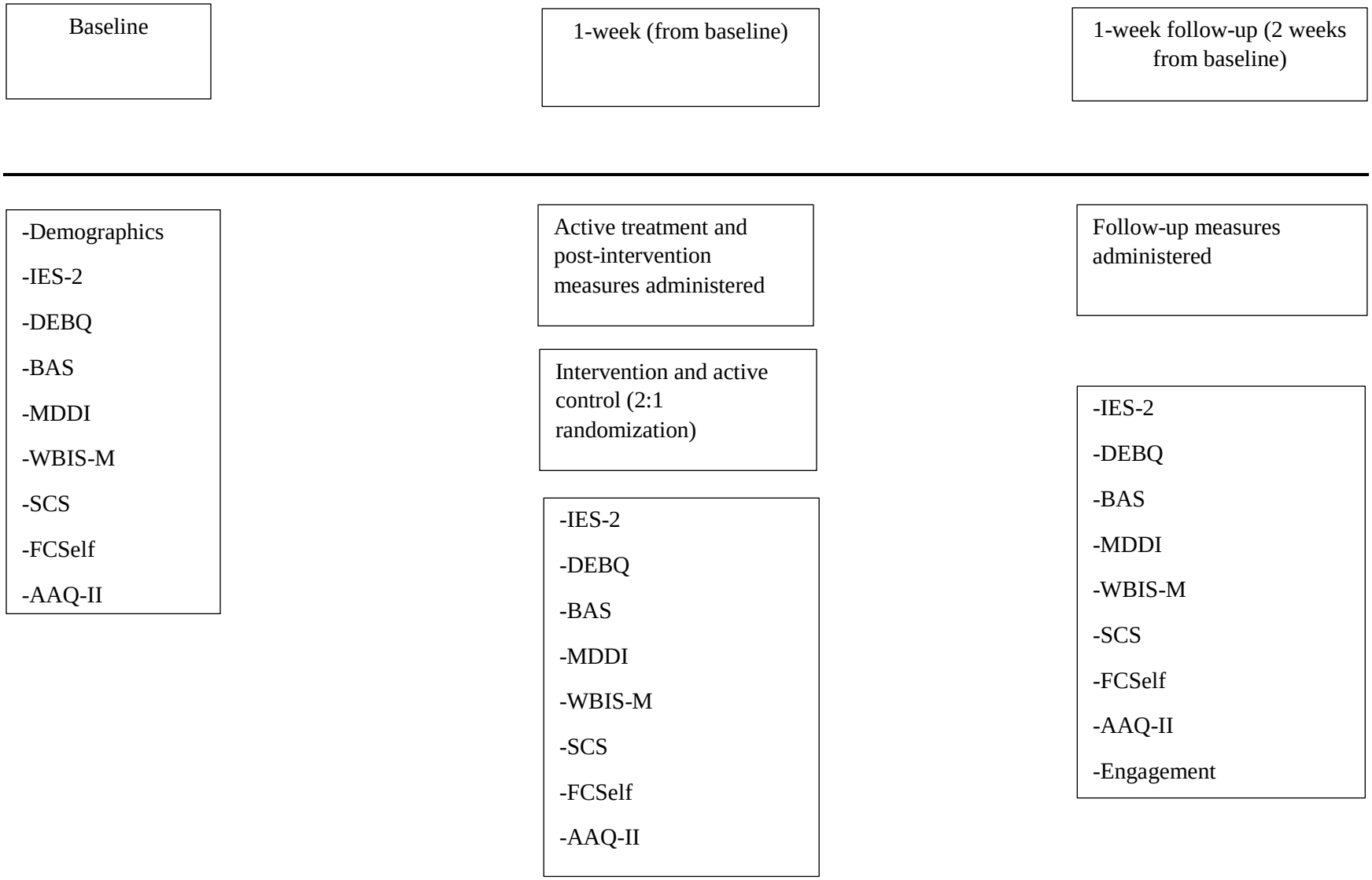


Figure 5. Study flow and assessment schedule.

consistency (α = .95). In terms of construct validity, the FCSelf demonstrated a negative association with the SCS (r = -.54, p < .001) and a positive association with measures of self-criticism, including inadequate self (r = .69, p < .001) and self-hatred (r = .59, p < .001). The FCSelf has also demonstrated a positive relationship with anxious and depressive symptoms as well as stress within a college sample.

Psychological Flexibility

Participants completed the Acceptance and Action Questionnaire – Second Edition (AAQ-II), a 7-item self-report measure of psychological inflexibility and experiential avoidance (Bond et al., 2011). Items were summed in which higher scores reflect greater levels of psychological inflexibility and greater emotional distress. Internal consistency is adequate, with a mean alpha coefficient measure across six samples of .84 (.78 - .88). The 3- and 12-month test–retest reliability is .81 and .79, respectively. Internal consistency in the current study was good (α = .94).

The AAQ-II has shown concurrent and predictive validity in a college student sample, demonstrating a significant association with the depression as measured by the Beck Depression Inventory-II (BDI-II; Beck et al., 1996; r = .71), anxiety measured by the Beck Anxiety Inventory (BAI; Beck & Steer, 1990; r = .61), and overall psychological distress measured by the Global Severity Index of the Symptom Checklist-90-Revised (SLC-90-R-GSI; DeRogatis, 1992; r = .70). Convergent validity was demonstrated with the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994; r = .63), a measure of thought suppression indicative of psychological inflexibility involving a subset of internal events (e.g., thoughts) rather than all internal events (e.g., emotions, sensations) captured by the AAQ-II. Predictive validity was also demonstrated through comparison of the AAQ-II between nonclinical samples and a sample

seeking substance use treatment; the treatment seeking population (M = 28.34; SD = 9.92) demonstrated significantly higher scores than the nonclinical samples (M = 18.51; SD = 7.05), with a very large effect size (d = 1.12).

Engagement, Acceptance, and Usefulness

Participants also completed six self-report items assessing engagement, acceptability, and usefulness of the intervention adapted from Mitchell and colleagues (2018). Items were administered at follow-up to examine the frequency of use of intervention resources (item 1), and if not, what barriers prevented them from doing so (item 2; e.g., too pressed for time; did not think it would be useful; did not need to–already self-compassionate; not comfortable with self-compassion exercises; already using different strategies/resources/ other), whether participants think they have become more self-compassionate (item 3), whether they thought self-compassion was helpful for coping with body image concerns (item 4) and eating behaviors (item 5), and if they would recommend self-compassion to others (item 6).

Intervention

The purpose of the intervention is to teach self-compassion skills that will positively influence body image and eating behaviors in daily life. Consistent with prior research, self-compassion interventions hold promise for increasing adaptive eating behaviors and well-being via body orientation (Augustus-Horvath & Tylka, 2011). The current study consisted of a brief, one-hour self-compassion intervention delivered online in a self-paced format that was adapted from existing self-compassion interventions. Of note, the originally proposed intervention was intended to be delivered in an in-person format to increase engagement, validation of the pervasive and accepted nature of self-criticism, and experiential learning. The online format was

used to circumvent restrictions during the onset and height of the COVID-19 pandemic. The duration of the intervention is derived from literature highlighting the efficacy of single self-compassion exercises and brief, one- and two-week self-compassion interventions. Additionally, the length of the proposed intervention was designed to substantially reduce participant burden while incorporating skills highlighted throughout the literature that have shown to positively impact body image and eating behaviors. Specifically, a one-week self-compassion intervention comprised of 20-minute daily meditation decreased self-criticism and increased body appreciation (Toole & Craighead, 2016). Of note, this study did not inform participants that the intervention targeted self-compassion or body image concerns. Another brief, online intervention consisting of two videos, education on techniques for being more compassionate to oneself, and guided exercises demonstrated significant improvements in self-compassion and body image (Mitchell et al., 2018). Lastly, self-compassionate writing exercises (e.g., 3 – 4 minutes) following mood-induction and body dissatisfaction tasks have produced greater improvements in mood as well as lower weight dissatisfaction and appearance dissatisfaction, respectively (Moffitt et al., 2018; Odou & Brinker, 2014).

Research has highlighted that brief exposure to self-compassion training may produce measurable differences in thoughts, feelings, and behaviors towards oneself and one's body (Mitchell et al., 2018). The content for the current intervention was adapted from the Mindful Self-Compassion program (MSC; Neff & Germer, 2013) and incorporated exercises from the literature that have specifically targeted body image and eating behaviors. The intervention was comprised of three main components: psychoeducation, experiential exercises, and guided mindfulness practice. Home-practice and tips for implementing exercises were also provided at the conclusion of the study. Home-practice is commonly used in self-compassion interventions

in order to facilitate learning and increased kindness towards oneself (Germer & Neff; 2013; Neff & Germer, 2013; Toole & Craighead, 2016). See Appendix B for an outline of the intervention. The intervention was delivered through the online platform, Qualtrics (Provo, UT, 2021) which encompasses randomization and custom ratios to meet study needs (i.e., 2:1 intervention to control). This format enabled the intervention to be self-paced while providing content through written, visual, and audio. Additionally, Qualtrics provides opportunities for open-ended responses to introspective and self-reflective questions originally designed for the in-person intervention.

Psychoeducation

Education is considered the starting point for self-compassion programs (Neff & Germer, 2013). The introduction to the current intervention consisted of education on what self-compassion is (e.g., self-kindness, common humanity, and mindfulness) and how it influences our well-being as well as the effects of self-criticism and benefits of self-compassion. Myths and misconceptions surrounding self-compassion were also discussed to highlight the differences between self-esteem, self-pity, and self-compassion. Education was also provided on the importance of mindfulness in treating oneself compassionately as well as how the mind naturally attends to past and future oriented problems (Germer & Neff, 2013). Study participants were informed about the potential discomfort that may arise while engaging in mindfulness practice and developing kindness and compassion towards oneself (Neff & Germer, 2018).

Experiential Exercises

According to experiential learning theory, knowledge is created from the combination of grasping and transforming experience through interactive transactions between the person and

their environment (Kolb, 1984). Third-wave cognitive behavioral therapies are abundant in experiential exercises to increase learning among clients and patients, among which self-compassion programs are primarily experiential in nature (Germer & Neff, 2013). Thus, the current intervention is comprised of various experiential exercises to facilitate participant learning.

The first experiential exercise is a contemplative exercise that was introduced during the psychoeducational portion of the intervention (Gilbert, 2006; Germer & Neff, 2013). This exercise asked participants to reflect on how they would respond to a loved one during a time of suffering and contrast that with how they respond to themselves during struggles. This exercise was designed to increase awareness of self-directed critical thoughts. A self-compassion writing exercise was also incorporated that includes three parts (Neff & Germer, 2018). Part one consisted of identifying imperfections that make participants feel inadequate. Part two consisted of writing a letter to oneself from the perspective of an unconditionally loving imaginary friend. Part three included a brief reflection of the compassionate letter and how such compassionate words may influence internal experiences.

Guided Mindfulness Practice

Mindfulness is one of the three core components of self-compassion and is posited as one of the primary pathways for increasing self-compassion (Neff, 2003a; Neff & Germer, 2013). The Self-Compassion Break Guided Meditation was introduced during the psychoeducational/introduction portion of the intervention in order to highlight the three components of self-compassion (i.e., self-kindness, common humanity, and mindfulness; Germer & Neff, 2013). This short exercise encourages identification of compassionate phrases that can be repeated during times of emotional distress to disengage from rumination and sooth oneself.

The Compassionate Body Scan was also introduced in order to increase body awareness and promote body acceptance (Germer & Neff, 2013; Toole & Craighead, 2016).

Control Condition

To better understand the effectiveness of the self-compassion intervention on eating behaviors and body image, an active control group was developed for comparison of changes in study variables over time. The active control content was comprised of information pertaining to self-care adapted from empirically-supported approaches to creating sustainable behavioral change (Dubar-Jacob, 2007). Specifically, there were modules covering the body's stress response, nutrition, exercise, and sleep. Education was provided on how the body responds to stress as well as the role of self-care in reducing demands and threats on the body. Related to nutrition, participants were provided with information on the benefits of healthy eating, optimal nutritional foods, foods to limit for health weight management, and recommendations for making nutritional changes (e.g., start with small changes, plan ahead, limiting distractions while eating, reducing the frequency of skipped meals, and finding enjoyment in food). The exercise portion consisted of education on the benefits of exercise on well-being, activities to increase exercise (e.g., swimming, walking, dancing, hiking), and recommendations for incorporating greater levels of physical activity into daily life (e.g., setting goals, tracking exercise, including friends and family). The final section discussed the benefits of quality sleep, factors affecting sleep, and recommendations for improving sleep (e.g., avoiding naps later in the day, avoiding caffeine and alcohol close to bedtime, limiting nonsleep related activities in bed, creating a bedtime routine, and establishing a supportive sleep environment). The active control group completed an overall personal self-care assessment (e.g., "Please indicate how well you are doing in each of the areas (e.g., sleep, nutrition, exercise, alcohol, relationships) by placing a self-rating of their current

self-care, ranging from 1 [poor] to 5 [excellent]") as well as an assessment in each topic area covered within the content (e.g., "Before we discuss sleep, let's do a quick assessment of how you are doing in this area. How many hours of sleep do you get per night on average?").

Statistical Analysis Plan

Analyses were conducted in SPSS 27 (IBM Corp., 2021). All study variables were treated as continuous with the exception of gender (dichotomous; no study participants identified as gender nonbinary) and race/ethnicity. A priori power analyses using G-Power indicated that a sample of 120 participants will provide 95% power or greater to detect a medium effect size using repeated measures analysis of variance and multiple linear regression. Medium effect sizes have previously been observed in other brief self-compassion interventions (e.g., Moffitt et al., 2018; Smeets et al., 2014). Prior research has indicated that a sample size of 78 is sufficient for detecting small interaction effects on an independent variable (Shieh, 2011). For hypotheses one, two, and three, analyses were conducted in a two-part process. Specifically, repeated measures analysis of variance was used across baseline and post-intervention (i.e., 2x2) as well as across baseline, post-intervention, and follow-up (i.e., 2x3). This was conducted in order to examine the effects of the intervention among completers across all three time points as well as to examine the effects of the intervention immediately following the treatment. This provided increased power for examining the immediate effects of the intervention using a greater sample size due to reduced participation at follow-up (see below for further details on study flow).

Results

Overall, 1023 individuals signed informed consent and participated in the study. Of the 362 participants who completed baseline and post-intervention time points, 49 cases were excluded due to being invalid (i.e., failed to answer two of four validity questions correctly and failed to wait at least 5 days between each time point). In total, 101 participants completed all parts of the study (i.e., baseline, intervention or active control, and follow-up). Of the 101 participants, 2 were excluded from analyses due to invalid responding, resulting in a final sample of 99 participants across all time points. See Figure 6 for study flow. There were no significant differences at baseline between participants in the intervention and active control conditions on gender, $\chi^2(2) = .915$, $p = .633$), race, $\chi^2(6) = 5.18$, $p = .520$), and other key variables (see Table 1). Likewise, there were no significant differences at baseline between participants who completed the

Table 1. Comparisons between intervention and control group on key variables

Variable	Intervention		Control		*F*	*p*
	M	SD	M	SD		
Age	19.35	3.96	18.94	3.67	.785	.376
BMI	24.95	6.37	24.69	5.49	.129	.720
SCS	3.01	.70	3.06	.67	.185	.383
IES	3.43	.51	3.41	.53	.089	.765
RES	2.53	.95	2.36	.81	2.64	.105
EMOT	2.38	.90	2.37	1.01	.003	.960
EXT	3.19	.60	3.21	.63	.036	.849
WBIS	3.31	1.61	3.11	1.51	1.14	.285
BAS	3.48	.97	3.64	.97	1.99	.159
MDDI	24.73	7.50	24.89	7.68	.034	.854
FCSelf	17.77	13.34	17.08	12.38	.194	.660
AAQ	22.84	11.11	22.31	10.88	.165	.685

Note. All ANOVAs conducted with 311 degrees of freedom. BMI = Body Mass Index SCS = Self-Compassion Scale, IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II.

intervention (i.e., completed baseline, post-intervention, and follow-up) compared to those who did not complete the intervention (gender, $\chi^2[2] = 1.91$, $p = .383$, and race, $\chi^2[6] = 4.05$, $p = .669$). Differences between completion status are located in Table 2. Finally, there were no statistical differences in completion between treatment condition, $\chi^2(1) = .830$, $p = .393$.

Table 2. Comparisons between completers and noncompleters on key variables

Variable	Completers		Noncompleters		*F*	*p*
	M	SD	M	SD		
Age	19.37	4.75	19.09	3.26	.373	.542
BMI	24.22	5.59	25.13	6.19	1.62	.204
SCS	3.02	.74	3.03	.66	.013	.910
IES	3.45	.55	3.40	.51	.535	.465
RES	2.47	.86	2.47	.92	.000	.996
EMOT	2.36	.93	2.40	.95	.120	.729
EXT	3.19	.64	3.20	.59	.054	.816
WBIS	3.23	1.60	3.24	1.56	.003	.959
BAS	3.59	1.00	3.52	.96	.432	.511
MDDI	24.43	7.29	24.86	7.63	.224	.637
FCSelf	17.69	14.48	17.54	12.42	.008	.927
AAQ	22.48	11.94	22.79	10.62	.056	.814

Note. All ANOVAs conducted with 311 degrees of freedom. BMI = Body Mass Index SCS = Self-Compassion Scale, IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II.

