Eating, exercise, and quality of life: The role of body image among adult women attempting weight loss

DISSERTATION

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Abstract

Excess weight is a significant contributor to morbidity and mortality in the United States. Unfortunately, overweight and obesity persist despite increased awareness of and access to weight management strategies. Recent efforts focus on identifying factors that prevent individuals from engaging in healthy and sustainable eating and exercise behaviors to facilitate weight loss. Body dissatisfaction is an established risk factor for unhealthy eating and unhealthy exercise behavior. Despite its high prevalence among overweight and obese adults, body dissatisfaction has received limited recognition as a potential barrier to weight loss.

The current study was designed to 1) evaluate the relationship of body dissatisfaction to health behaviors important for weight loss (eating and exercise) and to quality of life, 2) evaluate the treatment effects of a body dissatisfaction intervention developed for adolescent females (the Body Project) among adult women attempting weight loss, and 3) evaluate the effects of the intervention on eating and exercise behavior and on adherence to behavioral recommendations for weight loss.

Forty-four overweight and obese women (71% Caucasian; 37.9 ±7.6 years of age; BMI: 30.5 ± 2.9) were recruited in three cohorts from the Columbus metropolitan area. Prospective participants were screened for eligibility including self-reported body shape and weight concerns and desire for weight loss. Eligible participants completed a 90-

minute baseline assessment including body dissatisfaction, internalization of the thin ideal, eating and exercise behaviors, and quality of life. At the time of baseline assessment, all participants received brief psychoeducation regarding current national guidelines for healthy weight loss. Participants were then randomized to one of two four-week treatment conditions: a control group (n=21) that engaged in daily tracking of dietary intake and physical activity; or an intervention group (n=23) that completed daily tracking in addition to attending four weekly, one-hour body image meetings.

At baseline, greater body dissatisfaction was associated with more emotional eating and lower eating self-efficacy but not with exercise self-efficacy. Higher body dissatisfaction was also associated with lower mental and weight-related quality of life. Stigma moderated the relationship of body dissatisfaction to emotional eating and quality of life while body appreciation moderated the relationship between body image and quality of life. At the end of the four-week intervention period, participants in both conditions achieved BMI reductions and reported reduced body dissatisfaction, and improved mental, physical, and weight-related quality of life. There were no improvements in thin ideal internalization, eating and exercise-related variables, or negative affect in either condition. In addition, there were no differences between conditions in adherence to dietary and physical activity recommendations or daily tracking.

Results of the study confirm that body dissatisfaction is associated with behaviors and beliefs that may impact weight loss, but the body image intervention utilized in the current study failed to produce any unique effect on body image, eating behavior and

exercise behavior, or quality of life beyond the health behavior tracking control condition. The results provide additional support for the growing literature highlighting body image disturbances as a public health concern.

To my number one partner in crime, who has truly loved me through the triumphs and hardships. To my parents, who have unconditionally supported me, guided me, and supplied me with a healthy dose of grit. And to Jeremy and Genise, who I am fortunate to call family but also best friends.

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Fields of Study

Major Field: Psychology

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Chapter 1: Introduction

Obesity is a major public health concern as over two-thirds of Americans are overweight or obese (Bean, Stewart, & Olbrisch, 2008; Ogden, Carroll, Kit, & Flegal, 2012). Obesity is typically defined using Body Mass Index (BMI) which is the calculated ratio of body weight (in kilograms) to height (in meters squared) and is often used as an estimate of body composition. BMI is considered the gold standard proxy measurement for percentage body fat (Centers for Disease Control and Prevention (CDC) 2011), and to categorize individuals as overweight (BMI $\geq$ 25 and < 30) or obese (BMI $\geq$30). Prevalence of obesity has increased among adults in the United States throughout the past decade despite improved knowledge about weight management and the availability of substantial resources devoted to facilitating weight loss (Ogden, Carroll, Fryar, & Flegal, 2015).

The prevalence of excess weight in the United States is alarming because it is associated with increased risk of all-cause mortality (Flegal, Kit, Orpana, & Graubard, 2013; Masters et al., 2013) and has been identified as the fifth leading risk factor for death globally (World Health Organization (WHO) 2009). Excess weight also has been linked to chronic and systemic inflammation (Choi, Joseph, & Pilote, 2013), which may contribute to or mediate the link between body mass and increased risk of medical comorbidity (CDC 2011; Malnick & Knobler, 2006; Pi-Sunyer, 2002). Obesity is

associated with increased risk of cardiovascular disease (Bastien, Poirier, Lemieux, & Despres, 2014), ischemic stroke (Suk et al., 2003), and diabetes (Hinnouho et al., 2015). Excess weight is associated with increased risk for metabolic syndrome, a cluster of symptoms (i.e., elevated blood pressure, elevated blood sugar levels, increased body fat in mid-section, and elevated cholesterol) that places an individual at increased risk of stroke, heart disease, and diabetes (Malnick & Knobler, 2006). Obesity also has been linked to sleep disturbances, ranging from poor subjective ratings of sleep quality to sleep apnea (Ford et al., 2014; Li et al., 2013).

The consequences of excess weight are not limited to medical sequelae, but may include a variety of psychosocial consequences (Fabricatore & Wadden, 2003), including decrements in quality of life which are well documented and pervasive. Generally, obesity is associated with increased risk of experiencing negative affect via a variety of psychosocial mechanisms including but not limited to physical health complications, decreased functional capacity, and distressing interpersonal interactions (Carr, Friedman, & Jaffe, 2007). In turn, obesity is associated with increased risk of low self-esteem (Klaczynski, Goold, & Mudry, 2004) as well as mental illness (Taylor et al., 2012), including eating pathology (Bean et al., 2008; Fabricatore & Wadden, 2003) and depression (Luppino et al., 2010). Obese individuals also encounter adverse interpersonal interactions including weight-related discrimination and stigma in the workplace, health care settings, and among family and friends (Puhl & Brownell, 2003; Wardle & Cooke, 2005). Thus, weight loss is recommended for anyone with a BMI greater than or equal to 25 (Bean et al., 2008). However, several decades of research indicate that many

individuals attempting weight loss do not reduce weight significantly, and maintenance of successful weight loss continues to be a challenge (Bray & Wadden, 2015; MacLean et al., 2015).

Successful weight loss requires creating an energy deficit by consuming less energy or calories through diet and increasing energy expenditure through activity. However, many individuals struggle to maintain behavioral changes due to psychosocial, behavioral, and environmental factors that may make it difficult to sustain a healthy lifestyle (Cooper & Fairburn, 2001; Elfhag & Rossner, 2005; Wardle, 2007). Poor weight management outcomes prospectively predict poor weight loss success in the future (Klem, Wing, McGuire, Seagle, & Hill, 1997), thus efforts increasingly have focused on identifying factors that place an individual at risk for unsuccessful weight loss results. Body dissatisfaction, or displeasure related to one or more features of the body (Cash, 2004), has been identified as one of the psychosocial correlates of obesity that may also function as a barrier to weight loss and consequently reduce treatment success.