Correlations among Study Variables

Prior to running analyses associated with study hypotheses, the relationships between baseline self-compassion and intuitive eating, disordered eating (e.g., restrained eating, emotional eating, and external eating), internalized weight bias, body appreciation, muscle dysmorphia, fear of self-compassion, and psychological inflexibility were examined among participants who completed all study components (i.e., completers). See Table 3 for descriptive statistics of key variables and Pearson correlations among variables. There was a strong positive relationship between self-compassion and body appreciation and a moderate positive relationship with intuitive eating. There was a strong negative relationship between

self-compassion and psychological inflexibility, internalized weight bias, and fear of self-compassion as well as a moderate negative relationship with restrained eating, emotional eating, external eating, and muscle dysmorphia. There was a strong positive correlation between intuitive eating and body appreciation. Intuitive eating had a strong negative relationship with emotional eating and internalized weight bias and a moderate negative relationship with psychological inflexibility, restrained eating, muscle dysmorphia, and fear of self-compassion. There was a weak negative correlation between intuitive eating and external eating.

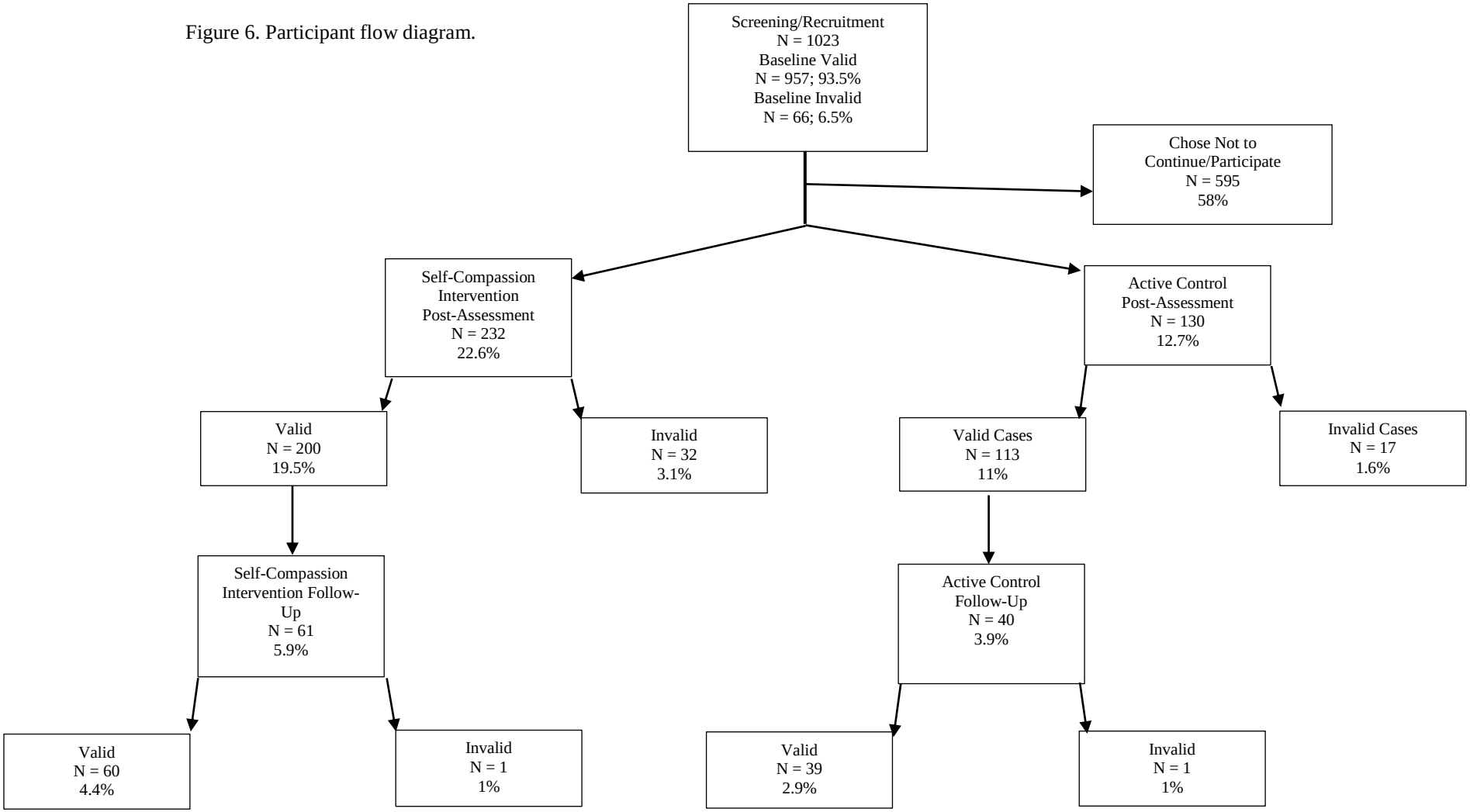
Hypothesis 1

A 2x2 repeated measures analysis of variance (RANOVA) was employed to determine the effects of the intervention on levels of self-compassion between intervention and an active control across baseline and post-intervention. Use of RANOVA enables investigation of mean scores over two or more time points (e.g., baseline, post-intervention) between two or more conditions (Kerlinger, 1986). Differences between-subjects (condition) and within-subjects (time) were examined as well as the interactive effect of time on condition. There was no difference in self-compassion across time, $F(1) = 2.53$, $p = .112$, $\eta^2 = 0.008$, between conditions, $F(1) = 1.11$, $p = .292$, $\eta^2 = 0.004$, or interaction between time and condition, $F(1) = 2.25$, $p = .134$, $\eta^2 = 0.007$. A 2x3 RANOVA examined differences in self-compassion across all three time points (i.e., baseline, post-intervention, follow-up). There were no differences in self-compassion across time, $F(1) = 2.05$, $p = .137$, $\eta^2 = 0.021$, between conditions, $F(1) = 1.24$, $p = .268$, $\eta^2 = 0.013$, or interaction between time and condition, $F(1) = 0.91$, $p = .394$, $\eta^2 = 0.009$.

Hypothesis 1A

The current study enabled all individuals to participate in the study given they met identified inclusion criteria (e.g., 18 years or older, currently enrolled in an introductory

Figure 6. Participant flow diagram.



Note. Reasons for invalid response include failure to adhere to time frame between study time points (i.e., greater than 4 days) or failure to accurately answer two or more validity questions (e.g., please select 'seldom' for this question). Percentage denoted is from participant sample at baseline (N = 1023).

Table 3. Descriptive statistics and Pearson correlations of key study variables on completers

Variable	*Current M(SD)*	*Reference M(SD)*	1	2	3	4	5	6	7	8	9
1. SCS	3.03(.73)	2.44(.62)[1]	-								
2. IES	3.44(.56)	3.36(.56)[2]	.46*	-							
3. RES	2.49(.89)	2.21(.92)[3]	-.32**	-.43**	-						
4. EMOT	2.33(.94)	1.90(.60)[3]	-.44**	-.62**	.36**	-					
5. EXT	3.17(.68)	2.73(.56)[3]	-.31**	-.23*	.17	.55**	-				
6. WBIS	3.25(1.59)	3.27(1.50)[4]	-.69**	-.59**	.60**	.50**	.31**	-			
7. BAS	3.56(1.02)	3.82(.72)[5]	.63**	.55**	-.39**	-.30**	-.05	-.80**	-		
8. MDDI	24.31(7.31)	31.2(8.58)[6]	-.50**	-.33**	.40**	.35**	.28**	.67**	-.62**	-	
9. FCSelf	17.55(14.40)	15.26(9.61)[7]	-.68**	-.39**	.45**	.35**	.22*	.58**	-.50**	.47**	-
10. AAQ	22.45(11.90)	25.40(9.41)[1]	-.74**	-.47**	.41**	.47**	.33**	.66**	-.56**	.58**	.70**

Note. N = 99 for all variables. * denotes significance at the .05 level. ** denotes significance at the .01 level. SCS = Self-Compassion Scale, IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. [1] = Yadavia et al., 2014, [2] =Tylka, 2006, [3] = van Strien et al., 1986, [4] = Pearl & Puhl, 2014, [5] = Tylka & Wood-Barcalow, 2015, [6] = Klimek et al., 2017, [7] = Gilbert et al., 2012.

post-hoc, and analyses were conducted in order to determine whether baseline levels of intuitive eating predict greater success following the intervention compared to an active control group. The cutoff for intuitive eating was drawn from prior research delivering a sensory-based intervention among restrained eaters (Gravel et al., 2014). Of note, participants were also screened for levels of baseline self-compassion post-hoc, and there were no differences in outcomes between screening of intuitive eating and self-compassion. A 2x2 RANOVA was conducted among individuals with lower baseline intuitive eating. There were no differences in self-compassion across time, $F(1) = 0.17$, $p = .673$, $\eta^2 = 0.002$, between conditions, $F(1) = 0.24$, $p = .625$, $\eta^2 = 0.003$, or interaction between time and condition, $F(1) = 0.37$, $p = .543$, $\eta^2 = 0.005$. A 2x3 RANOVA examined differences in self-compassion across all three time points. There were no differences in self-compassion across time, $F(1) = 1.75$, $p = .195$, $\eta^2 = 0.085$, between conditions, $F(1) = 0.001$, $p = .973$, $\eta^2 = <0.001$, or interaction between time and condition, $F(1) = 0.33$, $p = .655$, $\eta^2 = 0.017$.

Hypothesis 2

The effects of the intervention on other outcome variables were examined using a 2x2 RANOVA. The results are presented in Table 4. There were significant decreases in external eating, internalized weight bias, and muscle dysmorphia between baseline and post-intervention with small effects. There were significant between-subjects effects for fear of self-compassion with a small effect. The between-subjects results indicated that participants in the control condition showed lower levels of fear of self-compassion compared to participants in the intervention. Furthermore, there were significant interactions between time and condition among internalized weight bias, fear of self-compassion, and muscle dysmorphia, all with small effect sizes. For internalized weight bias, there was a main effect for time, $F(1, 304) = 4.39$, $p = .037$,

$\eta^2 = 0.014$, with internalized weight bias decreasing between baseline ($M = 3.2$, SD = .09) and post-intervention ($M = 3.1$, $SD = .09$). For participants in the control condition, internalized weight bias decreased between baseline ($M = 3.1$, $SD = .15$) and post-intervention ($M = 2.9$, $SD = .14$), $F(1, 304) = 9.102$, $p = .003$, $\eta^2 = 0.029$. Related to muscle dysmorphia, there was a main effect for time, $F(1, 311) = 4.01$, $p = .046$, $\eta^2 = 0.013$, with muscle dysmorphia increasing between baseline ($M = 24.8$, SD = .45) and post-intervention ($M = 25.4$, $SD = .46$). Simple effects existed for the intervention group, $F(1, 311) = 25.00$, $p < .001$, $\eta^2 = 0.074$, with an increase in muscle dysmorphia between baseline ($M = 24.7$, SD = .54) and post-intervention ($M = 26.4$, SD = .55). For fear of self-compassion, there was a main effect for condition, $F(1) = 5.65$, $p = .018$, $\eta^2 = 0.018$, with significantly higher fear of self-compassion in the intervention group ($M = 19.8$, SD = .89) than the control group ($M = 16.3$, SD = 1.2). For the intervention group, there was a significant an increase in fear of self-compassion between baseline ($M = 17.8$, SD = .93) and post-intervention ($M = 21.9$, SD = 1.0), $F(1, 311) = 26.07$, $p < .001$, $\eta^2 = 0.077$.

Next, 2X3 RANOVAs were conducted in order to examine the effects of the intervention compared to active control on outcome variables across all three time points. Results are reported in Table 5. There were significant differences across time with small effects for intuitive eating and external eating. Intuitive eating increased across time whereas external eating decreased across time. There were no significant differences between conditions across all three time periods. There were significant interactions for internalized weight bias and muscle dysmorphia. For internalized weight bias, the main effects for time, $F(2, 96) = .741$, $p = .480$, $\eta^2 = 0.016$, and condition, $F(2, 96) = .242$, $p = .624$, $\eta^2 = 0.003$, for were not significant. Regarding simple effects, there was a significant difference across time for the intervention group, $F(2, 96) = 3.71$, $p = .028$, $\eta^2 = 0.075$, with levels of internalized weight bias at post-intervention ($M = 3.4$, SD =

.21) significantly higher than baseline (M = 3.2, SD = .22, p = .03) and follow-up (M = 3.2, SD = .21, p = .04). In contrast, participants in the control condition demonstrated the opposite effect, with decreased internalized weight bias between baseline (M = 3.3, SD = .26) and post-intervention (M = 3.1, SD = .26, p = .04). Related to muscle dysmorphia, there was a main effect for time, $F(2, 96) = 3.45$, p = .036, $\eta^2 = 0.067$, with muscle dysmorphia increasing between baseline (M = 24.5, SD = .77) and post-intervention (M = 25.6, SD = .83, p = .01). Regarding simple effects, the differences in muscle dysmorphia across time existed with the intervention group only, $F(2, 96) = 13.13$, $p < .001$, $\eta^2 = 0.215$, with a significant increase in muscle dysmorphia between baseline (M = 24.8, SD = .96) and post-intervention (M = 27.3, SD = 1.04, $p < .001$) as well as a decrease in muscle dysmorphia between post-intervention and follow-up (M = 25.8, SD = 1.09, p = .01).

Hypothesis 2A

Similar to hypothesis 1A, individuals were screened based on levels of intuitive eating in order to determine the effectiveness of the intervention for participants who had lower levels of intuitive eating. 2X2 RANOVAS were conducted to examine the effects of the intervention compared to active control on additional study variables among participants lower in intuitive eating. Results are reported in Table 6. There were significant moderate effects for intuitive eating and internalized weight bias across time. Participants demonstrated increased intuitive eating as well as decreased internalized weight bias between baseline and post-intervention. There were significant differences between conditions for internalized weight bias, with a moderate effect. Specifically, internalized weight bias was significantly higher among participants in the intervention compared to the control condition. There were significant

Table 4. 2x2 RANOVA on key variables

Group		IES	RES	EMOT	EXT	WBIS	BAS	MDDI	FCSelf	AAQ
Intervention	Pre	3.4 *(.51)*	2.5 *(.95)*	2.3 *(.90)*	3.1 *(.60)*	3.3 *(1.6)*	3.4 *(.97)*	24.7 *(7.5)*	17.7 *(13.3)*	22.8 *(11.1)*
	Post	3.4 *(.59)*	2.4 *(.95)*	2.3 *(.96)*	3.0 *(.67)*	3.3 *(1.5)*	3.4 *(.94)*	26.3 *(7.6)*	21.8 *(14.7)*	23.0 *(10.0)*
Control	Pre	3.4 *(.53)*	2.3 (*.81*)	2.3 *(1.0)*	3.2 (*.63*)	3.1 *(1.5)*	3.6 (*.97)*	24.8 (7.6*)*	17.0 *(12.8)*	22.3 *(10.8)*
	Post	3.4 (*.52*)	2.3 *(.84)*	2.2 *(1.0)*	3.1 (*.67*)	2.9 (*1.4*)	3.6 *(.92)*	24.3 (7.9*)*	15.4 *(14.0)*	21.6 *(10.4)*
Within	*F*	3.6	.914	2.33	11.27**	4.38*	.098	4.013*	3.47	.281
	η^2	.011	.003	.008	.037	.014	<.001	.013	.011	.001
Between	*F*	.016	2.18	.086	.117	3.11	3.18	1.13	5.65*	.625
	η^2	<.001	.007	<.001	<.001	.010	.010	.004	.018	.003
Interaction	*F*	1.53	.346	1.39	.098	7.37**	1.46	16.04***	18.24***	.928
	η^2	.005	.001	.005	<.001	.024	.005	.057	.055	.003

Note. N = 313 for all variables. Mean (*Standard Deviation*). IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. * denotes significance at the .05 level, *** denotes significance at the .001 level.

Table 5. 2x3 RANOVA on psychological measures

Group		IES	RES	EMOT	EXT	WBIS	BAS	MDDI	FCSelf	AAQ
Intervention	Pre	3.4 *(.53)*	2.4 *(.97)*	2.3 *(.94)*	3.1 *(.67)*	3.2 *(1.6)*	3.5 *(.97)*	24.8 *(7.1)*	18.2 *(15.7)*	23.6 *(12.1)*
	Post	3.5 *(.55)*	2.5 *(1.0)*	2.2 *(.95)*	3.1 *(.66)*	3.3 *(1.6)*	3.4 *(.95)*	27.2 *(8.3)*	22.8 *(16.5)*	24.2 *(10.9)*
	F/U	3.5 *(.54)*	2.4 *(1.0)*	2.2 *(.97)*	3.0 *(.76)*	3.2 *(1.5)*	3.5 *(.88)*	25.7 *(7.9)*	20.8 *(17.8)*	22.4 *(10.8)*
Control	Pre	3.4 *(.53)*	2.4 *(.72)*	2.2 *(.88)*	3.1 *(.64)*	3.2 *(1.5)*	3.6 *(1.0)*	24.1 *(7.8)*	16.0 *(12.8)*	20.1 *(11.2)*
	Post	3.6 *(.54)*	2.4 *(.78)*	2.1 *(1.0)*	3.0 *(.65)*	3.0 *(1.4)*	3.7 *(.95)*	23.8 *(7.6)*	15.9 *(15.4)*	20.3 *(10.2)*
	F/U	3.6 *(.49)*	2.3 *(.82)*	2.1 *(.94)*	2.9 *(.67)*	3.0 *(1.4)*	3.6 *(1.0)*	24.7 *(9.1)*	15.9 *(15.0)*	20.0 *(10.8)*
Within	*F*	3.33*	1.53	2.90	5.53**	.881	.550	2.33	2.07	1.21
	η^2	.033	.016	.030	.058	.009	.006	.024	.021	.012
Between	*F*	.483	.103	.462	.060	.242	.979	1.24	2.38	2.36
	η^2	.005	.001	.005	.001	.003	.010	.013	.024	.024
Interaction	*F*	.417	.122	.075	.848	3.47*	.740	4.42*	2.28	.581
	η^2	.004	.001	.001	.009	.036	.008	.044	.022	.006

Note. N = 99 for all variables. Mean (*Standard Deviation*). IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. *** denotes significance at the .001 level.

interactions between time and condition for intuitive eating, internalized weight bias, and muscle dysmorphia, all with moderate effects. For intuitive eating, there was a main effect for time, $F(1, 72) = 10.62$, $p = .002$, $\eta^2 = 0.129$, with a significant increase in intuitive eating between baseline ($M = 2.7$, $SD = .03$) and post-intervention ($M = 2.9$, $SD = .04$). The effects were significant for the control group only, $F(1, 72) = 12.22$, $p = .001$, $\eta^2 = 0.145$, with a mean difference in intuitive eating of .213 from baseline to post-intervention. Related to internalized weight bias, there were main effects for time, $F(1, 71) = 8.98$, $p = .004$, $\eta^2 = 0.112$, and condition, $F(1) = 4.95$, $p = .029$, $\eta^2 = 0.065$. Specifically, internalized weight bias decreased between baseline ($M = 4.5$, $SD = .18$) and post-intervention ($M = 4.3$, $SD = .17$), and the intervention group ($M = 4.8$, $SD = .21$) reported significantly higher levels of internalized weight bias compared to the control group ($M = 4.0$, $SD = .26$). Simple effects existed for the control group, $F(1, 71) = 11.78$, $p = .001$, $\eta^2 = 0.142$, such that internalized weight bias decreased between baseline ($M = 4.3$, $SD = .28$) and post-intervention ($M = 3.8$, $SD = .26$). For muscle dysmorphia, there were no main effects for time, $F(1, 72) = .545$, $p = .463$, $\eta^2 = 0.008$, or condition, $F(1) = .558$, $p = .388$, $\eta^2 = 0.010$. Among participants in the control condition, muscle dysmorphia decreased between baseline ($M = 30.0$, $SD = 1.5$) and post-intervention ($M = 28.0$, $SD = 1.5$), $F(1, 72) = 5.42$, $p = .023$, $\eta^2 = 0.070$.

Next, 2x3 RANOVAS were conducted in order to examine the effects of the intervention compared to active control on outcome variables across all three time points among participants lower in intuitive eating. Results are reported in Table 7. There were large effects for intuitive eating, such that intuitive eating increased across time. There were no significant

Table 6. 2x2 RANOVA on key variables, screened for intuitive eating

Group		IES	RES	EMOT	EXT	WBIS	BAS	MDDI	FCSelf	AAQ
Intervention	Pre	2.7 (*.23*)	3.1 *(.90)*	3.3 *(.74)*	3.4 *(.58)*	4.8 *(1.2)*	2.6 *(.72)*	29.9 *(7.5)*	26.5 *(12.8)*	31.8 *(9.8)*
	Post	2.7 *(.36)*	3.0 (*.89*)	3.3 *(.86)*	3.3 (*.56*)	4.7 (*1.2*)	2.6 *(.64)*	31.1 *(7.4)*	31.0 *(12.2)*	31.3 *(9.0)*
Control	Pre	2.7 *(.25)*	2.8 (*.88*)	3.2 *(1.0)*	3.5 (*.55*)	4.2 *(1.7)*	2.9 (*.98)*	29.9 (*8.3)*	25.2 *(14.4)*	27.4 *(11.6)*
	Post	2.9 (*.36*)	2.8 *(.90)*	3.1 *(1.0)*	3.3 (*.50*)	3.8 (*1.6*)	3.0 *(.93)*	27.9 (*8.4*)	24.7 *(16.4)*	27.1 *(12.4)*
Within	*F*	10.61**	.046	.567	2.97	8.97**	2.36	.545	2.08	.163
	η^2	.129	.001	.009	.041	.112	.032	.008	.028	.002
Between	*F*	1.30	1.68	.280	.085	4.94*	3.32	.755	1.57	3.28
	η^2	.018	.023	.004	.001	.065	.044	.010	.045	.044
Interaction	*F*	5.08*	.662	1.02	.008	5.72*	.716	8.60**	3.36	.018
	η^2	.066	.009	.015	<.001	.075	.010	.107	.045	<.001

Note. N = 74 for all variables. Mean (*Standard Deviation*). IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. * denotes significance at the .05 level, *** denotes significance at the .001 level.

Table 7. 2x3 RANOVA on psychological measures, screened for intuitive eating

Group		IES	RES	EMOT	EXT	WBIS	BAS	MDDI	FCSelf	AAQ
Intervention	Pre	2.7 *(.22)*	3.2 *(.99)*	3.2 *(.94)*	3.2 *(.74)*	4.8 *(1.3)*	2.6 *(.62)*	29.8 *(8.8)*	26.3 *(15.5)*	34.1 *(11.9)*
	Post	2.8 *(.34)*	3.2 *(1.0)*	3.1 *(.98)*	3.3 *(.63)*	4.7 *(1.2)*	2.8 *(.62)*	32.6 *(9.7)*	31.3 *(15.8)*	32.7 *(11.2)*
	F/U	3.0 *(.47)*	2.9 *(1.1)*	3.1 *(.95)*	3.3 *(.72)*	4.6 *(1.2)*	3.0 *(.71)*	30.9 *(9.5)*	28.0 *(17.9)*	29.0 *(11.4)*
Control	Pre	2.8 *(.09)*	2.6 *(.76)*	3.1 *(.68)*	3.4 *(.43)*	4.6 *(1.5)*	3.1 *(1.1)*	30.8 *(10.7)*	23.6 *(14.3)*	28.2 *(13.8)*
	Post	3.0 *(.15)*	3.0 *(.87)*	3.1 *(.99)*	3.2 *(.60)*	4.0 *(1.4)*	3.3 *(.88)*	28.5 *(9.0)*	27.0 *(19.2)*	28.2 *(12.2)*
	F/U	3.1 *(.25)*	2.9 *(.84)*	3.0 *(.72)*	3.3 *(.44)*	4.0 *(1.6)*	3.0 *(.96)*	31.2 *(9.9)*	28.0 *(18.5)*	28.6 *(11.0)*
Within	*F*	11.92***	.1.62	.184	.092	2.61	1.47	.146	1.53	.806
	η^2	.386	.079	.010	.005	.122	.072	.008	.075	.041
Between	*F*	1.03	.305	.020	.010	.846	.919	.056	.115	.550
	η^2	.052	.016	.001	.001	.043	.046	.003	.006	.028
Interaction	*F*	.672	3.20	.027	1.16	.801	.927	2.13	.380	1.10
	η^2	.034	.144	.002	.061	.040	.046	.101	.020	.055

Note. N = 21 for all variables. Mean (*Standard Deviation*). IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. *** denotes significance at the .001 level.

differences between conditions across all three time points. There were no significant interactions between time and condition.

Hypothesis 3

To examine differences between men and women on study variables across the intervention, a 2x2 RANOVA was used with gender as an additional dependent variable. Specifically, scores on body image, intuitive eating, internalized weight bias, disordered eating, and self-compassion were compared between men and women from baseline to post-intervention. Results are displayed in Table 8. There were significant differences across time for external eating, muscle dysmorphia, and fear of self-compassion. Specifically, external eating decreased from baseline (M = 3.2, SD = .62) to post-intervention (M = 3.1, SD = .66), muscle dysmorphia increased from baseline (M = 24.8, SD = 7.6) to post-intervention (M = 25.6, SD = 7.8), and fear of self-compassion increased from baseline (M = 17.4, SD = 13.1) to post-intervention (M = 19.5, SD = 15.6). There were between-subjects differences for gender within self-compassion, intuitive eating, restrained eating, emotional eating, external eating, internalized weight bias, body appreciation, muscle dysmorphia, and psychological inflexibility. Men reported higher levels of self-compassion, intuitive eating, and body appreciation whereas women endorsed higher levels of restrained eating, emotional eating, externalized eating, internalized weight bias, muscle dysmorphia, and psychological inflexibility.

There were significant interactions between time and condition for internalized weight bias, muscle dysmorphia, and self-compassion. Additionally, there was an interaction between time and gender for muscle dysmorphia. For internalized weight bias, there were no main effects for time, $F(1, 300) = 1.12$, $p = .290$, $\eta^2 = 0.004$, or condition, $F(1) = 2.73$, $p = .099$, $\eta^2 = 0.009$. At post-intervention, the intervention group (M = 3.2) reported significantly higher internalized

weight bias compared to the control group (M = 2.8), F(1, 300) = 4.42, p = .036, η^2 = 0.015. Within the muscle dysmorphia interactions, there were main effects for time, F(1, 307) = 9.382, p = .002, η^2 = 0.030, and gender, F(1) = 4.22, p = .041, η^2 = 0.014, with muscle dysmorphia increasing between baseline (M = 24.3) and post-intervention (M = 25.2) and women (M = 25.7) endorsing higher muscle dysmorphia than men (M = 23.8). For the time by condition interaction, participants in the intervention group reported increased muscle dysmorphia between baseline (M = 24.2) and post-intervention (M = 26.0), F(1, 307) = 30.82, p < .001, η^2 = 0.091. For the time by gender interaction, men reported increased muscle dysmorphia between baseline (M = 22.9) and post-intervention (M = 24.7), F(1, 307) = 14.57, p < .001, η^2 = 0.045. Further, women (M = 25.8) reported higher levels of muscle dysmorphia than men (M = 22.9) at baseline, F(1) = 8.82, p = .003, η^2 = 0.028. Within the fear of self-compassion interaction, there were no main effects for time, F(1, 307) = 3.82, p = .051, η^2 = 0.012, or condition, F(1) = 3.63, p = .058, η^2 = 0.012. Participants in the intervention group reported a significant increase in fear of self-compassion between baseline (M = 17.5) and post-intervention (M = 21.2), F(1, 307) = 20.14, p < .001, η^2 = 0.062.

Next, a 2x3 RANOVA was conducted in order to examine gender differences between conditions across all three time points on study outcome variables. Results are presented in Table 9. There were significant differences across time for external eating and muscle dysmorphia. Specifically, external eating decreased between baseline (M = 3.1) and follow-up (M = 3.0, p = .005), and muscle dysmorphia increased between baseline (M = 23.8) and post-intervention (M = 25.2, p = .002) as well as follow-up (M = 25.4, p = .013). There were significant between-

Table 8. 2x2 RANOVA on key variables, examining differences by gender

		SCS	IES	RES	EMOT	EXT	WBIS	BAS	MDDI	FCSelf	AAQ
Time	*F*	1.67	2.55	1.37	1.76	11.32*	2.02	.022	11.02**	10.01**	.062
	η^2	.005	.008	.004	.006	.037	.007	<.001	.035	.032	<.001
Time* Condition	*F*	2.25	1.23	.414	1.69	.057	6.76*	1.88	14.52***	16.65***	.928
	η^2	.07	.004	.001	.006	<.001	.022	.006	.045	.051	.003
Time* Gender	*F*	.681	.278	.030	.090	.048	3.50	.258	10.87**	.009	.001
	η^2	.002	.001	<.001	<.001	<.001	.012	.001	.034	<.001	<.001
Time* Gender* Condition	*F*	.238	.007	.086	.822	.059	2.67	1.20	.104	1.98	.251
	η^2	.001	<.001	<.001	.003	<.001	.009	.004	<.001	.006	.001
Between Condition	*F*	1.80	.072	2.12	.270	.006	3.79	4.20*	1.09	6.20*	1.17
	η^2	.007	<.001	.007	.001	<.001	.012	.014	.004	.020	.004
Between Gender	*F*	24.25***	8.84**	10.31**	20.23***	16.23***	15.55***	17.80***	5.84*	.962	20.08***
	η^2	.085	.028	.033	.065	.052	.049	.055	.019	.003	.061
Between Condition * Gender	*F*	2.91	.708	.006	.874	.005	.185	.458	.587	1.37	.917
	η^2	.009	<.001	<.001	.003	<.001	.001	.001	.002	.004	.003

Note. Mean (*Standard Deviation*). SCS = Self-Compassion Scale, IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. * denotes significance at the .05 level, ** denotes significance at the .01 level, *** denotes significance at the .001 level.

subjects differences between gender for external eating, such that women (M = 3.2) reported high levels of external eating than men (M = 2.9, p = .048).

There was significant interaction between time and gender for self-compassion, intuitive eating, internalized weight bias, body appreciation, and muscle dysmorphia. There was also an interaction between time and condition for muscle dysmorphia. For self-compassion, there were no significant main effects for time, $F(2, 93) = .719$, $p = .490$, $\eta^2 = 0.015$, or gender, $F(1) = .837$, $p = .363$, $\eta^2 = 0.009$. Among women, self-compassion increased between baseline (M = 2.9) and follow-up (M = 3.1, p = .005), $F(2, 93) = 4.05$, $p = .021$, $\eta^2 = 0.080$. For intuitive eating, there was a main effect for time, $F(2, 93) = 3.16$, $p = .047$, $\eta^2 = 0.064$. Intuitive eating was significantly lower at baseline (M = 3.51) compared to post-intervention (M = 3.60, p = .016). Simple effects existed for the control condition, such that intuitive eating increased between baseline (M = 3.5) and post-intervention (M = 3.6, p = .026), although the omnibus was not statistically significant, $F(2, 93) = 2.58$, $p = .081$, $\eta^2 = 0.053$. Within internalized weight bias, there were no significant main effects for time, $F(2, 88) = .089$, $p = .915$, $\eta^2 = 0.002$, or gender, $F(1) = .043$, $p = .837$, $\eta^2 = 0.000$. However, women reported lower levels of internalized weight bias at follow-up (M = 3.0) compared to baseline (M = 3.3, p = .011) and post-intervention (M = 3.2, p = .018), $F(2, 88) = 3.84$, $p = .025$, $\eta^2 = 0.080$. In contrast, men reported higher levels of internalized weight bias at follow-up (M = 3.3) compared to baseline (M = 3.0, p = .046), although the omnibus was not statistically significant, $F(2, 88) = 2.09$, $p = .130$, $\eta^2 = 0.045$. For body appreciation, there were no significant main effects for time, $F(2, 93) = 1.94$, $p = .149$, $\eta^2 = 0.040$, or gender, $F(1) = .293$, $p = .590$, $\eta^2 = 0.003$. There was a simple effect for men, however, such that body appreciation at follow-up (M = 3.5) was significantly lower than baseline (M = 3.8, p = .014) and post-intervention (M = 3.8, p = .010), $F(2, 93) = 3.70$, $p = .029$, $\eta^2 = 0.074$.

Finally, within muscle dysmorphia, there was a main effect for time, $F(2, 93) = 5.32$, $p = .006$, $\eta^2 = 0.103$, with muscle dysmorphia scores significantly lower at baseline ($M = 23.8$) than post-intervention ($M = 25.2$, $p = .002$) and follow-up ($M = 25.4$, $p = .013$). For the time by condition interaction, there was a simple effect within the intervention group, such that baseline scores ($M = 23.8$) were significantly lower than post-intervention ($M = 26.6$, $p < .001$) and follow-up ($M = 25.5$, $p = .043$), $F(2, 93) = 11.85$, $p < .001$, $\eta^2 = 0.203$. For the time by gender interaction, the scores for men increased between baseline ($M = 22.5$), post-intervention ($M = 24.7$, $p = .004$), and follow-up ($M = 26.2$, $p = .001$), $F(2, 93) = 6.68$, $p = .002$, $\eta^2 = 0.126$.

Hypothesis 4

Hypothesis four proposed that self-compassion and psychological (in)flexibility would mediate the degree of change in outcome variables across the study. Direct and indirect effects were proposed to be explored using the parallel multiple mediator model (Hayes, 2018). Mediation assumes that a predictor variable (i.e., condition) affects an outcome variable of interest (e.g., intuitive eating) in order to examine whether a mediator (e.g., psychological flexibility) accounts for this relationship in addition to or in place of the predictor. However, in the current study, the intervention did not produce a change in self-compassion nor psychological flexibility as noted in the sections above. Although these proposed mediators were predicted to change in relation to treatment engagement, the lack of variation in these variables across time reduce the probability of accounting for changes in other outcome variables. As such, mediation within the current study was not conducted as it would violate statistical assumptions required to examine this hypothesis.

Table 9. 2x3 RANOVA on key variables, examining differences by gender

		SCS	IES	RES	EMOT	EXT	WBIS	BAS	MDDI	FCSelf	AAQ
Time	*F*	.693	2.36	1.35	1.75	4.73*	.107	2.44	5.11*	1.16	.665
	η^2	.007	.024	.014	.019	.052	.001	.025	.052	.012	.007
Time* Condition	*F*	.888	.476	.115	.004	.822	2.32	.542	4.09*	2.00	1.00
	η^2	.009	.005	.001	<.001	.009	.025	.006	.045	.021	.011
Time*Gender	*F*	3.36*	4.74*	.209	.208	.077	6.57**	5.42**	7.49**	.219	2.54
	η^2	.035	.048	.002	.002	.001	.069	.055	.074	.002	.026
Time*Gender*Condition	*F*	.051	.286	.421	.446	.075	2.56	.420	.399	.485	.595
	η^2	.001	.003	.005	.005	.001	.028	.004	.004	.005	.006
Between Condition	*F*	.136	.081	.023	.286	.023	.032	.380	.281	1.35	.345
	η^2	.001	.001	<.001	.003	<.001	<.001	.004	.003	.014	.009
Between Gender	*F*	.837	.054	.274	.781	4.01*	.043	.293	.178	.018	2.40
	η^2	.009	.001	.003	.009	.044	<.001	.003	.002	<.001	.025
Between Condition* Gender	*F*	1.39	.127	.018	.148	.099	1.11	.237	.723	.138	.375
	η^2	.015	.001	<.001	.002	.001	.012	.003	.008	.001	.004

Note. Mean (*Standard Deviation*). SCS = Self-Compassion Scale, IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. * denotes significance at the .05 level, ** denotes significance at the .01 level.