Body Dissatisfaction

Body dissatisfaction is subsumed under the multi-faceted construct of body image which is comprised of self-perceptions and attitudes towards the body and its various parts, including associated cognitions, feelings, and behaviors (Cash & Hicks, 1990). Obese individuals report greater body dissatisfaction compared with nonobese individuals. Among formerly obese individuals, body dissatisfaction is attenuated but dysfunctional investment (i.e., overvaluation of physical appearance) and preoccupation with weight persist (Annis, Cash, & Hrabosky, 2004). Studies indicate that obese and

middle-aged women consistently endorse higher rates of body dissatisfaction than women of other BMI groups or age groups (Fallon, Harris, & Johnson, 2014; Fisk, Fallon, Blissmer, & Redding, 2014; Runfola et al., 2013).

Body dissatisfaction may be experienced in relation to any feature of an individual's body, but in western society body weight and shape is a primary focus of body dissatisfaction. In the United States, two factors are believed to exacerbate body dissatisfaction. First, the societal standard of beauty or attractiveness has increasingly valued thinness. Simultaneously, the prevalence of overweight and obesity has increased during this same period of time, such that the average American female is less likely to achieve the societal 'ideal' weight and shape (Dittmar, Halliwell, & Stirling, 2009; Spitzer, Henderson, & Zivian, 1999). Dissatisfaction with body weight and/or shape has been referred to as 'normative distress' due to its prevalence among women in the United States (Mond et al., 2013; Runfola et al., 2013; Swami, Tran, Stieger, & Voracek, 2014). Body dissatisfaction is particularly alarming because of its health-related behavioral correlates and negative relationship with quality of life.

Body dissatisfaction is associated with decreased mental well-being, including increased risk for depression, anxiety, and low self-esteem (Brytek-Matera, 2011; Davison & McCabe, 2005), as well as negative health behaviors. Specifically, body dissatisfaction has been linked to unhealthy eating patterns (restricting food intake, unhealthy dieting, poor food choices) and is a risk factor for eating pathology. It is also associated with over- and under-exercising, less frequent breast cancer self-screens (Ridolfi & Crowther, 2013), greater pro-smoking attitudes (Potter, Pedersen, Chan,

Aubut, & Koval, 2004), and lower likelihood of quitting smoking (King, Matacin, White, & Marcus, 2005). Body dissatisfaction also is associated with decreased health-related quality of life (Wilson, Latner, & Hayashi, 2013; Mond et al., 2013), increased anxiety in romantic relationships (Cash, Theriault, & Annis, 2004), and decrements in sexual functioning (Davison & McCabe, 2005). Preliminary findings link negative body image to greater inflammation (C-reactive protein) after controlling for BMI among women but not men (Bizjak & Jenko-Praznikar, 2014).

Research on body dissatisfaction historically has focused primarily on adolescents, especially young females at risk for eating pathology. However, in the past few years researchers have begun to evaluate body image in more diverse samples. Body dissatisfaction has been documented across age groups (Fallon et al., 2014; Fisk et al., 2014; Runfola et al., 2013), is endorsed by men as well as women (Fallon et al., 2014), is prevalent across race and ethnic groups (Swami et al., 2010), and across varying body weights (Brytek-Matera, 2011). Thus, there is a need for research to better understand correlates of body dissatisfaction among diverse populations, to identify similarities and differences that exist across these groups, and to develop effective interventions to reduce body image disturbances.

Among the understudied groups in this area of research are obese individuals, despite the fact that body dissatisfaction is a common correlate of excess weight (Cash & Roy, 1999; Friedman & Brownell, 1995; Sarwer, Wadden, & Foster, 1998; Schwartz & Brownell, 2004). Body dissatisfaction appears to have important public health implications independent of weight status including negative effects on health behavior

and well-being (Bucchianeri & Neumark-Sztainer, 2014). Therefore, those with both obesity and body dissatisfaction may be particularly vulnerable because excess weight is also associated with negative health behaviors and decreased quality of life (Bean et al., 2008). Preliminary studies have explored the relationship between body image and weight loss (Schwartz & Brownell, 2004), and higher body dissatisfaction has been associated with attrition from weight management treatment (Teixeira et al., 2004) and less weight loss (Teixeira et al., 2002). Further, Palmiera and colleagues (2010) found reduced body dissatisfaction was associated with weight loss at the end of a 4-month weight management program. Those who reported the greatest decrease in body dissatisfaction during treatment also lost more weight at 12-month follow-up, controlling for initial weight loss during active treatment. Thus, improvements in body image appear to be associated with weight loss among weight management participants. Because weight or BMI change is a more distal result of sustained behavior changes, research evaluating body image among weight loss participants may benefit from focusing on more proximal targets of weight loss treatment such as eating and activity level. Indeed, the most compelling conceptual link between body image and weight loss is the robust relationship between body dissatisfaction and health behaviors essential for facilitating weight loss such as eating behavior.

Body dissatisfaction and health behavior

As body dissatisfaction has been reliably linked to unhealthy eating patterns among adolescent females (Bucchianeri & Neumark-Sztainer, 2014; Cash & Fleming, 2002; Mintz & Betz, 1988), it may serve as a barrier to initiating and maintaining dietary

intake and eating behaviors that are sustainable and conducive to weight loss. Altering food intake is essential in creating an energy deficit necessary for weight loss. Individuals attempting weight loss are often encouraged to decrease overall energy intake by reducing calories consumed (Wadden, Butryn, & Byrne, 2004). Additionally, a balanced diet rich in nutrients and low in fat is encouraged (Guenther et al., 2013). Tracking or logging dietary intake is usually recommended as well (Wadden et al., 2004). Successful weight loss and maintenance is associated with continuing to eat a healthy diet and ongoing monitoring of eating behavior (Byrne, Cooper, & Fairburn, 2003; Klem et al., 1997; Thomas, Bond, Phelan, Hill, & Wing, 2014; Wing & Hill, 2001).

However, body dissatisfaction is considered one of the strongest predictors of eating disturbances across the spectrum of eating symptom severity (Phelps, Johnston, & Augustusyniak, 1999; Polivy & Herman, 2002). It is an established risk factor for eating disorder pathology including anorexia nervosa, bulimia nervosa, and binge eating disorder (Jacobi, Hayward, de Zwann, Kraemer, & Agras, 2004). Body dissatisfaction is also associated with subclinical symptoms and unhealthy weight control practices (Neumark-Sztainer, Levine, Smolak, Piran, & Wertheim, 2006; Stice & Shaw, 2002). For example, body dissatisfaction has been associated with dietary restraint (Johnson & Wardle, 2005) and poorer nutritional choices (Robinson, Webb, & Butler-Ajibade, 2011), as well as frequent dieting, self-induced vomiting, and laxative/diet pill use (Moore, 1993). Body dissatisfaction also may be associated with fewer healthy weight control behaviors. In a five-year longitudinal study of body dissatisfaction and health behavior in adolescents, Neumark-Sztainer and colleagues (2006) found body dissatisfaction was

associated cross-sectionally with unhealthy eating behaviors (e.g., binge eating) but also fewer healthy behaviors such as fruit and vegetable intake. Further, body dissatisfaction at baseline prospectively predicted a range of unhealthy weight control behaviors (e.g., skipping meals, diet pills, laxative use) as well as fewer positive health behaviors (e.g., fruit and vegetable intake) during the five-year follow-up period.

Although most research addressing body dissatisfaction has been conducted among young, normal-weight women, there is evidence of a significant relationship between eating behavior and body dissatisfaction among middle-aged women (Slevec & Tiggemann, 2011), and among overweight and obese treatment-seeking individuals (Hrabosky, Masheb, White, & Grilo, 2007; Wardle, Waller, & Rapoport, 2001). Further, research on the relationship between eating behavior and body dissatisfaction is beginning to emerge focused specifically on treatment-seeking obese individuals. Binge eating is strongly correlated with body dissatisfaction, and prevalence of weight and shape concern occurs at similar rates among individuals with binge eating disorder as among other eating disorder groups such as bulimia nervosa (Fichter, Quadflief, & Brandl, 2009; Schwartz & Brownell, 2004). Additionally, fluctuations in body image have been linked to underreporting caloric intake among women initiating behavioral weight management (Maurer Abbott et al., 2008) and to fluctuations in perceptions of calorie content in meals among individuals attempting weight loss (Lattimore & Hutchinson, 2010). Among treatment-seeking obese individuals, Carraca, Silva, et al. (2011) found that change in body image (increased satisfaction and decreased dysfunctional investment) during a 12-month weight management program that included

a body image module was associated with improved eating self-regulation. In addition, Rosen and colleagues (1995) found that obese women reported less guilt after eating and less overeating following a cognitive behavioral intervention for body image with no weight loss components.

Body dissatisfaction also has been linked to physical activity, another integral behavior for successful weight loss and maintenance (Hausenblas & Fallon, 2006; Leary, 1992; Redman et al., 2007; Reel & Hattie, 2007). It is recommended that all adults, including overweight and obese adults attempting weight loss, achieve 150 minutes per week of moderate intensity physical activity (Donnelly et al., 2009). Recent estimates indicate that less than 10% of Americans meet the recommended level of physical activity (Tucker, Welk, & Beyler, 2011). While it is unlikely that physical activity alone is sufficient to facilitate and maintain weight loss (Catenacci & Wyatt, 2007), individuals who successfully lose and maintain weight loss typically engage in regular physical activity (Byrne et al., 2003; Thomas et al., 2014; Wing & Hill, 2001). In addition to altering energy balance, physical activity may benefit mental health by regulating mood (Byrne & Byrne, 1993), and may also help regulate hunger and improve self-regulation of food intake (Vatansever-Ozen, Tiryaki-Sonmez, Bugdayci, & Ozen, 2011). Behavioral weight management programs often encourage participants to increase activity level by increasing exercise duration incrementally each week and by reducing sedentary activity (Wadden et al., 2004).

Body dissatisfaction also may serve as a barrier to exercise, as it has been associated with less frequent physical activity (Leary, 1992; Marsh, Hey, Roche, & Perry,

1997; Neumark-Sztainer et al., 2006; Robinson Webb, & Butler-Ajibade, 2011). McLean and colleagues (2010) found that BMI and higher weight- and shape-related body concerns were associated with decreased physical self-care (including engaging in exercise for self-care and well-being) among a large sample (n=200) of women. Body dissatisfaction also has been positively associated with avoidance of exercise among adult women (McLaren & Kuh, 2008) as well as among overweight and obese adolescents (Stankov, Olds, & Cargo, 2012). In the context of weight loss interventions, decreases in body dissatisfaction have been linked to increased physical activity (Carraca et al., 2012), increased exercise self-efficacy, and decreased barriers to exercise (Teixeira et al., 2006). Accordingly, body dissatisfaction may be an unaddressed obstacle preventing successful initiation and maintenance of exercise among individuals attempting weight loss.

Body dissatisfaction and quality of life

In addition to implications for health behavior and weight loss, body dissatisfaction may be a mechanism through which excess weight impacts psychosocial outcomes like decreased quality of life. Quality of life (QOL) encompasses a wide range of factors from social factors such as role function, to indicators of physical functioning. Quality of life includes both positive and negative aspects of an individual's functional status (Guyatt, Feeny, & Patrick, 1993), generally in the domains of physical, mental, and social well-being (Seidell & Tijhuis, 2002). Health-related quality of life (HRQOL) refers to QOL in the physical health domain. Often both generic and illness-specific measures

of QOL are used to evaluate the impact of a chronic condition on functional status (Guyatt et al., 1993).

Data indicate that excess weight is associated with decreased quality of life and that the impairment is similar to that observed in other chronic conditions such as diabetes or hypertension (Seidell & Tijhuis, 2002). Across various studies, overweight and obese individuals report decreased quality of life compared to normal weight controls (Ford, Moriarty, Zack, Mokdad, & Chapman, 2001; Hassan, Joshi, Madhavan, & Amonkar, 2003; Jia & Lubetkin, 2005), including individuals without obesity-related chronic diseases (Jia & Lubetkin, 2005). Women may be particularly vulnerable to decreased quality of life. In a cross-sectional evaluation of overweight and obese individuals (n=9991), Zabelina and colleagues (2009) found that women reported greater impact of weight on quality of life than did men. Furthermore, in a sample of 4,181 community-residing individuals ranging in BMI from normal to obese, women were more likely than men to experience impairments in HRQOL related to obesity (Mond & Baune, 2009). In addition to serving as an important weight management outcome variable, quality of life may influence an individual's treatment success. In a review of pretreatment predictors of weight loss outcomes, Teixeira and colleagues (2004) found that women who started weight management with lower weight-specific QOL were more likely to drop out or lost less weight if they remained in the program.

Body dissatisfaction may contribute to the relationship between obesity and decreased quality of life. Friedman and colleagues (2002) found that body dissatisfaction partially mediated the relationship between degree of overweight and both depression and

self-esteem among men and women (n=110) attending a residential weight loss facility. Consistent with these findings, Wilson and colleagues (2013) found that body dissatisfaction mediated the relationship between BMI and health-related quality of life among a large sample of undergraduate students (n=414). As body dissatisfaction is linked to decrements in quality of life independent of weight status (Mond et al., 2013), overweight and obese individuals may be particularly vulnerable to decreased well-being.

Weight stigma

Weight-related stigma is a psychosocial variable that may interact with body dissatisfaction to exacerbate negative consequences regarding health behaviors and quality of life outcomes. Stigma was first clearly defined in Goffman's seminal work (1963) as a social process by which an individual, based on holding some undesirable characteristic, is assigned a number of negative attributes. As body dissatisfaction is strongly influenced by societally bound ideals, obesity stigma is also dependent upon socially defined ideas of acceptable body weight. However, stigmatized individuals are not only reminded that their body weight is inconsistent with what is 'societally acceptable' but also that the stigmatized individual has a number of negative attributes as a result of excess weight. Stigmatizing experiences may interact with body dissatisfaction in multiple ways to exacerbate negative outcomes. For example, stigmatizing experiences may be interpreted as 'confirmatory' of negative body image. Such experiences may also increase the frequency of negative thoughts related to body image. Thus stigma may have an overall impact of reminding an individual of the discrepancy between current and ideal weight/shape.

Weight-related stigma has been extensively documented in the U.S. Qualities such as 'lazy, unintelligent, unmotivated, lacking in self-control' are assigned to overweight individuals based on body weight (Puhl, Moss-Racusin, Schwartz, & Brownell, 2008). Visibility of the stigmatized characteristic (e.g., sexuality is visibly concealable while race is not) and controllability (e.g., body weight is controllable while gender is not) are two factors that have been shown to influence the degree of stigmatization (Puhl & Heuer, 2009). As body weight cannot be concealed, and is largely viewed as controllable, overweight and obese individuals are thought to be particularly vulnerable to stigma (Bell & Morgan, 2000; Maddox, Back, & Liederman, 1968; Myers & Rosen, 1999). Further, weight stigma is unusual compared to other commonly studied forms of stigma because overweight/obese individuals often endorse weight-related negative biases while other stigmatized groups often show in-group favoritism (Hebl, King, & Perkins, 2009).