Hypothesis 5

To test the hypothesis that fear of self-compassion moderates the relationship between self-compassion and outcome variables, regression analyses were conducted using PROCESS, version 3.5, model 1 (Hayes, 2004). Initially, two variables were included in the model, self-compassion and fear of self-compassion. Then an interaction term between fear of self-compassion (e.g., moderator) and self-compassion (e.g., predictor) was added to the regression model. This method was employed for outcome variables of interest and across all three time points using self-compassion and fear of self-compassion from each corresponding time point. Treatment condition was included as a covariate to further extrapolate differences between groups. The following results did not differ when analyses were conducted without treatment group as a covariate. Results are presented in Table 10.

Intuitive Eating

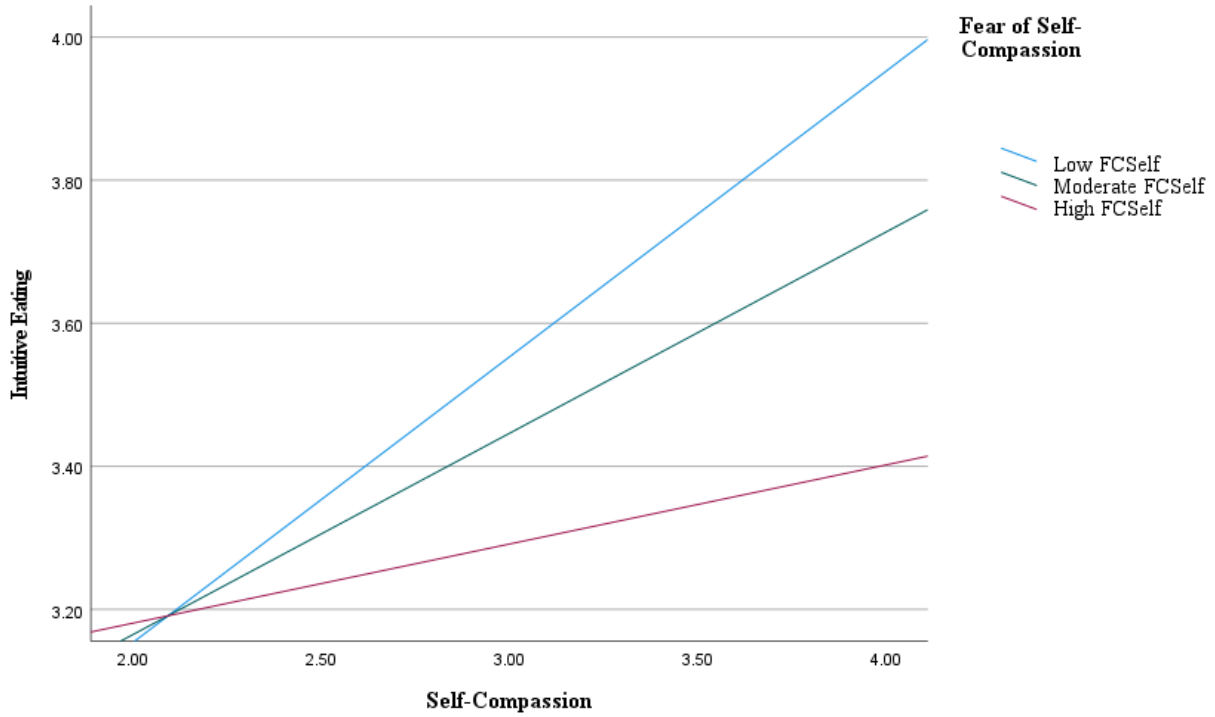
The regression equation for intuitive eating was significant at baseline, $F(4, 94) = 9.86$, $p < .0001$, $R^2 = .30$, post-intervention, $F(4, 94) = 10.28$, $p < .0001$, $R^2 = .30$, and follow-up, $F(4, 94) = 10.50$, $p = .0001$, $R^2 = .31$. There were main effects for self-compassion on intuitive eating at all three time points. The interaction term between self-compassion and fear of self-compassion was significant at baseline, $F(1, 94) = 4.24$, $p = .042$, R^2 change = .03, and follow-up, $F(1, 94) = 4.20$, $p = .043$, R^2 change = .03. See Figure 7 for visual representation of interaction. Examination of the simple slopes at baseline showed that there was a significant effect for moderate levels of fear of self-compassion (effect = .21, $p = .01$) as well as for low levels of fear of self-compassion (effect = .31, $p = .001$), such that as fear of self-compassion increased, the effect of self-compassion on intuitive eating decreased. Examination of the simple slopes at follow-up showed that there was a significant effect for moderate levels of fear of self-

Table 10. Fear of self-compassion as a moderator between self-compassion and outcome variables across all time points

Intuitive Eating									
	Baseline			**Post**			**Follow-Up**		
Variables	***B***	***SE***	***p***	***B***	***SE***	***p***	***B***	***SE***	***p***
Self-Compassion	.329	.101	.001**	.380	.099	<.001***	.396	.094	<.001***
Fear of Self-Compassion	.013	.012	.261	.013	.010	.217	.015	.010	.141
Self-Compassion x Fear of Self-Compassion	-.009	.004	.042*	-.007	.004	.050	-.007	.003	.043*
Condition	-.017	.095	.858	-.035	.098	.722	.060	.093	.522
Restrained Eating									
	Baseline			**Post**			**Follow-Up**		
Variables	***B***	***SE***	***P***	***B***	***SE***	***P***	***B***	***SE***	***p***
Self-Compassion	-.185	.173	.288	-.126	.179	.482	-.073	.182	.687
Fear of Self-Compassion	-.005	.019	.794	.029	.019	.136	.033	.019	.094
Self-Compassion x Fear of Self-Compassion	.013	.007	.079	-.002	.007	.785	-.004	.007	.539
Condition	.016	.163	.098	.144	.177	.419	.042	.181	.816
Emotional Eating									
	Baseline			**Post**			**Follow-Up**		
Variables	***B***	***SE***	***p***	***B***	***SE***	***p***	***B***	***SE***	***p***
Self-Compassion	-.564	.182	.002**	-.628	.188	.001**	-.629	.180	<.001***
Fear of Self-Compassion	-.012	.021	.566	-.016	.020	.438	-.034	.020	.086
Self-Compassion x Fear of Self-Compassion	.007	.007	.376	.007	.007	.309	.016	.007	.002**
Condition	-.087	.172	.614	.010	.187	.957	-.045	.181	.803
External Eating									
	Baseline			**Post**			**Follow-Up**		
Variables	***B***	***SE***	***p***	***B***	***SE***	***p***	***B***	***SE***	***p***
Self-Compassion	-.424	.138	.002**	-.407	.136	.003**	-.246	.156	.117
Fear of Self-Compassion	-.024	.016	.136	-.024	.015	.104	.000	.017	.954
Self-Compassion x Fear of Self-Compassion	.009	.006	.115	.008	.005	.147	.000	.006	.878
Condition	.039	.129	.765	-.066	.136	.631	-.052	.154	.732

Internalized Weight Bias									
	Baseline			Post			Follow-Up		
Variables	***B***	***SE***	***p***	***B***	***SE***	***p***	***B***	***SE***	***p***
Self-Compassion	-1.22	.249	<.0001***	-.835	.231	<.001***	-.831	.252	.001**
Fear of Self-Compassion	.004	.029	.899	.050	.025	.047*	.020	.027	.457
Self-Compassion x Fear of Self-Compassion	.009	.011	.365	-.008	.009	.370	.001	.009	.867
Condition	.205	.235	.385	.079	.233	.733	.008	.253	.975
Body Appreciation									
	Baseline			Post			Follow-Up		
Variables	***B***	***SE***	***p***	***B***	***SE***	***p***	***B***	***SE***	***P***
Self-Compassion	.613	.165	<.001***	.614	.146	<.001***	.596	.152	<.001***
Fear of Self-Compassion	-.021	.019	.276	-.015	.016	.337	-.001	.016	.948
Self-Compassion x Fear of Self-Compassion	.002	.007	.797	.000	.006	.950	-.005	.006	.348
Condition	.044	.155	.775	.009	.145	.953	-.006	.152	.968
Muscle Dysmorphia									
	Baseline			Post			Follow-Up		
Variables	***B***	***SE***	***p***	***B***	***SE***	***p***	***B***	***SE***	***p***
Self-Compassion	-3.04	1.41	.033*	-2.23	1.46	.130	-.576	1.59	.717
Fear of Self-Compassion	.141	.162	.382	.326	.156	.039*	.246	.172	.156
Self-Compassion x Fear of Self-Compassion	-.004	.059	.948	-.074	.055	.186	-.015	.059	.794
Condition	.120	1.32	.927	-1.92	1.45	.189	.089	1.59	.955
Psychological Inflexibility									
	Baseline			Post			Follow-Up		
Variables	***B***	***SE***	***p***	***B***	***SE***	***p***	***B***	***SE***	***p***
Self-Compassion	-7.07	1.56	<.0001***	-5.96	1.35	<.0001***	-4.22	1.36	.002**
Fear of Self-Compassion	.387	.179	.033*	.374	.144	.011*	.444	1.47	.003**
Self-Compassion x Fear of Self-Compassion	-.029	.066	.663	-.039	.051	.451	-.035	.050	.489
Condition	-1.69	1.47	.252	-.619	1.34	.645	.000	1.36	.999

Figure 7. Moderation of fear of self-compassion between self-compassion and intuitive eating at baseline



Note. Interaction for changes at follow-up is similar to baseline interaction. FCSelf = Fear of Self-Compassion.

compassion (effect = .28, $p < .001$) as well as for low levels of fear of self-compassion (effect = .39, $p < .0001$), such that as fear of self-compassion increased, the effect of self-compassion on intuitive eating decreased. For participants with high levels of fear of self-compassion, there is no relationship between self-compassion on intuitive eating (effect = .11, $p = .29$). The interaction was trending for significance at post-intervention, $F(1, 94) = 3.92$, $p = .05$, R^2 change = .03.

Restrained Eating

The model for restrained eating was significant at baseline, $F(4, 94) = 7.44$, $p < .0001$, $R^2 = .24$, post-intervention, $F(4, 94) = 7.69$, $p < .0001$, $R^2 = .25$, and follow-up, $F(4, 93) = 6.49$, $p = .0001$, $R^2 = .22$. The interaction equation was not significant at baseline, $F(1, 94) = 3.13$, $p =$

.079, R^2 change = .03, post-intervention, $F(1, 3) = 0.07$, $p = .785$, R^2 change = .00, or follow-up, $F(1, 93) = 0.38$, $p = .539$, R^2 change = .00.

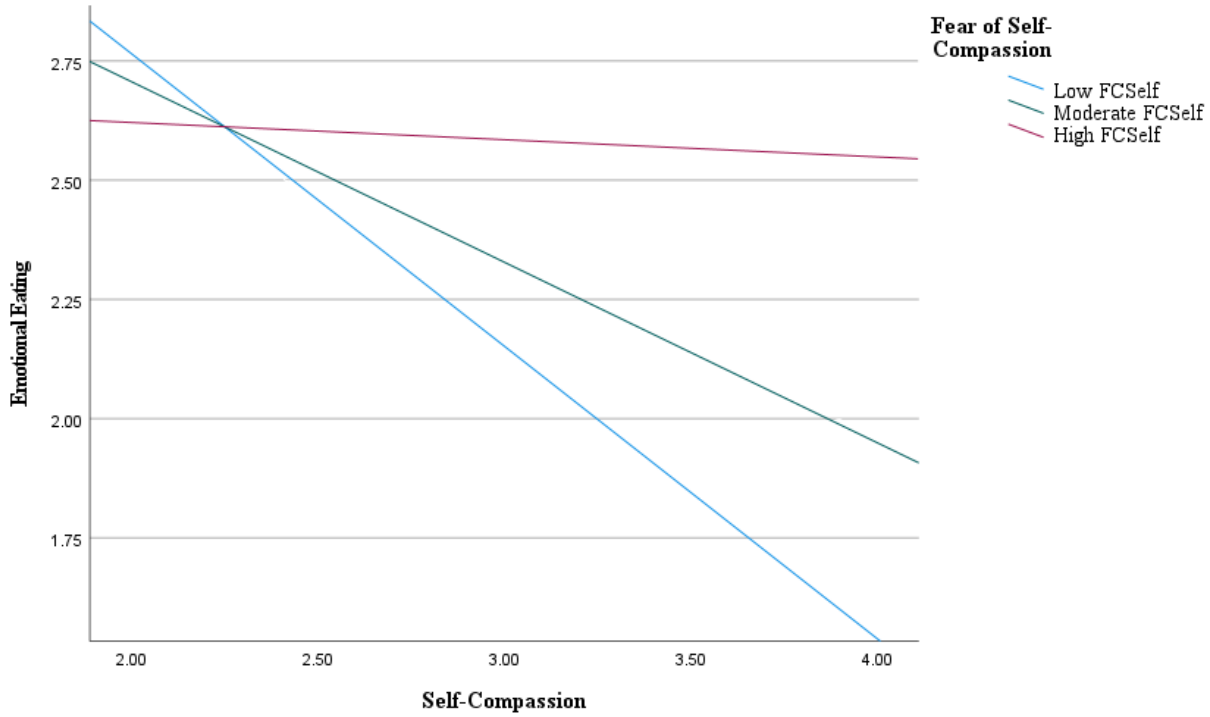
Emotional Eating

The model for emotional eating was significant at baseline, $F(4, 93) = 6.74$, $p = .0001$, $R^2 = .22$, post-intervention, $F(4, 92) = 6.39$, $p = .0001$, $R^2 = .22$, and follow-up, $F(4, 93) = 7.24$, $p = .0001$, $R^2 = .24$. There were main effects for self-compassion on intuitive eating across all three time points. The interaction equation was significant at follow-up, $F(1, 93) = 5.69$, $p = .019$, R^2 change = .05. See Figure 8 for visual representation of interaction. Examination of the simple slopes indicated that there was a significant effect for moderate levels of fear of self-compassion (effect = -.38, $p = .01$) as well as for low levels of fear of self-compassion (effect = -.61, $p < .001$), such that as fear of self-compassion increases, the effect of self-compassion on reducing emotional eating behaviors decreases. At high levels of fear of self-compassion, there is no significant relationship between self-compassion and emotional eating (effect = -.03, $p = .89$). The interactions were not significant at baseline, $F(1, 93) = 0.79$, $p = .376$, R^2 change = .00, or post-intervention, $F(1, 92) = 1.04$, $p = .309$, R^2 change = .01.

External Eating

For external eating, the regression equation was significant at baseline, $F(4, 93) = 3.84$, $p = .006$, $R^2 = .14$, and post-intervention, $F(4, 90) = 2.89$, $p = .026$, $R^2 = .11$. There were significant main effects of self-compassion on external eating at baseline and post-intervention. The overall model was not significant at follow-up, $F(4, 92) = 1.84$, $p = .128$, $R^2 = .07$. The interaction models were not significant for external eating at baseline, $F(1, 93) = 2.52$, $p = .115$, R^2 change = .02, post-intervention, $F(1, 90) = 2.13$, $p = .147$, R^2 change = .02, or follow-up, $F(1, 92) = 0.02$, $p = .878$, R^2 change = .00.

Figure 8. Moderation of fear of self-compassion between self-compassion and emotional eating at follow-up



Note. FCSelf = Fear of Self-Compassion.

Internalized Weight Bias

The model for internalized weight bias was significant at baseline, $F(4, 92) = 25.94$, $p < .0001$, $R^2 = .53$, post-intervention, $F(4, 92) = 25.86$, $p < .0001$, $R^2 = .53$, and follow-up, $F(4, 93) = 15.35$, $p < .0001$, $R^2 = .40$. There were significant main effects for self-compassion on internalized weight bias across all three time points. There was a significant main effect for fear of self-compassion on internalized weight bias at post-intervention. The interaction was not significant interaction for internalized weight bias at baseline, $F(1, 92) = 0.83$, $p = .365$, R^2 change = .00, post-intervention, $F(1, 92) = 0.81$, $p = .370$, R^2 change = .00, or follow-up, $F(1, 93) = 0.03$, $p = .867$, R^2 change = .00.

Body Appreciation

The model for body appreciation was significant at baseline, $F(4, 94) = 20.07$, $p < .0001$, $R^2 = .46$, post-intervention, $F(4, 94) = 23.98$, $p < .0001$, $R^2 = .51$, and follow-up, $F(4, 94) = 17.14$, $p < .0001$, $R^2 = .42$. There were main effects for self-compassion on body appreciation across all three time points. The interaction equation for was not significant at baseline, $F(1, 94) = 0.07$, $p = .797$, R^2 change = .00, post-intervention, $F(1, 94) = 0.00$, $p = .950$, R^2 change = .00, or follow-up, $F(1, 94) = 0.89$, $p = .348$, R^2 change = .01.

Muscle Dysmorphia

The model for muscle dysmorphia was significant at baseline, $F(4, 94) = 9.35$, $p < .0001$, $R^2 = .28$, post-intervention, $F(4, 94) = 11.56$, $p < .0001$, $R^2 = .33$, and follow-up, $F(3, 94) = 6.44$, $p = .0001$, $R^2 = .22$. There was a significant main effect of self-compassion on muscle dysmorphia at baseline and a significant main effect of fear of self-compassion on muscle dysmorphia at post-intervention. None of the interaction equations were significant for muscle dysmorphia: baseline, $F(1, 94) = 0.00$, $p = .948$, R^2 change = .00; post-intervention, $F(1, 94) = 1.77$, $p = .186$, R^2 change = .01; follow-up, $F(1, 94) = 0.07$, $p = .794$, R^2 change = .00.