Most obese people report experiencing some form of weight stigma (Friedman, Ashmore, & Applegate, 2008; Myers & Rosen, 1999) and it is prevalent across age groups (Eisenberg, Berge, Fulkerson, & Neumark-Sztainer, 2011). Further, weight stigma has been documented in various forms. For example, the source of the stigmatizing experience may be environmental (e.g., a chair that is too small), interpersonal (e.g., comments from strangers, family members, friends, employers, or health care providers; Puhl & Brownell, 2001) or a stereotypic portrayal of an overweight character in the media (Greenberg, Eastin, Hofshire, Lachlan, & Brownell, 2003; Puhl, Peterson, DePierre, & Luedicke, 2013*).* Weight-related stigma also is associated with weight management outcomes and health behavior (Puhl & Heuer, 2009).

Weight stigma has been linked to eating behavior in various ways. In qualitative studies, individuals report emotional eating (Lewis et al., 2011; Myers & Rosen, 1999; Puhl &Brownell, 2006) and secretive eating (Lewis et al., 2011) in response to stigmatizing experiences. Obesity-related stigma also has been linked to increased caloric intake (Major, Hunger, Bunyan, & Miller, 2013; Schvey, Puhl & Brownell, 2011), decreased eating self-efficacy (Major et al., 2013), as well as refusal to diet (Puhl & Brownell, 2006; Puhl, Moss-Racusin, & Schwartz, 2007). Weight stigma also has been linked to eating pathology. In a large sample (n=1013) of overweight and obese individuals participating in weight management, Puhl, Moss-Racusin, and Schwartz (2007) found that individuals who reported believing negative weight-related stereotypes (i.e., internalized weight bias) also reported higher rates of binge eating behavior. Additionally, individuals primed to think about weight-related stereotypes reported lower eating self-efficacy compared to controls and were less likely to report plans to manage diet (Seacat & Mickelson, 2009).

Weight-related stigma also has been linked to reduced exercise behavior, consistent with Myers and Rosen's (1999) finding that overweight and obese individuals are motivated to avoid situations that may be stigmatizing. Vartanian and Shaprow (2008) evaluated stigmatizing experiences, avoidance of exercise (e.g., I avoid going to the gym when I know a lot of thin people will be there), and physical activity 7-day recall among normal and overweight individuals (n=100). Stigma was associated with avoidance of exercise during the previous 7 days. Similarly, in an observational study of men and women (n=111), weight stigma was associated with exercise avoidance

(Vartanian & Novak, 2011). Anti-fat attitudes (assessed with one item 'I strongly prefer thin people to fat people') moderated the relationship between stigmatizing experiences and avoidance of exercise. Thus, individuals who experienced stigma and also endorsed anti-fat preferences were most likely to report exercise avoidance, but those who experienced stigma and did not endorse anti-fat preferences were protected from the negative influence of stigma on exercise. Schmalz (2010) evaluated stigma and physical activity among participants in a behavioral weight management program. Consciousness of stigma (e.g., awareness of negative stereotypes attributed to a characteristic of the individual) was associated with lower self-reported physical activity competence. Body esteem and BMI were both evaluated as mediators but only body esteem was a mediator of the relationship.

Weight-related stigma has been reliably linked to body dissatisfaction among normal weight, adolescent females, as well as among overweight and obese individuals (Boros & Halmy, 2009; Carraca, Markland, et al., 2011; Gumble & Carels, 2012; Latner, O'Brien, Durso, Brinkman, & MacDonald, 2008; Myers & Rosen, 1999). As the experience of stigma generally is associated with deleterious effects on psychological well-being, eating behavior, and exercise among obese individuals, stigma may exacerbate negative consequences of body dissatisfaction on these outcome variables.

Body Appreciation

While stigma may exacerbate the relationships between negative body image and both poorer health and lower quality of life, body appreciation may serve as a protective factor. Body appreciation is a facet of body image specifically relating to positive

features of body image including positive opinions of an individual's body, recognizing and attending to the body's various needs, engaging in healthy behaviors, and recognizing and resisting unrealistic ideas about body shape and size from the media (Frise´n & Holmqvist, 2010; Wood-Barcalow, Tylka, & Augustus-Horvath, 2010). Many of the features of body appreciation are inconsistent or directly at odds with features of body dissatisfaction. Therefore body appreciation may serve to counteract or at least disrupt an otherwise unchallenged negative body image and thus may mitigate the negative consequences of body dissatisfaction on health and well-being. Body appreciation has been operationalized relatively recently as being unique and distinct from low body dissatisfaction, and preliminary findings suggest that positive body image is not adequately assessed or described by low body dissatisfaction (Avalos, Tylka, & Wood-Barcalow, 2005; Tiggeman & McCourt, 2013).

Body appreciation is negatively associated with BMI (Satinsky, Reece, Dennis, Sanders, & Bardzell, 2012; Webb, Butler-Ajibade, & Robinson, 2014; Wasylkiw & Butler, 2014), and has been associated with greater intuitive eating (Augustus-Horvath & Tylka, 2011; Iannantuono & Tylka, 2012), an adaptive eating pattern that relies on physiological cues of hunger and satiety (Tribole & Resch, 1995; Tylka, 2006), as well as fewer disordered eating symptoms (Jauregui-Lobera, Ezquerra-Cabrera, Carbonero-Carreno, & Ruiz-Prieto, 2013; Jeffers & Benotsch, 2014). Among a large sample of adolescents and their parents (n=383), body appreciation also was associated with endorsing greater importance of healthy eating and greater likelihood of an individual identifying as a healthy eater (Sieukaran, 2014).

Body appreciation also has been linked cross-sectionally to a variety of measures of physical activity. It is positively associated with regular exercise among college women (Homan & Tylka, 2014; Jauregui-Lobera et al., 2013) but the relationship may be attenuated among individuals who report engaging in physical activity for appearance-related reasons (Homan & Tylka, 2014). It also was positively associated with more frequent discussion about exercise among friends and family members and negatively associated with reported discussion of dieting and weight loss (Wasylkiw & Butler, 2014). Endorsing positive body image is associated with readiness to engage in physical activity among morbidly obese individuals (Boros & Halmy, 2009).

Body appreciation predicts well-being (e.g., higher self-esteem and life satisfaction) among college women (Swami et al., 2014) above and beyond body dissatisfaction (Avalos et al., 2005) and is positively associated with greater happiness (Swami et al., 2014). Thus, body appreciation is another correlate of eating, exercise, and quality of life. Because body appreciation is positively associated with weight loss behaviors when controlling for body dissatisfaction (Andrew, Tiggemann, & Clark, 2016), it may serve as a buffer against the deleterious influence of body dissatisfaction on eating, exercise behavior, and well-being. Further, Augustus-Horvath & Tylka (2011) found that early-aged (26-39 years) and middle-aged women (40-65 years) reported lower body appreciation than emerging adult women (18-25 years) suggesting that middle-aged women may be vulnerable to low body appreciation. Thus, examining body appreciation in the context of health behavior change among adult women is warranted and may enhance the understanding of the relationship between body image and health.