Psychological Inflexibility

The model for psychological flexibility was significant at baseline, $F(4, 94) = 45.13$, $p < .0001$, $R^2 = .66$, post-intervention, $F(4, 94) = 47.18$, $p < .0001$, $R^2 = .67$, and follow-up, $F(4, 94) = 44.98$, $p < .0001$, $R^2 = .65$. There were significant main effects for self-compassion and fear of self-compassion on psychological inflexibility at all three time points. The interactions were not significant at baseline, $F(1, 94) = 0.19$, $p = .663$, R^2 change = .00; post-intervention, $F(1, 94) = 0.57$, $p = .451$, R^2 change = .00; follow-up, $F(1, 94) = 0.49$, $p = .484$, R^2 change = .00.

Influence of Practice on Outcomes

Participants reported their level of engagement and practice using skills provided during the intervention at the final assessment period. Practice was initially examined as a continuous variable corresponding to how frequently participants used aspects of the intervention of the previous week, ranging from no days (0) to all days (7). However, analyses were ran with practice operationalized as a as a categorical variable (e.g., no days [n = 27], one-to-three days of practice [n = 68], and four days or more of practice [n = 12]) in order to more efficiently examine mean differences across time. A 2X3 RANOVA was used to examine the effects of practice at all three levels previously described across at post-intervention and follow-up among the treatment group only (see Table 12). Baseline scores were not included due to practice not occurring until following the intervention (i.e., between post-intervention and follow-up). Of note, there were no statistical differences in outcomes based on how practice was operationalized. There were within-subjects differences for self-compassion, internalized weight bias, muscle dysmorphia, fear of self-compassion, and psychological inflexibility, with increased levels of self-compassion and decreased levels of dysfunction across time (i.e., reduced internalized weight bias, etc.). There were between-subjects effects for practice on self-compassion, restrained eating, internalized weight bias, muscle dysmorphia, and fear of self-compassion. Post-hoc analyses using Fisher's Least Significant Difference (LSD) indicated that for self-compassion 1-3 days of practice produced a mean difference of .60 (*SD* = .21) lower than 0 days of practice (p = .007), 1-3 days of practice for restrained eating produced a mean difference of .79 (*SD* = .29) higher than 0 days of practice (p = .008), internalized weight bias produced a mean difference of 1.28 (*SD* = .44) higher for 1-3 days of practice than 0 days of practice (p = .005), muscle dysmorphia scores produced a mean difference of 6.0 (*SD* = 2.2)

higher for 1-3 days of practice than 0 days of practice (p = .009), and 1-3 days of practice produced a mean difference of 14.8 (SD = 4.6) higher than 0 days of practice for fear of self-compassion (p = .002). There were no significant interaction effects for practice on all study variables. There were no significant interaction effects between time and practice.

Table 11. 2x3 RANOVA examining practice across time on key variables

		Practice	SCS	IES	RES	EMOT	EXT	WBIS	BAS	MDDI	FCSelf	AAQ
	Post	None	3.4 *(.92)*	3.8 *(.56)*	1.9 (*.80*)	1.8 (*.69*)	2.8 (*.72*)	2.6 *(1.4)*	3.9 *(.85)*	23.1 *(6.6)*	13.5 *(13.1)*	19.3 *(9.6)*
		1-3 days	2.8 *(.66)*	3.4 *(.52)*	2.8 (*1.1*)	2.5 *(.96)*	3.3 (*.61*)	3.8 (*1.7*)	3.3 *(.93)*	29.2 *(8.7)*	27.8 *(16.4)*	26.7 *(10.6)*
		≥4 days	3.2 *(.65)*	3.4 *(.52)*	2.5 *(.66)*	2.4 *(1.2)*	2.9 *(.65)*	3.3 *(1.6)*	3.7 *(1.0)*	28.2 *(7.6)*	16.0 *(13.0)*	22.3 *(12.5)*
	F/U	None	3.5 *(.88)*	3.7 *(.57)*	1.9 (*.75*)	1.7 (*.64*)	2.8 (*.69*)	2.3 *(1.2)*	3.8 *(.90)*	21.6 *(4.9)*	11.2 *(14.3)*	15.6 *(6.5)*
		1-3 days	2.8 *(.70)*	3.4 *(.50)*	2.7 *(1.1)*	2.4 *(1.0)*	3.2 *(.78)*	3.7 *(1.4)*	3.3 *(.81)*	27.6 *(8.4)*	26.5 *(17.7)*	25.8 *(10.7)*
		≥4 days	3.5 *(.82)*	3.6 *(.73)*	2.5 *(.88)*	2.2 *(1.2)*	2.8 *(.80)*	3.0 *(2.0)*	3.7 *(1.1)*	25.3 *(7.0)*	12.2 *(13.5)*	18.3 *(11.1)*
Within	*F*		5.32*	.061	.181	2.44	2.01	5.86*	.001	7.88**	4.64*	8.50**
	η^2		.084	.001	.003	.042	.035	.095	.000	.120	.074	.128
Between	*F*		4.44*	2.89	3.77*	2.8	3.00	4.25*	2.82	3.63*	6.01**	1.75
Practice	η^2		.133	.091	.117	.092	.097	.132	.089	.111	.172	.057
Interaction	*F*		1.33	.908	.329	.167	.057	1.36	.172	.341	.370	1.75
X Practice	η^2		.044	.030	.011	.006	.002	.046	.006	.012	.013	.057

Note. Mean (*Standard Deviation*). SCS = Self-Compassion Scale, IES = Intuitive Eating Scale – 2, RES = DEBQ Restrained Eating Subscales, EMOT = DEBQ Emotional Eating Subscale, EXT = DEBQ External Eating Subscale, WBIS = Weight Bias Internalization Scale – Modified, BAS = Body Appreciation Scale, MDDI = Muscle Dysmorphic Disorder Inventory, FCSelf = Fear of Self-Compassion Scale, AAQ = Acceptance and Action Questionnaire-II. * denotes significance at the .05 level, ** denotes significance at the .01 level.

Discussion

The purpose of the current study was to examine the impact of a brief online self-compassion intervention designed to improve adaptive eating behaviors and body image among undergraduate men and women as well as to explore mechanisms of change (e.g., psychological flexibility). Despite a growing body of literature supporting the efficacy of compassion-focused and acceptance-based interventions for body image and eating behavior (Adams & Leary, 2007; Albertson et al., 2015; Butryn et al., 2013; Hill et al., 2014; Kelly & Carter, 2015; Webb & Hardin, 2016), researchers have called for more studies to strengthen these findings (Rahimi-Ardabili et al., 2018). Additionally, there are currently no studies examining intuitive eating outcomes and underlying mechanisms for these interventions.

Consistent with prior research (Breines et al., 2014; Daye et al., 2014; Duarte et al., 2015; Ferreira et al., 2013; Ferreira et al., 2014; Gale et al., 2014; Homan & Tylka, 2015; Mosewich et al., 2011; Pinto-Gouveia et al., 2014; Pisitsungkagarn et al., 2013; Przezdziecki et al., 2013; Stapleton & Nikalje, 2013; Taylor et al., 2015; Tylka et al., 2015; Webb & Forman, 2013), self-compassion was significantly related to all outcome variables of interest. Specifically, research has shown that higher levels of self-compassion are negatively related to pressure to be thin and thin-ideal internalization (Tylka et al., 2015) as well as lower levels of shame and eating pathology (Kelly et al., 2012). Additionally, self-compassion has been shown to positively relate to body image flexibility and to predict greater acceptance of internal events and subsequently intuitive eating (Schoenefeld & Webb, 2013). Moreover, self-compassion has been proposed as a protective factor to prevent the onset and persistence of body image concerns and disordered eating (Tylka & Kroon Van Diest, 2015; Braun et al., 2016). These findings have prompted

researchers to explore the causal relationship between self-compassion and health behaviors through a variety of interventions.

In this investigation, the brief online self-compassion intervention failed to create statistically significant differences in proposed study outcomes. There were no meaningful changes detected in the intervention condition in self-compassion, intuitive eating, disordered eating, internalized weight bias, body appreciation, muscle dysmorphia, or psychological inflexibility post-intervention or at follow-up. Within the control group, however, there was a significant decrease in internalized weight bias across time. These findings come in stark contrast with the literature showing the effectiveness of short-term self-compassion interventions. For example, a randomized control trial comparing self-compassion and behavioral strategy self-help conditions to a control condition among a clinical population with binge eating disorder in an in-person setting across 3-weeks found that the self-compassion condition demonstrated significantly greater decreases in eating disorder pathology, weight concerns, and eating concerns compared to the behavioral strategies and control conditions (Kelly & Carter, 2015). Further, a three-week self-compassion intervention comprised of 20-minute daily self-guided self-compassion meditation demonstrated significantly greater improvements in self-compassion ($d = .82$) and body appreciation ($d = .62$) as well as reductions in body dissatisfaction ($d = .73$), body shame ($d = .68$), and contingent self-worth on appearance ($d = .45$) compared to a waitlist control (Anderson et al., 2015). Related to internet-based interventions, a 10-week self-guided online self-compassion program demonstrated significant increases in self-compassion and decreases in self-judgment, perfectionism, and shame relative compared to a control as well as across time (Nadeau et al., 2020). Further, a systematic review on self-compassion-related interventions for obesity and weight-related psychological conditions suggested self-compassion

interventions may reduce the barriers that interfere with healthy weight management by addressing self-critical thoughts, decreasing stress, and increasing acceptance of emotionally charged self-statements (Rahimi-Ardabili et al., 2018). There are a number of factors that may have influenced the outcomes of the current study that are inconsistent with the existing body of literature.

First, the delivery of the intervention may have interfered with the mechanisms that support and encourage changes in self-compassion, adaptive eating behaviors, and body image. The current study was originally proposed to be delivered through an in-person format in order to maximize engagement with study participants. Numerous third-wave cognitive behavioral therapies are comprised of experiential exercises to encourage client and patient learning through direct application of intervention material, and self-compassion programs are primarily experiential in nature (Germer & Neff, 2013). The original study intervention was founded on experiential learning theory which posits that knowledge is created from the combination of grasping and transforming experience through interactive transactions between the person and their environment (Kolb, 1984). Additionally, many of these exercises are subsequently processed to deepen and reinforce the experience and learning that occurred, often in a group (Neff & Germer, 2013). Due to restrictions associated with the COVID-19 pandemic, this study transitioned to a self-paced intervention delivered in the online platform, Qualtrics (Qualtrics, 2021). Although videos of exercises were ideal, the Qualtrics platform at the time of study launch was not equipped to upload videos for the intervention. Therefore, the intervention was delivered through print or written information, visual images, and embedded audio files. This modality potentially severely limited experiential engagement in intervention materials.

Three groups of participants (n = 17) were run through the in-person self-compassion intervention originally approved in the study proposal prior to the shutdown of on-campus activities due to the COVID-19 pandemic. Participant engagement was rated high by study staff (M = 7.3 on scale from 1 [no engagement/participation] to 10 [complete participation/fully engaged]), albeit anecdotal. Although the data from the in-person intervention were insufficient for analysis and it is not possible to examine the level of engagement and participation during the online delivery of the intervention, the location of participants at the time of completing the intervention is likely a confounding variable for the present study. At the outset of the intervention, participants were informed and requested to complete the survey in a quiet, comfortable location for maximum engagement and participation. However, this may not have been attainable by all participants, and it is unknown what environment or setting in which participants were completing the study. Specifically, all on-campus activities were halted due to COVID-related safety concerns, and students were displaced from campus to distant locations for the entirety of the school year. Not all educational environments are created equally, and location plays a vital role in students' ability to attend to and retain information.

Research on learning spaces has indicated that the quality of the learning environment is a significant determinant of an individual's ability to learn (Dorman, 2001). Social and academic engagement of students and the environment in which they are located can influence success and completion within a campus environment (Tinto, 1987). While participation in this study is not graded or considered an academic assignment, the content of the intervention required attention and focus in order to understand and integrate new knowledge that can be applied to oneself. A mixed-methods study examining college students' experiences during the COVID-19 pandemic found that students experienced a significant decline in self-reported learning from before to

during the pandemic (Hagedorn et al., 2021). Since the onset of the pandemic, 72.5% of students reported less than ideal learning (e.g., 35.5% as fair, 24.4% as poor, and 12.6% as very poor). The home environment was attributed for one of the many challenges to distance learning. Specifically, students reported lack of dedicated office space, family distractions, minimal control over their environment, and interactions with parents (e.g., pressure to be productive, new rules, new expectations, etc.). Furthermore, some students prefer to go away to college to escape unhealthy home environments, including lack of autonomy, increased stress, domestic violence or abuse, and limited resources. In fact, a 2019 epidemiological study reported that 44% of college students reported experiencing emotional abuse, 16% reported physical abuse, and 11% reported sexual abuse prior to attending university (Merians et al., 2019).

In cases such as domestic violence or inter-parental abuse, educational settings are considered a source of continuity and security (Lloyd, 2018). Living in a home environment, currently or historically, has been shown to correspond to physical and psychological barriers to learning, disrupting their schooling and adversely affecting educational outcomes (Lloyd, 2018). These pre-existing stressful environments may have been exacerbated by the pandemic, with domestic violence responses rising from 10% to 27% in the US between March 2019 and March 2020 (Boserup et al., 2020). This is particularly alarming given that approximately 50% of full-time students relocated to their parents' house following campus-closures in a study of an urban university (Lopez-Castro et al., 2020). Within such challenging environments, it may be particularly challenging to be present and compassionate with oneself. This is particularly relevant given the strong relationship between shame and abuse (Negrau et al., 2005) as well as shame and self-compassion (Gilbert, 2009; 2010). It is true, however, that not all experiential learning requires in-person interactions to occur.

The global context during the time period in which the study was conducted may have played a significant role on study outcomes and requires further discussion. In March 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic amidst the rapid spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2; WHO, 2020). The disease was determined to be transmitted from both symptomatic and asymptomatic individuals, with the most severe cases contributing to pneumonia, acute respiratory syndrome, and kidney failure (Ren et al., 2020). Authorities enacted state and nation-wide lockdowns commonly referred to as "quarantines" that led to mandatory closures of schools, universities, churches, recreational spaces, and all public locations and businesses deemed nonessential. There is an abundance of research demonstrating the deleterious effects of the pandemic on mental health and well-being despite only being one year removed from this experience. Social isolation, fear of infection, long periods of lockdown, difficulty accessing medical care and medications, lack of necessary supplies, and stigma have been highlighted as factors contributing to the onset and exacerbation of adverse psychological outcomes (Loades et al., 2020; Hawryluck et al., 2004; Reynolds et al., 2008; Marjanovic et al., 2007). Individuals in quarantine have experienced a heightened risk of developing depression and anxiety disorders as well as experiencing elevated stress, irritability, fear, frustration, boredom, confusion, anger, and symptoms of post-traumatic stress disorder (PTSD) and insomnia (Brooks et al., 2020; Hossain et al., 2020; Loades et al., 2020). More specific to students, Cao and colleagues (2020) identified a positive and moderate correlation between concerns regarding academic delays and academic performance and levels of anxiety. A study from an urban university within three months of the pandemic onset found that close to 90% of students met the cutoff score for depression (PHQ-9 >10) in the past two weeks, and 65% of students reported severe symptoms of anxiety (GAD-7 > 14; Lopez-Castro et

al., 2020). Moreover, research has suggested that contextual stressors outside the family (i.e., global pandemic) are especially distressing because of the lack of control to make changes (Boss, 2001).

This global backdrop is important when considering the lack of significant findings in the present study. The context of the pandemic may have interfered with overall engagement in the study. There were substantial competing priorities during quarantine and nation-wide restrictions that may have prevented investment into the intervention. Research into challenges for students during the pandemic highlight longer lectures online than the class time, managing numerous technology platforms, modified due dates for assignments, abundant emails from professors and instructors, caring for the physical health of family, increased work or searching for work, and becoming sick with COVID themselves (Hagedorn et al., 2020; Hall & Zygmunt, 2021). These numerous challenges affecting various life domains are likely to take precedence over a nonessential, ungraded, and voluntary workshop. Banks and Boals (2017) produced empirical support for the concept of mind wandering which has been shown to mediate the primary pathway between stress and anxiety and cognitive functioning. Mind wandering refers to thoughts about personal goals or tasks that are unrelated to the current task. These same authors stated that the COVID-19 pandemic provided a context for endless mind wandering as a major deterrent to staying focused on work (Boals & Banks, 2020). They highlighted that cognitive impairments while working or studying from home during the pandemic are inevitable, even for the more resilient individuals. Moreover, mind wandering has been associated with worse academic performance (Wammes et al., 2016) and poorer performance on everyday tasks (McVay et al., 2009). Mindful awareness, a core component of self-compassion to identify

personal suffering and extend compassion to oneself (Neff, 2003b), may be considerably difficult within a context comprised of substantial suffering, ambiguity, and restriction.