Body image intervention: targeting the thin ideal

In light of the relationship between body dissatisfaction and health behavior, it appears that body dissatisfaction may interfere with an individual's ability to engage in the health behavior changes necessary to facilitate weight loss. Although the relationship of body dissatisfaction and health behavior has been largely understudied among overweight and obese individuals, a wealth of intervention literature exists regarding body image intervention among adolescent girls with symptoms of eating pathology. Stice and colleagues have extensively studied the role of internalization of the thin ideal among young adolescent females at risk for eating pathology. Internalization of the thin ideal refers to the degree to which an individual subscribes to and pursues a thin standard of attractiveness. This is exemplified by qualitative data from Engeln-Maddox (2006) who recruited undergraduate females (n=109) and prompted them to consider the media portrayal of the ideal body size for women and how their lives would change if they achieved the thin ideal. While some negative consequences were endorsed, participants primarily imagined positive consequences of achieving the thin ideal (e.g., more self-confidence, increased dating prospects, more opportunities at work). Internalization of the thin ideal has been identified as a pathway between the societal pressure for thinness and negative outcomes, including the more immediate consequence of body dissatisfaction, as well as negative affect and eating disturbances. Thus, internalization of the thin ideal may be a precursor to eating pathology (Stice, Mazotti, Weibel, & Agras, 2000; Thompson & Stice, 2000).

Internalization of the thin ideal has been associated with a number of maladaptive correlates. It has been linked to increased negative affect (Dittmar et al., 2009; Heinberg & Thompson, 1995; Posavac, Posavac, & Posavac, 1998), low self-esteem (Klaczynski et al., 2004), eating disturbances (Ahern, Bennett, Kelly, & Hetherington, 2011; Anschutz, Engels, & Van Strien, 2008; Reina et al., 2013; Stice & Shaw, 2002; Thompson & Stice, 2000), compulsive exercise (Homan, 2010), and decreased body appreciation (Lunde, 2013; Swami & Tovee, 2009). Further, internalization of the thin ideal is robustly linked to body dissatisfaction. In a meta-analysis of cross-sectional studies, Cafri and colleagues (2005) found that internalization of the thin ideal and body dissatisfaction were reliably and positively associated. Further support has come from experimental designs. Meta-analytic reviews of experimental studies document increased negative body image following exposure to media images that reflect the thin ideal (Grabe, Ward, & Hyde, 2008; Groesz, Levine, & Murnen, 2002). The relationship between internalization of the thin ideal and negative body image has been evaluated primarily among young women but has been documented among women of all ages (Bedford & Johnson, 2006; Cash & Henry, 1995).

Stice and colleagues (2000) have found that internalization of the thin ideal is a vulnerability for body dissatisfaction and eating pathology; and it has been linked to various types of eating disturbances that may be relevant for weight loss (increased caloric intake, restrictive/emotional/external eating). However, it also has been found that internalization of the thin ideal is modifiable. In efficacy, effectiveness, and dissemination research, a manualized dissonance-based intervention targeting

internalization of the thin ideal reduces body dissatisfaction and risk of eating pathology among adolescent females (Stice, Rohde, & Shaw, 2013). The manualized, easily implemented protocol makes it desirable for targeting body image, providing both experimental control and reliable effects on body image. The intervention has not been implemented previously among overweight and obese individuals or among adult women despite their vulnerability to body dissatisfaction. Unfortunately, negative body image has been treated primarily as a symptom of obesity and, thus, another facet of quality of life that is expected to improve with weight loss. However, body dissatisfaction is not only prevalent among obese women but appears to disrupt eating behaviors and exercise patterns in ways that may directly prevent successful health behavior changes necessary for weight loss. The existing observational findings suggest that body dissatisfaction may be an important prognostic characteristic among weight management participants. Further research is warranted to systematically and experimentally reduce body dissatisfaction in order to provide a more rigorous test of the interrelationships between body image and eating, exercise, and quality of life among treatment-seeking obese women.

Current study

This study targeted body dissatisfaction among overweight and obese women and evaluated the effects of a randomized intervention on eating behavior, exercise behavior, and quality of life. Study aims and hypotheses are listed below. Hypotheses are grouped as ‘primary’ or ‘secondary’. Primary hypotheses reflect essential research questions and secondary hypotheses are exploratory analyses considered to be less central to the objectives of the study.

Aim #1: Evaluate the interrelationship of body dissatisfaction, health behavior, and quality of life. Explore novel moderators of the relationships.

Primary Hypotheses:

1a-Body dissatisfaction will be negatively associated with eating self-efficacy, exercise self-efficacy, and quality of life; and positively associated with emotional eating.

Secondary Hypotheses:

1b-Stigma will moderate the relationship between body dissatisfaction and eating self-efficacy, exercise self-efficacy, emotional eating, and quality of life.

1c-Body appreciation will moderate the relationship between body dissatisfaction and eating self-efficacy, exercise self-efficacy, emotional eating, and quality of life.

Aim #2: Replicate effects of the Body Project intervention

Primary Hypotheses:

2a-Intervention participants will report a decrease in body dissatisfaction, internalization of the thin ideal, and negative affect at program completion compared to control participants.

Secondary Hypotheses:

2b-Intervention participants will report an increase in body appreciation at program completion compared to control participants.

Aim #3: Evaluate treatment effects on diet and exercise-related variables

Primary Hypotheses:

3a-Intervention participants will report greater improvements in eating and exercise self-efficacy, and reduced emotional eating compared to controls at program completion.

3b-Intervention participants will report improved health-related and weight-related quality of life compared to controls at program completion.

Secondary Hypotheses:

3c-Intervention participants will demonstrate greater adherence to self-monitoring of diet and exercise compared to controls at program completion.

Chapter 2: Methods

Participants and Recruitment

Overweight and obese women interested in weight loss were recruited from the metropolitan Columbus community. Advertisements focused on weight loss in order to target and specifically identify individuals who wanted to lose weight. Sources of recruitment included 1) NIH-funded Researchmatch, an internet site designed to allow researchers to identify potentially eligible subjects, 2) Studysearch, an internet site coordinated by the OSU Center for Clinical and Translational Science to allow individuals to identify studies in which they might be eligible for participation and 3) community flyers. Eligible women were identified as over the age of 25 with BMI $\geq$25 and <35. Participants were prescreened to identify and select women who wanted to lose weight and also endorsed negative body image (answered "yes" to the question "Do you feel dissatisfied with your body because of your weight or your shape?") and internalization of the thin ideal (answered "yes" to the question "Do you feel like your life would be better if you were thinner?"). These screening questions were taken directly from the Body Project Manual as the recommended screening procedures. Exclusion criteria included pregnancy or planning to become pregnant within 2 months, currently breast feeding, having given birth within the past 9 months, menopausal status (although women who reported positive menopausal status as a result of hysterectomy were

included), participating in or planning to participate in a formal weight loss program in the next two months, self-reported eating disorder or substance abuse, physical disability or chronic condition that would impact ability to exercise or lose weight (e.g., injury to lower extremity limiting mobility) and mental or cognitive disorder that would preclude following instructions.

Procedures

- Prescreening
    - Individuals who expressed interest in the study were contacted via telephone to complete a 5-10 minute prescreening assessment to evaluate eligibility for the study. Participants were recruited in three cohorts, and were informed that participation included randomization to one of two intervention groups addressing weight loss. One group required daily tracking of eating and exercise behavior completed at home, and the other group required daily tracking of health behavior in addition to attending a four-week intervention program. Eligible participants were excluded if they were unable to attend the majority of weekly classes due to scheduling conflicts.
- Baseline assessment and health behavior education session
    - All eligible participants completed an individual baseline assessment including both objective and self-report measurements. The assessments were completed by a doctoral-level trainee and an advanced undergraduate research assistant. Height and weight were measured by study staff to

calculate BMI, and waist circumference also was measured. Participants were given a packet of psychosocial questionnaires to complete after all physical measurements were taken.

- All participants received psychoeducational material regarding diet and physical activity recommendations for a healthy lifestyle, and were given a diet log and a pedometer. Key information provided to participants included education regarding BMI, caloric needs, and altering caloric balance for weight loss, as well as national recommendations for Americans regarding dietary intake and physical activity. Participants were encouraged to engage in lifestyle changes to facilitate a healthy rate of weight loss which is typically defined as 1-2 pounds per week. This would translate to a total weight loss ranging from 4-8 pounds during the four week intervention. The importance and role of self-monitoring health behavior for facilitating changes in diet and exercise levels were also reviewed. Participants received training in proper use of the pedometer as well as instructions for completing the diet logs accurately.

- Randomization
  - All participants within each cohort were randomized to one of the study conditions. Study staff were blinded to group assignment until the end of the baseline assessment when the group assignment was revealed.
    - Health behavior tracking condition

- Individuals assigned to this control condition were directed to continue adhering to the healthy lifestyle recommendations provided during the diet and physical activity psychoeducation and to complete the daily dietary and pedometer logs during the 4-week intervention. They had no additional responsibility during the 4-week intervention period.

- Intervention condition
  - The 'Body Project' intervention (Stice et al., 2013) was utilized for the experimental condition, which consists of four weekly, in-person meetings lasting approximately one-hour. The protocol is a dissonance-based group intervention developed to decrease internalization of the thin ideal, improve body image, and decrease risk of eating pathology among adolescent females at-risk for eating disorder pathology. Some of the discussion and activity prompts were modified for the present study so that all content was appropriate for adult women (e.g., rewording "spring break" to "vacation"). However, minimal changes in content were required. Each session included psychoeducation, group discussion, review of out-of-session assignments from the previous week, and assignment of exercises for the upcoming

week. A 15-minute phone session was scheduled to review session material if an individual missed a group meeting.

- The manual was utilized by the group facilitator for this study and handouts included in the manual were copied and given to participants for completion. The intervention manual contained scripted material for group leaders to reference. All sessions were conducted by an advanced doctoral-level trainee from the OSU clinical psychology program.

- Follow-up assessment
  - All participants completed a second assessment which was scheduled four weeks after their baseline assessment. A seven-day window was permitted and therefore assessments were completed 28-35 days following the initial assessment.

Measures

- Demographic and medical history questionnaires were administered only at baseline and included information regarding age, gender, marital status, family size, race, level of education and employment, health history, and weight/dieting history.

The following measures were administered at the baseline assessment and at the second assessment (see Appendix C.).

Objective measures:

- *Body Mass Index* Height (inches) and weight (kilograms) were measured and used to calculate each participant's BMI (kg / m^2) at the beginning and end of the program.
- *Waist circumference* Waist circumference was measured at the midpoint between the lowest rib and top of the iliac crest with the tape measure parallel to the floor. Measurements were taken at the end of a normal expiration. This measurement is an indicator of medical risk associated with body fat distribution.

Self-report measures:

Body image measures

- Body Shape Questionnaire (BSQ: Cooper, Taylor, Cooper, & Fairburn, 1987) The BSQ is a 34-item self-report questionnaire designed to assess body image concerns related to 'feeling fat'. The questionnaire items are answered on a 6-point likert scale indicating frequency of experiencing the feelings during the prior four weeks. The possible scores range from 34-204 with higher scores reflecting more body dissatisfaction. This scale has demonstrated good internal consistency with Cronbach's alpha of 0.92 in the current sample.
- Body Appreciation Scale (BAS: Avalos et al., 2005) The BAS is a 13-item self-report measure designed to assess body appreciation, a positive facet of body image. Items are answered on a 5-point likert scale and scores were shown to be stable over a 3-week period. The average score across all items is utilized for this scale with a possible range of 1-5. Higher scores reflect higher body appreciation.

This scale has demonstrated high reliability in the current sample with a Cronbach's alpha of 0.96.

- Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4: Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) The SATAQ-4 measures the degree to which an individual internalizes the current societally prescribed standards of attractiveness or beauty. The 22-item measure can be used to calculate an average of all items reflecting the total score as well as five subscales; thin ideal internalization, athletic-muscular internalization, pressure from family, pressure from the media, and pressure from peers. The thin ideal internalization subscale was used for this study (items 3, 4, 5, 8, 9). This scale has demonstrated adequate to strong internal reliability (Cronbach's alpha=0.81 in the current sample).

Health Behavior

- Eating self-efficacy Scale (ESES; Glynn & Ruderman, 1986) The ESES is a 25-item scale consisting of two factors assessing eating due to negative affect and eating when it is socially acceptable. Respondents indicate how difficult it is to refrain from overeating in various situations (1-no difficulty to 7-most difficulty). Higher scores on this measure reflect lower eating self-efficacy and total scores range from 25-175. This scale has demonstrated high reliability (Cronbach's alpha=0.93 in the current sample).
- Emotional Eating Scale (EES; Arnow, Kenardy, & Agras, 1995) The EES is a 25-item measure assessing the tendency to eat in response to negative affect. The

measure is highly correlated with binge eating and has good reliability as demonstrated by a Cronbach's alpha of 0.95 in the current sample. Respondents indicate the degree to which various emotions trigger eating behavior, rated on a Likert scale (1-no desire to 5-overwhelming urge). Total scores range from 25-125.

- Self-Efficacy Scale – Exercise (SES-E; Garcia & King, 1991). The SES-E is a 16-item self-report measure on which respondents rate from 0% to 100% the degree of confidence in their ability to exercise in a variety of challenging situations (e.g., when tired, during or following a personal crisis, when depressed). Scores for all items are summed to calculate mean SES-E scores with a range of potential scores from 0-100. Higher scores reflect higher exercise self-efficacy. This scale has demonstrated strong internal reliability (Cronbach's alpha=0.93 in the current sample).

Quality of life

- Impact of Weight on Quality of Life-Lite (IWQOL-L; Kolotkin, Crosby, Kosloski, & Williams, 2001) The IWQOL-Lite is a 31-item obesity-specific measure of health-related quality of life with each item rated on a 5-point likert scale. Higher total scores reflect greater impact of weight on quality of life. Total scores range from 31 to 155. Five subscales (physical function, self-esteem, sexual life, public distress, and work) can also be scored. Internal consistency ranged from 0.74-0.92 for subscales, and Cronbach's alpha was 0.92 for the total score indicating high reliability in the current sample.

- Medical Outcomes Survey, Short Form-36 (SF-36; Ware & Sherbourne, 1992) The SF-36 is a 36-item measure of health-related quality of life. Two composite scores can be generated: the mental component score (MCS) and the physical component score (PCS). T-scores are generated for component scores. The scale demonstrated adequate to high reliability with Cronbach's alphas ranging from 0.72-0.90 for the subscales in the current sample.
- Positive and Negative Affect Schedule (PANAS: Watson, Clark, & Tellegen, 1988) The PANAS is a 20-item measure. Each item is a single word reflecting an emotion and respondents indicate how frequently each emotion has been experienced during a designated time frame (i.e., during the past week, the past month), using a 5-point likert scale. The negative affect subscale was utilized for this study and demonstrated good internal consistency (Cronbach's alphas=0.81 for negative affect). The 'at the current moment' time frame was used to prompt participants' answers. Total scores for the negative affect subscale range from 10-50.