Furthermore, there is an abundance of literature highlighting the effects of stress on learning and memory abilities (Joels et al., 2006; Lupien & Lepage, 2001; Sandi, 2013; Scholey et al., 2014). Stress affects the body through two biological systems: the autonomic nervous system (ANS) and the hypothalamic-pituitary-adrenal (HPA) axis (Joels et al., 2006). The ANS and HPA axis have direct effects on the neural circuits in the brain responsible for data processing and learning (Sandi, 2013). Among other factors, the degree to which these systems are activated is determined by the severity of the stressor(s). Specifically, the effects on learning depend on the intensity, duration, origin, and magnitude of the stressors (Sandi, 2013). Although mild stress may support improved cognitive functioning, stress that exceeds the threshold of intensity causes impairments in cognitive processing, learning, and memory (Yaribeygi et al., 2017). The unprecedented nature of the aforementioned stressors associated with COVID-19, both individually and cumulatively, may be likely to exceed one's ability to cope with the demands of the stress and manage such challenges (Lazarus & Folkman, 1991). As such, the overall context surrounding the study may have interfered, partially or completely, with both attention and engagement as well as learning and application of intervention material.

The online delivery of the intervention also interfered with the ability to provide validation, empathy, and unconditional positive regard for study participants. Neff (2003) indicated that the goal of compassion-focused therapy (CFT) is to assist in developing a sense of warmth and emotional responsiveness towards oneself through a therapeutic process. The current study, while incorporating exercises from empirically-supported research and protocols, was not structured to adequately and authentically foster a warm and inviting atmosphere for study

participants. An online, self-directed intervention poses significant challenges to providing and demonstrating understanding and empathy for the struggles with weight, body image, and eating habits. It is important to validate the experiences and difficulties of individuals in order to model compassionate behavior and create a willingness to explore painful thought processes. The thin-ideal, drive for muscularity, and restrictive eating habits are considered normative, culturally acceptable, and are reinforced in multiple domains (Fouts & Burggraf, 1999; Gerbner et al., 2002; Hesse-Biber et al., 2006; Murray et al., 2016). These are concepts in which empathy and validation may create flexibility and perspective-taking, enhancing the overall outcomes of a self-compassion intervention. Vilardarga (2009) suggests that empathy consists of a set of congruent emotions that are other-oriented and significantly overlap with compassion and tenderness. Further, training in self-compassion is designed to provide resources surrounding personal inadequacies and failure and thus is primarily aimed at emotional suffering. Due to the painful nature of such suffering, the Mindful Self-Compassion (MSC) program is always led by two clinicians, one of which is a trained therapist to provide support for participants that require attention (Neff, 2003a). In fact, these facilitators are responsible for creating a warm and friendly atmosphere to support discussion of participants' experiences. Modifications to the study procedure due to COVID safety concerns prevented study staff from creating such a safe and welcoming environment and may have played a significant role in study outcomes.

Similarly, the group environment was noticeably absent from the current study due to the online delivery. Group interventions are defined as the events and interchanges that occur in a group treatment session, including participant learning, processing emotional content, modeling effective behavior, and developing cohesion among group members (Yalom & Leszcz, 2005). Group interactions are effective for providing participants with opportunities to learn from other

group members, interact with others who share similar experiences and concerns, and enhance skills as well as obtain feedback from like-minded group members (MacDevitt & Sanislow, 1987; Morgan et al., 1999; Winterowd et al., 2001). Of note, although self-compassion has been adapted for individual delivery, self-compassion interventions have been primarily provided in group settings (Adams & Leary, 2007; Gilbert & Irons, 2005; Gilbert & Procter, 2006; Gilbert, 2009; Neff & Germer, 2013; Williams et al., 2008). The group format enables exercises to facilitate interpersonal engagement in order to generate self-compassion within and between participants (Neff & Germer, 2013). Moreover, sharing self-criticism within small groups emphasizes and facilitates feelings of common humanity, a core component of self-compassion. These aspects were not included in this study's intervention and may have played a prominent role in reducing the potential outcomes for participants in this sample.

Additionally, the length of the intervention may have reduced the potential impact of proposed outcomes. Although the literature on self-compassion has highlighted benefits of brief experiential exercises (Mitchell et al., 2018; Moffitt et al., 2018; Odou & Brinker, 2014; Toole & Craighead, 2016), these results have only demonstrated immediate, short-term effects. In the current study, the intervention, including control group, was approximately one-hour in duration which significantly diverges from the extant literature on online interventions. Online self-compassion interventions that have shown promise have ranged from two-weeks (Kelman et al., 2018) to 10-weeks (Nadeau et al., 2020). It is possible that are stronger dose of the current intervention may have been beneficial for a subset of participants. Another confounding factor of the online format is the restricted impact and availability of experiential exercises to maximize the effectiveness of the intervention. Several experiential exercises included in the in-person intervention were not feasible through an online, self-paced intervention. For example, a mindful

eating exercise (Germer & Neff, 2013) was initially incorporated into the intervention in which participants were to be provided with a piece of candy or chocolate to complete the exercise. However, given the confines of intervention modality and quarantines in effect, this exercise would have been disadvantageous for some participants who did not have access to food appropriate for the exercise. Mindful eating is defined as an open-minded awareness of our decisions to eat (i.e., hunger and satiety cues) and how the food we choose to eat affects our body, feelings, and mind (Fletcher, 2016). Research has suggested that mindful eating may account for eating in response to physiological cues, and, in fact, has been posited to conceptually overlap with intuitive eating (Taylor et al., 2015). Given the focus on body image and eating behaviors, this particular exercise likely would have been beneficial for attending to, or possibly reducing, maladaptive eating behaviors such as emotional eating. Furthermore, mindfulness is a core component of self-compassion and is necessary to facilitate awareness of one's internal experiences and self-critical thoughts. Given the foundational nature of mindfulness for developing self-compassion, the inability to guarantee a safe and distraction free environment as well as to provide a facilitator to guide such exercises may have been a barrier to fully developing the skills to improve self-compassion among study participants. For example, mindfulness is a skill that is developed over time, often requiring prompts to guide attention back to the exercise as well as to facilitate processing upon exercise completion in order to reinforce and validate participants' experiences (Segal et al., 2002).

Additionally, the study recruitment procedure may have also negatively impacted the effectiveness of the intervention on eating behaviors and body image. Data were collected from a convenience sample of undergraduate students enrolled in an introductory psychology course who were seeking to earn credit for course completion at a single southeastern university. While

the current intervention was developed with college students in mind, the sample collected, and therefore the data analyzed, may have been influenced by sampling bias. For example, individuals in the current study may not have been interested or invested in a study related to self-compassion, body image, and eating behaviors. Furthermore, although research shows that disordered eating behaviors and concerns with body image are significantly higher in college students than the general population (Goldschmidt et al., 2018; Luce et al., 2008; O'Dea & Abraham, 2002), these individuals may not have been motivated to address these concerns through treatment engagement and adherence. Additionally, participants may not have identified the perceptions of their bodies or their eating patterns as a source of concern, particularly given that disordered eating and body dissatisfaction are socially accepted and reinforced in Western culture (Hesse-Biber et al., 2006; Fallon et al., 2014). In fact, a 2019 study by Haynes and Robinson examined self-selection bias in eating behavior among undergraduate psychology students (90% female, M_{AGE} = 18.8, M_{BMI} = 21.9). Participants were led to believe they were given a choice between a study on advertising and a study on advertising and eating behavior. Over 70% of students preferred to participate in the study unrelated to eating behavior. Participants who elected to take part in the eating behavior study were more likely to be male than female, had higher self-reported external eating behaviors (e.g., "If you see or smell something delicious, do you have a desire to eat in?") and positive preoccupations with food (e.g., "I really enjoy thinking about food"), and endorsed lower negative preoccupations with food (e.g., "I hate being distracted with thoughts about food") and social appearance anxiety. The authors concluded that self-selection biases should be considered when drawing inferences from studies related to eating behavior, particularly among samples of university-based participants. In other words, individuals who have more self-reported adaptive psychological characteristics

related to eating are more likely to participate and engage in a study associated with eating behavior whereas individuals with higher levels of dysfunctional eating behaviors are prone to avoid such research.

Eating is considered an impression-forming behavior (Vartanian et al., 2007), and judgments and negative perceptions are directed towards individuals based on the quality and quantity of their food choices (Mooney & Lorenz, 1997; Vartanian, 2015). Awareness that food and weight-related behaviors are being monitored has been shown to lead to alterations in these behaviors, albeit temporarily (Robinson et al., 2015; Robinson, Kersbergen, Brunstrom, & Field, 2014). Thus, it seems plausible that individuals with body dissatisfaction, maladaptive eating patterns, and weight-related distress may be less likely to self-select into a study addressing these domains due to concerns of being negatively evaluated. These fears seem feasible given the pervasive, overt criticism regarding weight and weight-related behaviors across a variety of domains (Lewis et al., 2011; Puhl & Brownell, 2006; Sikorski et al., 2015). Within the present study, self-selection bias may have been a hindrance to participation for individuals with concerns with body image and disordered eating as well as higher levels of self-criticism, despite being among the individuals who may have most benefited from the intervention. Although individuals may not have selected out entirely, they may have not fully engaged in the intervention while still participating in order to obtain research credit. As noted above, avoidant behaviors may have interfered with completion and/or engagement in the study overall.

Moreover, an a priori power analysis indicated that a sample of 120 participants would be sufficient to provide 95% power or greater to detect a medium effect size using repeated measures analysis of variance and multiple linear regression. However, the final sample failed to meet this threshold. Of the 1023 participants to complete any part of the study, only 101

individuals completed all three study components, with two individuals being excluded from analyses for invalid responses. Additionally, analyses sought to determine the effectiveness of the intervention across time for individuals who may be more likely to benefit from the intervention by screening for individuals who report lower levels of intuitive eating. This screening sample was comprised of only 21 participants, including 13 who completed the intervention. Prior research has indicated that a sample size of 78 is sufficient for detecting small interaction effects on an independent variable (Shieh, 2011). However, the current study failed to obtain a total sample that would produce adequate power for examining hypothesized outcomes. Thus, the underpowered analyses may have failed to detect small or medium effects of the intervention. However, as elaborated below, this is unlikely due to some of the contraindicated results found from this study.

Finally, additional limitations within the study procedure pertain to the timeline of the intervention and assessment schedule. Participants were required to complete three discrete modules in sequential order, each separated by no less than 5-days between time periods. The amount of time between study periods may not have been sufficient to detect change in outcome variables. Prior to the onset of COVID-19, this study had proposed an elongated timeline, with post-intervention assessment occurring one-week following the active treatment and the follow-up assessment occurring five-weeks following the intervention (see Appendix C for original study flow and assessment schedule). However, university modifications to accommodate smaller classrooms and distance learning transitioned from semesters to quarters, significantly shortening the length of classes and time to earn research credit. A prior longitudinal self-compassion study comprised of an intervention at a single point in time assessed outcomes at two-weeks post-intervention and follow-up at eight-to-nine-weeks, enabling detection of changes

in variables over time (Yadavia et al., 2014). In addition to the schedule for assessment and intervention being modified, it is possible that the accelerated course duration increased student burden by condensing academic requirements into a shortened time frame, hindering engagement in required research studies.

Despite the unanticipated outcomes of the intervention, there were within-subjects reductions in external eating at post-intervention and follow-up. There was a combined effect of reduced external eating among both conditions, with the control condition experiencing a greater mean reduction across time. Additionally, there was a within-subjects effect for intuitive eating at follow-up. There was a combined increase in intuitive eating across conditions, with the control condition demonstrating a slightly greater increase on average compared to the intervention condition. Contrary to what was hypothesized, there were several interactions that exhibited statistical significance. Participants in the treatment condition demonstrated increases in fear of self-compassion from baseline to post-intervention relative to the control condition which demonstrated decreased fear of self-compassion across time. Likewise, there were between-subject effects for fear of self-compassion, with lower levels in the control condition compared to the treatment condition. In contrast to the concept of self-compassion, some individuals express a fear of self-compassion that corresponds to avoidance, discomfort, unfamiliarity, and feelings of loneliness and rejection when encountering positive feelings (Gilbert, 2010; Gilbert et al., 2011). In the current study, there was a moderate negative relationship between self-compassion and fear of self-compassion. Increases in fear of self-compassion within the treatment condition may have corresponded to participants who were unable or unwilling to self-select out of the study or treatment condition despite reluctance to engage in exercises surrounding self-criticism and painful life experiences. Additionally,

difficulties with mindfulness and self-critical thoughts related to unguided experiential exercises may have increased or reinforced dislike of self-compassion overall (Gilbert et al., 2011; 2012).

Additional unanticipated interactions occurred such that participants in the intervention demonstrated increased internalized weight bias and muscle dysmorphia at post-intervention and follow-up whereas, within the control condition, internalized weight bias decreased across time and there were no changes in muscle dysmorphia across time. Examination of an affect regulation model of self-compassion and body image found a moderate inverse relationship between self-compassion and internalized weight bias, and the authors suggested that self-compassion directly and indirectly effects internalized weight bias (Webb & Hardin, 2016). There is considerable conceptual overlap between internalized weight bias and muscle dysmorphia despite distinct literature into each. Internalized weight bias refers to stereotypes and beliefs directed toward oneself about weight, typically overweight and obesity (Durso & Latner, 2008), whereas muscle dysmorphia encompasses rigid, maladaptive beliefs that an individual possesses inadequate muscle mass and excessive body fat (Klimek et al., 2018). The rise in internalized weight bias and muscle dysmorphia among participants in the self-compassion intervention may be due to acceptance of and/or doubling down on culturally acceptable beliefs about an individual's body that have been internalized and reinforced in multiple life domains. Research has shown that, despite successful weight loss, internalized weight bias persists following behavioral weight loss interventions (Carels et al., 2014), suggesting that these beliefs about oneself are not easily modified. As such, the structure and content of the current intervention may have not only been inadequate to create new perspectives on these beliefs but reinforced stigmatizing attitudes regarding participants' bodies. Although these interactions

occurred in the contraindicated direction, it is unlikely the intervention contributed to participant harm given the return to baseline levels of these constructs, on average, seen at follow-up.

While the structure of the control condition does not affect the lack of within-subject differences seen in this study, the control condition may have contributed to unexpected outcomes. This study transitioned from a waitlist control to an active control to adapt to changes due to COVID-19. The active ingredients in the control group could have contributed to some of the effects seen between groups and within the observed interactions. The content of the control condition was comprised of empirically-supported information regarding health behaviors changes for nutrition, exercise, and sleep. Providing information or education alone is insufficient to create changes in behavior (Heath & Heath, 2010). Specifically, motivation and an emotionally charged goal, combined with information in the right context, are necessary for successful behavior change. However, discussing healthy behaviors as they pertain to self-care provided participants options for creating new habits whereas, as previously mentioned, unwelcomed efforts to challenge and alter rigid, core beliefs about oneself and one's behaviors without a supportive and empathic environment may have produced contraindicated effects. Additionally, the advent of a self-care intervention amidst the restrictions and stressful context surrounding the COVID-19 pandemic may have provided an impetus for health behavior change. Prior research examining the efficacy of self-compassion interventions has primarily consisted of waitlist control conditions (Anderson et al., 2015; Neff & Germer, 2013; Toole & Craighead, 2016; Yadavia et al., 2016). Although comparisons of active treatment to a waitlist control are generally regarded as a limitation in psychological research, the current study was designed to test a novel self-compassion intervention for body image and adaptive eating and therefore had no existing empirical support.

Surprisingly, there were minimal differences in outcomes between all participants and participants with low levels of intuitive eating with a few exceptions. First, there were significant within-subjects effects for intuitive eating at post-intervention as well as follow-up, with increases in intuitive eating across time. However, there was a significant interaction for intuitive eating at post-intervention that, contrary to what was hypothesized, there were no changes in levels of intuitive eating for the treatment condition, and there was a significant increase in intuitive eating for the control condition. This was unexpected as the active control was not comprised of any content regarding intuitive eating. It may be that information regarding self-care and recommendations for making behavioral changes may have corresponded to increased awareness to bodily cues for feedback related to the effectiveness of any changes made. Second, consistent with previously identified findings, there was a between-subjects effect for internalized weight bias, with higher levels of weight bias in the intervention condition relative to the control condition. These contraindicated findings for internalized weight bias may have resulted from calling participants attention to painful experiences and thoughts regarding their weight and body without providing adequate empathy, understanding, and resources to effectively reduce discomfort or to be more compassionate with oneself. Again, analyses of differences based on levels of intuitive eating were severely underpowered, and more research is needed to determine whether screening participants on eating behaviors prior to a self-compassion intervention is a necessary step.

Related to the third hypothesis, there were significant differences between men and women across several variables of interest. Specifically, men reported higher levels of self-compassion and body appreciation whereas women endorsed higher levels of restrained eating, emotional eating, external eating, internalized weight bias, muscle dysmorphia, and

psychological inflexibility. At follow-up, the differences remained significant for emotional eating, external eating, and psychological inflexibility, with women reporting higher levels than men. Prior research supports these findings for self-compassion and body image differences. Specifically, women have been shown to be more critical of themselves (DeVore, 2013; Leadbetter et al., 1999) as well as less compassionate (Yarnell et al., 2015) compared to men, and body dissatisfaction is more prevalent among women (Dany & Morin, 2010; Fallon et al., 2014; Gruber, 2007; Hildebrandt et al., 2006). In an examination of self-identified gender and gender role orientation among undergraduates, masculinity was found to be more strongly associated with self-compassion than femininity (Yarnell et al., 2018). Although women tend to display more empathic concern and compassion for others compared to men (Mestre et al., 2009; Sprecher & Fehr, 2005), this does not appear to generalize to how women treat themselves. This increased discrepancy between the levels of self-compassion between men and women may also account for the differences in reported body image concerns and psychological inflexibility. For example, feminine norms of self-sacrifice and perceptions that self-compassion is "selfish" may interfere with women's ability to grant themselves kindness (Neff & Harter, 2002; Robinson et al., 2016), particularly as it related to internalized and reinforced beliefs surrounding their bodies and eating behaviors.

Although men typically endorse higher levels of muscle dysmorphia than women (Zeeck et al., 2018), women reported higher levels of muscle dysmorphia than men in the current study. Moreover, there were significant interactions for gender and muscle dysmorphia as well as condition and muscle dysmorphia at post-intervention and follow-up. The interactions occurred such that men reported increased levels of muscle dysmorphia across time whereas women, particularly in the control group, reported decreased dysmorphia across time. The literature on

body dissatisfaction among men and women have produced separate models, with predominantly thin ideals among women and muscular ideals among men (Grabe et al., 2008; Thompson et al., 1999; Tylka, 2011). However, some men desire a slender, rather than muscular, physique (Hildebrandt et al., 2006), and some women prefer a muscular, rather than a thin body (Gruber, 2007). It is unclear what factors contributed to the interaction in this study. One may speculate that, similar to the aforementioned interactions, muscle dysmorphia may have been strengthened in the treatment condition due to drawing attention to painful experiences. In the control condition, men may have enacted self-care goals related to increased exercise for the purpose of building muscle, thus increasing muscle dysmorphia. On the other hand, women may have created goals related to dieting and weight loss, thereby decreasing levels of muscle dysmorphia. Further research on the relationship between self-compassion and muscle dysmorphia among men and women is still needed.

There were also significant interactions for gender and body appreciation and internalized weight bias at follow-up. For body appreciation, compared to women, men endorsed significantly higher levels at baseline and demonstrated reductions in body appreciation across time within both conditions. Conversely, women exhibited small increases in body appreciation across time. Research has shown that men generally report higher levels of body appreciation than women (He et al., 2020). It is unclear as to how body appreciation decreased for men in the current study. However, a research review of interventions targeting body image found that the use of intuitive eating, self-compassion, cognitive-behavioral therapy, and exercise were effective in promoting positive body image for women but not for men (Guest et al., 2019). While the control condition was not designed to address body image, drawing attention to positive aspects of body image and health behaviors in the current study, within both conditions,

may have been beneficial for women while simultaneously leading men to feel less satisfied with their bodies.

The interaction for gender and internalized weight bias occurred such that internalized weight bias increased for men across time points for both conditions. For women, internalized weight bias decreased across time within both conditions. Prior research has found that women experience higher levels of internalized weight bias than men (Andeyeva et al., 2008; Pearl et al., 2014) whereas men endorse higher levels of anti-fat attitudes, particularly against women (Barnes et al., 2013; Pearl et al., 2012). The differences in internalized weight bias between men and women has been explained, at least in part, to eating behavior (Boswell & White, 2015). Specifically, internalized weight bias is associated with more restrictive eating in women compared to men whereas weight bias internalization in men is associated with higher BMI. The authors suggest that internalized weight bias occurs more frequently in women with lower BMI and has a greater influence on eating-related cognitions, attitudes, and behaviors. Although it is unclear whether these factors hold true for the current study, BMI within the current sample and college population overall is, on average, lower than the general population (Pearl & Puhl, 2019), and it may be that younger individuals with average weight are less susceptible to experience weight-based discrimination which, over time, leads to increased internalized weight bias and its sequelae.

Examination of fear of self-compassion as a moderator between self-compassion and outcome variables of interest produced several significant results. First, there were significant main effects for self-compassion across all three time points for intuitive eating, emotional eating, internalized weight bias, body appreciation, and psychological inflexibility. Self-compassion demonstrated significant main effects for external eating and baseline and post-

intervention and muscle dysmorphia at baseline only. Second, there were significant main effects of fear of self-compassion for psychological inflexibility across all time points as well as internalized weight bias and muscle dysmorphia at post-intervention. These main effects are not surprising considering that, in general, there were strong and moderate correlations between these variables. As described above, this is consistent with prior research between self-compassion as well as fear of self-compassion and eating behaviors and body image. Not surprisingly, there were no differences by condition as a covariate. Perhaps this reflects the overall lack of change in outcome variables across time stemming from the intervention.

There were three significant interactions between fear of self-compassion and self-compassion predicting outcomes. Fear of self-compassion played a significant role in self-compassion outcomes on intuitive eating at baseline and follow-up and was nearly significant (p = .05) at post-intervention. As illustrated in Figure 7, self-compassion had its greatest effect on intuitive eating at low and even moderate levels of fear of self-compassion. However, at high levels of fear of self-compassion, the effect between these variables was no longer significant. Similarly, at follow-up, self-compassion had significant effects on emotional eating when fear of self-compassion was at low or moderate levels, but high levels of fear of self-compassion completely negated this relationship (see Figure 8). These findings reflect prior research highlighting one of the prominent barriers to cultivating self-compassion through various treatments (Gilbert et al., 2011). Fear of self-compassion has been linked to challenges with mindfulness and negative affect (Gilbert et al., 2012). In general, when individuals are most resistant to compassionate experiences and behaviors, self-compassion as well as the benefits of self-compassion are minimal to negligible. In the current study, self-compassion appeared to continue to have an influence on intuitive eating and emotional eating despite mild concerns with

self-compassion. This is consistent with prior literature that showed high levels of fear of self-compassion hindered the effects of self-compassion in a treatment seeking sample of individuals with pathological eating (Kelly et al., 2012).

Examination of moderation analyses using changes in variables across time found significant interactions for restrained eating, external eating, and internalized weight bias post-intervention. Increases in fear of self-compassion between baseline and intervention corresponded to an increased effect of self-compassion on restrained eating and internalized weight bias. The effects were more prominent for internalized weight bias in which the relationship with self-compassion was significant regardless of changes in fear of self-compassion across time (i.e., increased, decreased, or no change). Although the interaction for external eating was significant, the simple slopes were not significant such that increased fear of self-compassion had a small and positive, but insignificant, effect on self-compassion whereas fear of self-compassion has a small and negative, again insignificant, effect on self-compassion. The findings for these interactions are difficult to explain given the aforementioned challenges in creating meaningful changes among variables of interest. These results appear to contrast with the interactions previously described using levels of each variable collected at a specific time point only (i.e., baseline only, post-intervention only, etc.). For internalized weight bias, treatment condition as a covariate was statistically significant, with the control condition decreasing in internalized weight bias across time whereas participants in the intervention were relatively unchanged, on average. Taken together, changes in levels of internalized weight bias may have been most impacted across time by self-compassion when fear of self-compassion had increased, particularly within the control condition. Further research is needed to examine the

moderating effect of fear of self-compassion on body image and eating behaviors within self-compassion interventions.

Even more perplexing than the previously unanticipated findings is the between-subjects effects of home practice on study outcomes. Despite within-subjects effects highlighting improvements in self-compassion, internalized weight bias, muscle dysmorphia, fear of self-compassion, and psychological inflexibility across time, outcomes favored individuals who did not practice skills delivered in the workshop compared to individuals who practiced between one and three times during the week prior to the follow-up assessment. There is an abundance of literature highlighting the effects of homework completion and compliance on treatment outcomes in a therapeutic setting (e.g., Cammin-Nowak et al., 2013; Kazantis et al., 2010; 2016; Mausbach et al., 2010). While the current study differs from a traditional therapeutic relationship in numerous ways (e.g., context, duration, and goals), practice is essential for mastery and the ability to effectively integrate therapeutic skills into one's life. The contraindicated findings related to practice may have occurred due to challenges in adequately learning skills during the intervention. For example, the quality of the exercise delivery as well as the lack of feedback from trained clinicians may have contributed to participants mistakenly developing skills ineptly. Additionally, although participants were encouraged to practice exercises delivered in the intervention and provided with supplementary resources, structure nor specific goals for home practice were not provided. Further, the time frame between the intervention and follow-up may have been insufficient for practicing skills competently. Individuals who endorsed 4 or more days of practice did not experience similar challenges to the moderate practice group. Finally, it may be that individuals higher in self-compassion or who felt confident with implementing skills were less likely to practice. It is unclear as to the factors that contributed to these unanticipated

findings related to home practice. It is possible that additional time, feedback on exercises during the intervention, and structure for performing home practice may have contributed to findings more consistent with literature on homework and outcomes.

Strengths

Despite the numerous challenges associated with the outcomes of this study, the test of a novel approach to address adaptive eating behaviors and body image using a brief, self-paced online self-compassion intervention is considered a strength. The research surrounding compassion-focused and acceptance-based interventions for body image and eating behaviors has grown significantly over the past two decades (Adams & Leary, 2007; Albertson et al., 2015; Butryn et al., 2013; Hill et al., 2014; Kelly & Carter, 2015). Nevertheless, prior to study launch, there was no available research examining outcomes of self-compassion on intuitive eating. Additionally, there is a dearth of evidence for the validity of self-paced online self-compassion interventions. Numerous studies have supported the effectiveness of online self-compassion programs for increasing self-compassion (Mak et al., 2018) as well as reducing symptoms of anxiety and depression (Kelman et al., 2018), stress and burnout (Eriksson et al., 2018), body image concerns (Przezdziecki et al., 2016), binge eating behaviors (Kelly & Carter, 2015), and self-criticism in athletes (Mosewich et al., 2013) among women participants. These interventions consisted of interactive content, primarily through direct feedback from a group facilitator or trained clinician. However, to my knowledge, only one study to date has provided preliminary evidence for the efficacy of a self-paced online self-compassion intervention (Nadeau et al., 2021). Among a non-clinical sample of 57 adult women, a 10-week self-guided online course produced significant increases in self-compassion and decreases in self-judgment, shame, and

perfectionism compared to a waitlist control. The current sought to extend these findings through a self-paced online intervention that was brief in nature to reduce participant burden.

This study filled a gap within the literature by examining gender differences related to self-compassion and intuitive eating. The online interventions previously cited, as well as the bulk of studies highlighting the relationship between self-compassion and eating behaviors and body image concerns, research is scarce comparing relationships between men and women. Additionally, men are often excluded from intervention research in these areas due to potential differences in how these concepts are displayed (Grossbard et al., 2008; Toole & Craighead, 2016). Although the current intervention did not demonstrate effectiveness for improving adaptive eating behaviors and body image, the results confirm prior research on the differences between men and women in these areas. More research is needed to determine whether both men and women equally benefit from self-compassion interventions as well as treatments designed to improve eating intuitively and body image.

Limitations

In addition to the limitations described throughout this discussion, there are several other drawbacks worthy of noting. The generalizability of the outcomes of this study are limited due to the characteristics of the study sample. Although men were included in the study, the overall sample was predominantly women (71%), white (71%), normal weight (M_{BMI} = 24.23), and young (M_{AGE} = 19.3) and does not reflect the general population. The participants in the sample were recruited from a rural university town in the southeastern United States and attending college courses. It is unclear if individuals in urban areas and other regions of the country as well as differing educational outcomes would have similar experiences. As previously noted, the sample size was significantly underpowered and greatly affected the interpretation of the

findings. Further, a larger sample would add to the reliability of the outcomes, regardless of whether the findings are consistent with existing literature.

Future Directions

Self-compassion interventions continue to hold promise for reducing distress associated with body image concerns and disordered eating while also improving positive outcomes such as intuitive eating and body appreciation (Bruce & Ricciardelli, 2016; Guest et al., 2019; Kelly & Carter, 2015). Moreover, given the negative impact of body dissatisfaction on eating behaviors and the persistence of body image concerns and internalized weight bias following behavioral weight loss interventions (Carels et al., 2010), self-compassion may play a vital role in improving weight loss outcomes as well as reducing barriers to successful weight loss maintenance (Rahimi-Ardabili et al., 2018). The support for these relationships is relatively new and is a growing area of research. More studies are needed in order to bolster the preliminary support for self-compassion interventions on eating behaviors, body image, and other weight-related constructs.

Additionally, future research is needed to fill the gap between brief, single exercises targeting self-compassion and sequelae and full, week-long self-compassion programs. Prior research has highlighted the potential for brief self-compassion interventions as a viable method to promote adaptive eating behaviors and body orientation (Augustus-Horvath & Tylka, 2011). Brief interventions are also effective for reducing participant burden, increasing cost-effectiveness, and simultaneously producing comparably health-related outcomes to in-person interventions (Andersson, 2016; Andersson & Titov, 2014; Bennett & Glasgow, 2009; Griffiths et al., 2006; Muñoz, 2010). More research is needed to better understand the mechanisms underlying the outcomes associated with self-compassion interventions to more effectively target

change in a succinct manner. This is particularly relevant for the inclusion of self-compassion in currently existing interventions, such as behavioral weight loss interventions and cognitive behavioral interventions, without substantially extending the resources for delivery these interventions.

The onset of the COVID-19 pandemic created challenges for the majority of humankind around the world. Subsequently, opportunities were abundant for examining the needs of individuals during times of distress. Specifically, research is continuing to accrue highlighting increased fear, panic, concern, despair, irritability, anxious, depressive, trauma and insomnia symptoms, social isolation, loneliness, and increased risk for meeting criteria for depression and an anxiety disorder (Brooks et al., 2020; Hossain et al., 2020; Karasmanaki & Tsantopoulos, 2021; Loades et al., 2020; Lopez-Castro et al., 2020). While it is unclear the degree to which the pandemic affected the outcomes of this study, further research is needed to develop and adapt interventions that are efficacious and accessible during such times of need. For example, self-compassion holds potential for improving psychological outcomes (e.g., depressive and anxious symptoms; Neff, 2003b; Neff et al., 2007; Mills et al., 2007), well-being (Neely et al., 2009), life satisfaction (Neff et al., 2005), happiness and optimism (Neff et al., 2007), and intrinsic motivation (Neff et al., 2005). While countries and individuals around the world continue to rebuild, recover, and increasingly regain their independence following quarantine, future global disasters or crises remain a possibility with an increasing global economy. As such, more research is needed to test the effectiveness of brief, self-paced online interventions that may support the needs and safety of individuals during times of distress.

Conclusion

Based on the findings of the present study, the brief, self-paced online intervention delivered herein did not prove to be an effective means for improving self-compassion, intuitive eating, body appreciation, disordered eating, muscle dysmorphia, and psychological inflexibility. Likewise, a priori hypotheses to screen for levels of intuitive eating were insufficient to determine whether the intervention would be more efficacious for individuals with more maladaptive or less adaptive eating behaviors. Nevertheless, the relationships between self-compassion and outcome variables of interest throughout the study mirror that of the existing literature. Findings from this study, in general, were also consistent with differences between men and women despite a gap in the research for intervention outcomes. Although mechanisms of change were hypothesized and intended for analysis, the lack of differences between the treatment condition and control group prevented exploration in this area. Self-compassion continues to accumulate support for the positive outcomes on a variety of psychosocial factors and health behaviors and is a promising area for enhancing health and well-being. Additionally, fear of self-compassion demonstrated a significant moderating effect on the relationship between self-compassion and intuitive eating as well as emotional eating. While this does not explain the lack of significant findings throughout the study, fear of self-compassion does pose a substantial barrier to engagement in self-compassion interventions. Thus, additional exercises or methods to reduce avoidance and concerns related to positive feelings and positive emotions may be helpful for increasing self-compassion and its associated benefits.

While this study was originally designed to be delivered in-person, the lack of significant findings is helpful for guiding future interventions. The paucity of research surrounding self-compassion interventions on intuitive eating outcomes as well as self-paced online interventions

creates a plethora of avenues for future research. Additionally, the current social and cultural context contributes to and maintains body image disturbance, a toxic food environment, and maladaptive eating patterns, and overly restrictive attempts to lose weight predisposes a large portion of the population to future weight gain, weight cycling, and obesity. Given the challenges associated with achieving and maintaining weight loss outcomes through standard behavioral weight loss interventions, identifying brief, self-paced, and online self-compassion interventions is a critical area for further development. The findings of this study suggest future research will likely need to identify ways to enhance the delivery of experiential exercises that encourage engagement, provide a safe and warm environment for participants, and create flexibility and willingness surrounding painful and difficult experiences in order to undermine internalized and socially accepted beliefs about body image and eating behaviors.

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APPENDIX A: IRB Approval

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2284 ·
rede.ecu.edu/umcirb/

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: Reid Hlavka
CC: Robert Carels
Date: 10/17/2019
Re: UMCIRB 19-002242
Self-compassionate approach to eating behaviors and body image

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) occurred on 10/17/2019. The research study is eligible for review under expedited category # 7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a Final Report application to the UMCIRB prior to the Expected End Date provided in the IRB application. If the study is not completed by this date, an Amendment will need to be submitted to extend the Expected End Date. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Name	Description
AAQ-II.pdf	Surveys and Questionnaires
Adherence	Surveys and Questionnaires
BAS-2	Surveys and Questionnaires
Brief experiential avoidance questionnaire.pdf	Surveys and Questionnaires
DASS-21.pdf	Surveys and Questionnaires
Demographics.docx	Surveys and Questionnaires
Dissertation Proposal	Study Protocol or Grant Application
Dutch Eating Behavior Questinnaire.pdf	Surveys and Questionnaires
EDDS.pdf	Surveys and Questionnaires
Fear of self-compassion.pdf	Surveys and Questionnaires
IES-2.pdf	Surveys and Questionnaires
In-person workshop consent	Consent Forms
MBSRQ-AS.pdf	Surveys and Questionnaires
MDDI.png	Surveys and Questionnaires
Online survey consent	Consent Forms
PHQ-9.pdf	Surveys and Questionnaires
Self Compassion Scale.pdf	Surveys and Questionnaires
SONA Recruitment	Recruitment Documents/Scripts
WBIS-M.docx	Surveys and Questionnaires

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

APPENDIX B: Study Measures

Demographics

1. What is your age?
2. What sex were you assigned at birth?

   Male

   Female
3. How would you describe yourself?