Stigma

- Stigma Impact Scale (SIS; Fife & Wright, 2000) The SIS is a 24-item questionnaire originally developed to examine facets of stigma and assess the impact of perceived stigma among individuals with chronic illnesses. Each item is rated on a 5-point likert scale. The questionnaire includes four subscales representing social rejection, financial insecurity, internalized shame, and social isolation. Total scores range from 0 to 96. Subscale scores range from 0 to 36 for

social rejection, from 0 to 12 for financial insecurity, from 0 to 20 for internalized shame, and from 0 to 28 for social isolation. The term 'illness' has been changed to 'condition' to increase applicability of item content for the current sample. The total score was used for the current study and demonstrated high reliability in the current sample with a Cronbach's alpha of 0.93.

Self-monitoring

- Diet self-monitoring- Participants were provided with log booklets to record their daily food intake including type, quantity, and caloric content of all items**.** Participants were prompted to count the number of different *types* of fruits and vegetables consumed each day in order to monitor and increase the variety of foods consumed in these food groups. Diet logging was evaluated in two ways. First a percent completion score was calculated by dividing the total number of logs submitted by the total number possible (i.e., the number of days between the baseline and time 2 assessment). If a participant entered any of the requested information onto the dietary log, the log was coded as complete. Dietary intake also was scored as the total number of days in which a participant recorded staying within their caloric limit divided by the total number of logs that could be submitted during the four-week intervention period.
- Pedometer steps- Participants were provided with a pedometer to track and provide feedback on their daily activity level. The pedometer logged daily steps and automatically reset each day. Participants were given paper and pencil logs to track their daily step count and to indicate whether they met their daily goal of

10,000 steps. The pedometer logs were scored and evaluated in two ways. First a percent completion score was calculated by dividing the total number of logs submitted by the total number possible (i.e., the number of days between the baseline and time 2 assessment). If a participant entered any of the requested information onto the physical activity log, the log was coded as complete. Steps were scored as total average steps reported during the four-week intervention period.

Program feedback

- Participants randomized to the intervention condition were asked to complete a questionnaire focused on qualitative feedback about their experience in the group sessions.

Treatment Fidelity

Adherence

- The Body Project manual provides adherence scoring forms for all of the sessions (see Appendix D) to assess the degree to which group leaders deliver the intervention as scripted. There are 5-7 key content areas identified for each session and raters indicate on a 1-10 scale (1=No adherence to 10-Perfect adherence) the degree to which the content was delivered in accordance with the manual. For the current study, two independent raters (undergraduate research assistants) viewed DVD recordings of each session for all three cohorts and completed the rating forms. The raters' scores for each individual session were averaged with the possible range of scores being 1-10.

Data Analysis

Statistical Analysis Software (SAS 9.2) was used to complete all analyses. Pearson correlations and analysis of variance were conducted to examine the interrelationship of variables (total Emotional Eating Scale score, total Eating Self-Efficacy Scale score, total Self-Efficacy Scale-Exercise score, total Impact of Weight on Quality of Life score, and the two SF-36 component subscales (mental and physical)) with demographic variables (age, race, BMI, and education).

To evaluate hypothesis 1a, baseline values for all participants for the Body Appreciation Scale, total Emotional Eating Scale score, total Eating Self-Efficacy Scale score, total Self-efficacy Scale-Exercise score, PANAS-negative affect susbscale, total Impact of Weight on Quality of Life score, and the two SF-36 component subscales (mental and physical) were correlated with total Body Shape Questionnaire score at baseline.

For hypothesis 1b, a series of six hierarchical regression analyses were conducted to evaluate stigma as a moderator of the relationship between body dissatisfaction and the six primary outcomes: emotional eating, eating self-efficacy, exercise self-efficacy, and three quality of life indicators. For each regression model, baseline Body Shape Questionnaire and stigma were entered first, followed by the interaction term for stigma and baseline Body Shape Questionnaire predicting baseline total Emotional Eating Scale score, total Eating Self-efficacy Scale score, total Self-efficacy Scale-Exercise score, total Impact of Weight on Quality of life score, and SF-36 component scores. The six regression models were repeated to evaluate hypothesis 1c with body appreciation as a

moderator of the relationship between body dissatisfaction and emotional eating, eating self-efficacy, exercise self-efficacy, and quality of life. The hierarchical regression analyses were conducted with an interaction term for body appreciation and baseline Body Shape Questionnaire predicting baseline total Emotional Eating Scale score, total Eating Self-efficacy Scale score, total Self-efficacy Scale-Exercise score, total Impact of Weight on Quality of Life score and SF-36 component scores.

For the second hypothesis, a series of repeated measures ANOVAs were conducted to evaluate change in target variables among the intervention participants compared to control participants. An intent-to-treat approach was implemented for all of the following analyses. Baseline variables were carried forward to Time 2 for missing data due to attrition. The first model evaluated change in body dissatisfaction from baseline to program completion. The second model evaluated change in internalization of thin ideal from baseline to program completion. The last model evaluated change in negative affect from baseline to program completion.

For the last set of hypotheses (3a and 3b), repeated measures ANOVA and repeated measures multivariate analysis of variance (MANOVA) were conducted. Two separate models were conducted with group (intervention versus control) as a between-subjects variable and time (baseline versus program completion) as a within-subjects variable in each of the models. In the first repeated measures MANOVA, dependent variables included emotional eating and eating self-efficacy. To evaluate change in exercise self-efficacy from baseline to program completion, repeated measures ANOVA was utilized. In the second repeated measures MANOVA, dependent variables included

total Impact of Weight on Quality of Life score and SF-36 component scores. Univariate effects were examined in the presence of a statistically significant interaction for the multivariate analyses. To evaluate hypothesis 3c, ANOVA was conducted to evaluate differences in average caloric intake, diet logging adherence, average pedometer steps, and pedometer logging adherence among treatment participants versus controls.

Chapter 3: Results

Participants were recruited primarily through Researchmatch and Studysearch websites. One hundred seventy-one individuals expressed interest in the study and were screened for eligibility (see Figure 1 for CONSORT Flow Diagram). Eighty-seven failed to meet participation criteria and were excluded; 40 individuals were identified as eligible but failed to initiate participation (i.e., participant lack of interest, conflict with scheduling, scheduled and no-showed or study staff were unable to contact for enrollment). Forty-four women were enrolled in the study. As shown in Table 1, the sample was primarily Caucasian (71%; 18% black or African American, 11% other) with an average age of 37.9 years (SD: 7.6, range: 25-54) and average BMI of 30.5 (SD: 2.9, range: 25-36).