   Female

   Male

   Transgender

   Do not identify as male, female or transgender
4. What is your sexual orientation?

   Gay

   Straight

   Gay or lesbian

   Bisexual

   Other
5. Are you of Hispanic, Latino, or Spanish origin?

   Yes

   No
6. Which category best describes your race?

   African American

   American Indian/Alaskan Native

Asian

Pacific Islander

Caucasian/White

Other

Hispanic/Latino/Latina

Middle Eastern

Other

7. What is your height?
8. What is your weight?
9. Are you currently engaging in weight loss efforts?
10. Rate your level of motivation to lose weight?
11. How satisfied are you with your weight?
12. How satisfied are you with your body?
13. How much do you wish to change your body?
14. How much do you wish to change your weight?

Intuitive Eating Scale – 2

1. I try to avoid certain foods high in fat, carbohydrates, or calories.
2. I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry.
3. If I am craving a certain food, I allow myself to have it.
4. I get mad at myself for eating something unhealthy.
5. I find myself eating when I am lonely, even when I'm not physically hungry.
6. I trust my body to tell me when to eat.

7. I trust my body to tell me what to eat.
8. I trust my body to tell me how much to eat.
9. I have forbidden foods that I don't allow myself to eat.
10. I use food to help me soothe my negative emotions.
11. I find myself eating when I am stressed out, even when I'm not physically hungry.
12. I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort.
13. When I am bored, I do NOT eat just for something to do.
14. When I am lonely, I do NOT turn to food for comfort.
15. I find other ways to cope with stress and anxiety than by eating.
16. I allow myself to eat what food I desire at the moment.
17. I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat.
18. Most of the time, I desire to eat nutritious foods.
19. I mostly eat foods that make my body perform efficiently (well).
20. I mostly eat foods that give my body energy and stamina.
21. I rely on my hunger signals to tell me when to eat.
22. I rely on my fullness (satiety) signals to tell me when to stop eating.
23. I trust my body to tell me when to stop eating.

Dutch Eating Behavior Questionnaire

1. If you have put on weight, do you eat less than you usually do?
2. Do you try to eat less at mealtimes than you would like to eat?

3. How often do you refuse food or drink offered because you are concerned about your weight?
4. Do you watch exactly what you eat?
5. Do you deliberately eat foods that are slimming?
6. When you have eaten too much, do you eat less than usual the following days?'
7. Do you deliberately eat less in order not to become heavier?
8. How often do you try not to eat between meals because you are watching your weight?
9. How often in the evening do you try not to eat because you are watching your weight?
10. Do you take into account your weight with what you eat?
11. Do you have the desire to eat when you are irritated?'
12. Do you have a desire to eat when you have nothing to do?'
13. Do you have a desire to eat when you are depressed or discouraged?'
14. Do you have a desire to eat when you are feeling lonely?'
15. Do you have a desire to eat when somebody lets you down?'
16. Do you have a desire to eat when you are cross?'
17. Do you have a desire to eat when you are approaching something unpleasant to happen?
18. Do you get the desire to eat when you are anxious, worried or tense?
19. Do you have a desire to eat when things are going against you or when things have gone wrong?
20. Do you have a desire to eat when you are frightened?'
21. Do you have a desire to eat when you are disappointed?'
22. Do you have a desire to eat when you are emotionally upset?
23. Do you have a desire to eat when you are bored or restless?'

24. If food tastes good to you, do you eat more than usual?
25. If food smells and looks good, do you cat more than usual?
26. If you see or smell something delicious, do you have a desire to eat it?
27. If you have something delicious to eat, do you eat it straight away?
28. If you walk past the baker do you have the desire to buy something delicious?
29. If you walk past a snack bar or a cafe, do you have the desire to buy something delicious?
30. If you see others eating, do you also have the desire to eat?
31. Can you resist eating delicious foods?
32. Do you eat more than usual, when you see others eating?
33. When preparing a meal are you inclined to eat something?

Body Appreciation Scale-2

1. I respect my body.
2. I feel good about my body.
3. I feel that my body has at least some good qualities.
4. I take a positive attitude towards my body.
5. I am attentive to my body's needs.
6. I feel love for my body.
7. I appreciate the different and unique characteristics of my body.
8. My behavior reveals my positive attitude toward my body (e.g., I hold my head high and smile).
9. I am comfortable in my body.
10. I feel like I am beautiful even if I am different from media images of attractive people.

Muscle Dysmorphic Disorder Inventory

1. I think my body is too skinny/slender.
2. I wear loose clothing so that people can't see my body.
3. I hate my body.
4. I wish I could be heavier.
5. I find my chest to be too small.
6. I think my legs are too thin.
7. I feel like I have too much body fat.
8. I wish my arms were stronger.
9. I am embarrassed to let people see me without a shirt or t-shirt.
10. I feel anxious when I miss one or more days of exercise.
11. I cancel social activities with friends (e.g., watching television, invitations to dinner, going to the movie theater, etc.) because of my workout/exercise schedule.
12. I feel depressed when I miss one or more days of exercise.
13. I miss opportunities to meet new people because of my workout schedule.

Weight Bias Internalization Scale – Modified

1. Because of my weight, I feel that I am just as competent as anyone.
2. I am less attractive than most other people because of my weight.
3. I feel anxious about my weight because of what people might think of me.
4. I wish I could drastically change my weight.
5. Whenever I think a lot about my weight, I feel depressed.
6. I hate myself for my weight.

7. My weight is a major way that I judge my value as a person.
8. I don't feel that I deserve to have a really fulfilling social life, as long as I am my current weight.
9. I am OK being the weight that I am.
10. Because of my weight, I don't feel like my true self.
11. Because of my weight, I don't understand how anyone attractive would want to date me.

Self-Compassion Scale

1. I'm disapproving and judgmental about my own flaws and inadequacies.
2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
5. I try to be loving towards myself when I'm feeling emotional pain.
6. When I fail at something important to me I become consumed by feelings of inadequacy.
7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
8. When times are really difficult, I tend to be tough on myself.
9. When something upsets me I try to keep my emotions in balance.
10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
11. I'm intolerant and impatient towards those aspects of my personality I don't like.

12. When I’m going through a very hard time, I give myself the caring and tenderness I need.
13. When I’m feeling down, I tend to feel like most other people are probably happier than I am.
14. When something painful happens I try to take a balanced view of the situation.
15. I try to see my failings as part of the human condition.
16. When I see aspects of myself that I don’t like, I get down on myself.
17. When I fail at something important to me I try to keep things in perspective.
18. When I’m really struggling, I tend to feel like other people must be having an easier time of it.
19. I’m kind to myself when I’m experiencing suffering.
20. When something upsets me I get carried away with my feelings.
21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
22. When I'm feeling down I try to approach my feelings with curiosity and openness.
23. I’m tolerant of my own flaws and inadequacies.
24. When something painful happens I tend to blow the incident out of proportion.
25. When I fail at something that's important to me, I tend to feel alone in my failure.
26. I try to be understanding and patient towards those aspects of my personality I don't like.

Fear of Self-Compassion

1. I worry that if I develop compassion for myself, I will become dependent on it.
2. I fear that if I become too compassionate to myself, I will lose my self-criticism and my flaws will show.
3. I fear that if I develop compassion for myself, I will become someone I do not want to be.

4. I fear that if I am more self-compassionate, I will become a weak person.
5. I fear that if I am too compassionate toward myself bad things will happen.
6. I fear that if I become kinder and less self-critical to myself then my standard will drop.
7. I fear that if I become too compassionate to myself others will reject me.
8. I would rather not know what being 'kind and compassionate to myself' feels like.
9. I fear that if I start to feel compassion and warmth for myself, I will feel overcome with a sense of loss/grief.
10. When I try and feel kind and warm to myself I just feel kind of empty.
11. I have never felt compassion for myself, so I would not know where to begin to develop these feelings.
12. I feel that I don't deserve to be kind and forgiving toward myself.
13. If I really think about being kind and gentle with myself, it makes me sad.
14. Getting on in life is about being tough rather than compassionate.
15. I find it easier to be critical towards myself rather than compassionate.

Acceptance and Action Questionnaire – II

1. My painful experiences and memories make it difficult for me to live a life that I would value.
2. I'm afraid of my feelings.
3. I worry about not being able to control my worries and feelings.
4. My painful memories prevent me from having a fulfilling life.
5. Emotions cause problems in my life.
6. It seems like most people are handling their lives better than I am.

7. Worries get in the way of my success.

Adherence/Practice

1. How frequently over the past week have you used or practiced self-compassion?

a. If resources were not used, then why not (too pressed for time; did not think it would be useful; did not need to–already self-compassionate; not comfortable with self-compassion exercises; already using different strategies or resources; other [specified])

Questions 2-5 rated using a 5-point Likert-type scale from *Definitely Not* to *Definitely Yes*

2. Have you think you have become more self-compassionate towards yourself?

3. Do you think self-compassion is helpful for coping with body image concerns?

4. Do you think self-compassion is helpful for coping with eating behaviors?

5. Would you recommend self-compassion as a resource to others?

APPENDIX C: Online Intervention Outline

Treatment Group (Self-Compassion)

Education: What is self-compassion?

- Describe compassion (open text response)
- Describe self-compassion (open text response)
- Audio clip describing self-compassion
- Define self-kindness, common humanity, and mindfulness (open text response)
- Audio clip described tenets of self-compassion (e.g., self-kindness, common humanity, mindfulness)

Exercise: How would you treat a loved one?

- Thinking of how one responds to oneself when missing a workout or breaking a diet
- Thinking of how one responds to a friend/loved one when making a mistake/failure
- Open response for reflection

1. Education: Why does self-compassion matter?

- Benefits of self-compassion
- Effects of self-criticism
- Audio clip describing self-criticism scenarios

Exercise: Self-compassion Break

- Audio clip of experiential exercise
- Open response for reflection
- Description of how to practice and benefits of practice

Education: Myths about self-compassion

- Describe your personal fears about self-compassion and societal beliefs about self-compassion (open text response)
- Audio clips contrasting self-compassion with self-pity, self-esteem, and self-indulgence

Exercise: Compassionate Body Scan

- Audio clip of experiential exercise
- Open response for reflection

Exercise: Developing self-compassionate phrases

- Identify situations one is self-critical

- Develop self-compassionate phrase for tenets of self-compassion (open text response for each)

Exercise: Writing self-compassionately

- Background on unrealistic portrayals of body standards
- List the features of your body that you like (open text response)
- List the features of your body that you do not like (open text response)
- Develop and implement kindness and compassion towards self surrounding difficult thoughts and emotions (open text response)
- Writing from perspective of loving imaginary friend

Self-Compassion Beyond This Workshop

- Summary of self-compassion and skills
- Tips for practice and implementation
- Self-compassion resources
- Provide original intervention material PDF

2. Control Group (Self-Care)

Self-Care and Well-Being

- Describe self-care in own words (open text response)
- Audio clip describing self-care
- List activities you do for self-care (open text response)
- Self-care assessment (rate self-care in areas of sleep, nutrition, exercise, alcohol, and relationships from 1 [poor] to 5 [excellent])

3. Why is Self-Care Important?

- Description of stress response
- Description of interaction between self-care and stress response using metaphor of a car

4. Nutrition and Well-Being

- Self-assessment of nutrition (e.g., how often do you skip meals, what devices do you use while eating)
- Audio clip describing nutrition and well-being
- Benefits of a healthy diet
- Foods optimal for a mentally health diet
- Foods to avoid for a mentally healthy diet
- Recommendations for making nutritional changes (e.g., start small, plan ahead, etc.)

5. Exercise and Well-Being

- Self-assessment of exercise (e.g., how many days a week do you engage in physical activity, what type of exercise do you currently engage in)
- Audio clip describing exercise and well-being
- Benefits of exercise
- Exercise ideas (e.g., taking a walk, riding a bike, etc.)
- Write down activities you plan to begin (open text response)

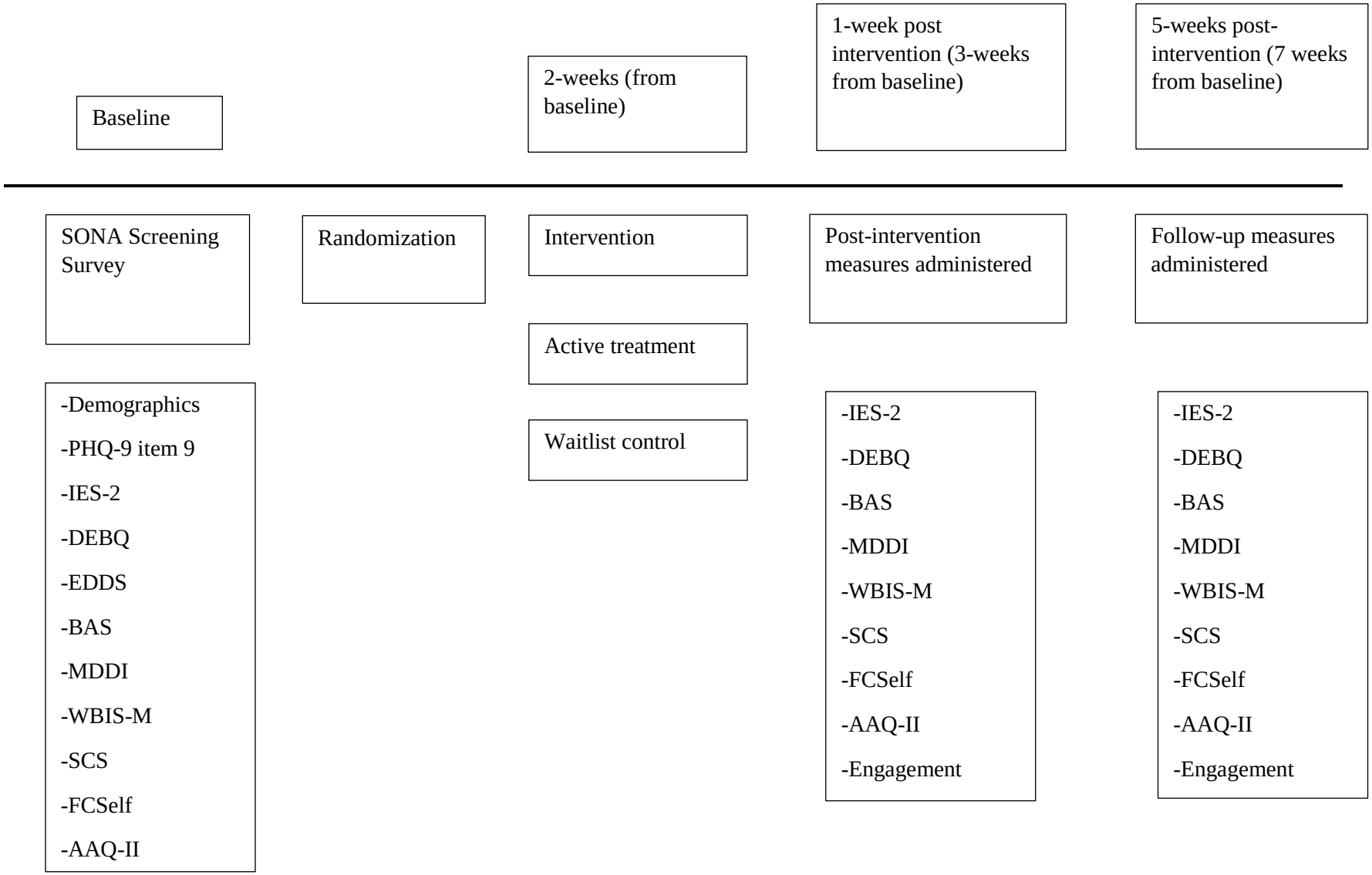
6. Sleep and Well-Being

- Self-assessment of sleep (e.g., how many hours do you average per night, how long do you lay in bed before falling asleep)
- Audio clip describing sleep and well-being
- Benefits of quality sleep
- Recommendations for improving quality and duration of sleep

7. Self-Care Beyond This Study

- Practice tips

APPENDIX D: Original Study Flow and Assessment Schedule



APPENDIX E: Original Intervention Outline

Consent forms and introduction to intervention (~5-minutes)

- Introductions
- Provide overview of intervention and remainder of study (i.e., surveys and credits)
- Guidelines (e.g., not therapy, confidentiality)
- Provide intervention materials

Education: What is self-compassion? (10-minutes)

- Tenets of self-compassion (e.g., self-kindness, common humanity, mindfulness)
- Benefits of self-compassion

Exercise: Self-compassion Break (10-minutes)

- Script
- Discussion

Education: Self-criticism and myths about self-compassion (10-minutes)

- Effects of self-criticism
- What self-compassion is not (e.g., self-pity, self-esteem)

Exercise: How would you treat a loved one? (10-minutes)

- Thinking of how one responds to oneself when missing a workout or breaking a diet
- Thinking of how one responds to a friend/loved one when making a mistake/failure
- Discussion

Education: Mindfulness (~5-minutes)

- Nonjudgmental awareness
- Present moment
- Potential distress

Exercise: Compassionate Body Scan (10-minutes)

- Script
- Discussion

Education: Cultivating self-compassion (~5-minutes)

- Observing criticism
- Importance of outside observer

- Relating to oneself
- Practice

Exercise: Writing self-compassionately (15-minutes)

- Writing about emotions and thoughts about body and eating
- Writing from perspective of loving imaginary friend
- Discussion

Activity: Develop self-compassionate phrases (15-minutes)

- Identify situations one is self-critical
- Reflect tenets of self-compassion
- Discussion

Exercise: Mindful eating (10-minutes)

- Script
- Reflection
- Discussion

Closing (10-minutes)

- Review self-compassion and skills
- Discuss tips for practice and implementation
- Remind participants of follow-up surveys and credit breakdown