As shown in Table 2, baseline BMI was associated with internalization of the thin ideal, exercise self-efficacy, and mental and physical quality of life. Years of education was associated with body appreciation. Age and race were not associated with study variables (see Tables 2 and 3). Therefore, BMI and education were used as demographic covariates in the remaining analyses evaluating the associated outcome variables. Pearson correlations were calculated to evaluate hypothesis 1a (see Table 4 for interrelationships of all psychosocial variables). Consistent with hypotheses, body dissatisfaction was negatively associated with eating self-efficacy ($r=0.38$, $p=0.01$), weight-related quality of

life (r=0.63, p<.001), and mental quality of life (r=-0.56, p<.001; t=-3.70, p<.001 when controlling for BMI); and positively associated with emotional eating (p=0.43, p=0.003) and negative affect 'at the current moment' (r=0.53, p<.001). Body dissatisfaction was not correlated with physical quality of life or exercise self-efficacy. However, after controlling for BMI the correlation of body dissatisfaction and exercise self-efficacy was noteworthy (t=-1.90, p=0.06). Also, as expected, body dissatisfaction was negatively associated with body appreciation (t=-5.93, p<.001 when controlling for education) and positively associated with perceived stigma.

To evaluate hypothesis 1b, moderation analyses were conducted exploring the interaction of stigma with body dissatisfaction when significant correlations were identified in tests for hypothesis 1a. As shown in Table 5, perceived stigma moderated the relationship between body dissatisfaction and emotional eating (t=-2.02, p=0.05), weight-related quality of life (t=2.22, p=0.03), and negative affect (t=3.74, p<.001). Additional analyses were conducted to probe significant interaction effects. All variables were standardized to account for multicollinearity and significant regression models were rerun evaluating moderating effects at low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of perceived stigma. Body dissatisfaction was positively associated with emotional eating at low (β=0.68, SE=0.19, t=3.61, p<.001) and moderate levels (β=0.36, SE=0.16, t=2.21, p=0.03) of perceived stigma but it was not associated at high levels of stigma (β=0.05, SE=0.26, t=0.19, p=0.85). Body dissatisfaction was associated with weight-related quality of life at moderate (β=0.50, SE=0.12, t=4.06, p<.001) and high (β=0.76, SE=0.20, t=3.91, p<.001) levels of perceived

stigma but was only a trend at low levels of stigma (β=0.24, SE=0.14, t=1.73, p=0.09). Similarly, body dissatisfaction was associated with greater negative affect at moderate (β=0.52, SE=0.13, t=3.97, p<.001) and high (β=0.98, SE=0.21, t=4.76, p<.001) levels of perceived stigma but it was not associated with negative affect at low perceived stigma (β=0.06, SE=0.15, t=0.38, p=0.70). Perceived stigma did not moderate the relationship between body dissatisfaction and eating self-efficacy or mental quality of life.

To evaluate secondary hypothesis 1c, analyses were conducted to evaluate the moderating effect of body appreciation (shown in Table 5). Moderation analyses revealed significant interactions of body dissatisfaction with body appreciation for weight-related quality of life (t=-3.14, p=0.003) and negative affect (t=-4.71, p<.001). Additional analyses were conducted to probe significant interaction effects. All variables were standardized to account for multicollinearity and significant regression models were rerun evaluating moderating effects at low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of body appreciation. Body dissatisfaction was associated with poorer weight-related quality of life at low (β=0.78, SE=0.18, t=4.20, p<.001) and moderate (β=0.44, SE=0.14, t=3.16, p=0.003) levels of body appreciation but body dissatisfaction was not associated with weight-related quality of life among those high in body appreciation (β=0.10, SE=0.17, t=0.62, p=0.54). Similarly, body dissatisfaction was associated with negative affect at low (β=0.80, SE=0.18, t=4.52, p<.001) and moderate (β=0.32, SE=0.13, t=2.38, p=0.02) levels of body appreciation but not at high levels of body appreciation (β=-0.17, SE=0.16, t=-1.05, p=30). Body appreciation did not

moderate the relationship between body dissatisfaction and eating self-efficacy, emotional eating, or mental quality of life.

As shown in Table 6, chi-square analyses and ANOVA indicated no difference between intervention (n=23) and control (n=21) participants on demographic variables including age, race, BMI, BMI class, education, or drop-out rate. Thus, the randomization procedure was successful in creating two demographically comparable groups. Of the forty-four participants enrolled at baseline, thirty-five participants completed the time 2 assessment (intervention n=18; control n=17). In order to conduct the ITT analyses, the baseline value was carried forward for the time 2 assessment for nine individuals who did not complete the time 2 assessment.

Repeated measures ANOVA of BMI indicated a time main effect ($F(1, 43)=7.76$, $p=0.01$) but no time by group interaction. To evaluate treatment effects outlined in the second set of hypotheses, repeated measures ANOVA was utilized. Results revealed a significant time main effect for body dissatisfaction ($F(1, 43)=13.78$, $p<.001$) but no interaction of time by group. There were no significant effects for internalization of the thin ideal or negative affect. There was a time main effect for body appreciation ($F(1, 43)=12.20$, $p=0.001$), with body appreciation increasing in both groups, as shown in Table 7. However, the time main effect was no longer significant when controlling for years of education ($F (1, 42)=0.71$, $p=0.40$).

Multivariate analysis of variance (MANOVA) revealed no treatment effects for eating-related variables including eating self-efficacy and emotional eating. However, there was a significant time by group interaction for the quality of life variables ($F(3,$

41)=5.49, p<.01). Univariate analyses exploring this effect revealed no time by group interactions for individual variables, but there were time main effects for weight-related quality of life (F(1, 42)=16.52, p<.001), mental quality of life (F(1, 42)=9.31, p<.01), and physical quality of life (F(1, 41)=5.54, p=0.02). Repeated measures ANOVA revealed a time main effect for exercise self-efficacy (F(1, 42)=5.31, p=0.03) with self-efficacy decreasing among participants in both treatment conditions. However, this was no longer significant when controlling for BMI at baseline, as shown in Table 7. Analysis of variance was conducted to evaluate group differences in dietary and physical activity log completion. As shown in Table 8, treatment and control participants did not differ in the proportion of dietary (F(1, 34)=0.02, p=0.88) or physical activity logs (F(1, 34)=1.21, p=0.28) completed during the time between the baseline and Time 2 assessments. Additionally, no significant difference was reported in the number of days during which participants stayed within their calorie goal (F(1, 34)=0.96, p=0.33), the number of days participants reached the step count goal of 10,000 steps (F(1, 34)=0.53, p=0.47), or average step count (F(1, 34)=1.82, p=0.19).

A series of descriptive analyses were conducted to evaluate treatment fidelity. Two independent raters provided an adherence score from 1-10 for each content area outlined in the treatment manual. The individual scores assigned for adherence to individual content areas ranged from 8-10 across the two raters with 10 being the modal score. Total adherence (average of all sessions across all cohorts) was 9.8 (±0.20). In additional analyses, average adherence was calculated across sessions (e.g., average adherence for session one across all three cohorts) and across cohorts (average adherence

for each cohort across all four sessions). Adherence for each session (averaged across all three cohorts) ranged from 9.6 (±0.06) to 9.9 (±0.16) and adherence for each cohort (across all four sessions) ranged from 9.5 (±0.23) to 9.9 (±0.15).

Analyses also were conducted among intervention participants to explore the impact of group attendance on outcome variables. The mean number of classes attended was 3.1 (±1.5; range: 0-4), Attendance did not significantly differ across the three cohorts ($F(2, 20)=0.92$, $p=0.41$), or by race ($F(3, 19)=1.67$, $p=0.21$), and it was not associated with age ($r=0.33$, $p=0.13$) or education ($r=0.37$, $p=0.08$). Regression models were conducted utilizing an intent-to-treat approach to evaluate the relationship between attendance and change in select outcome variables at time 2 (i.e., for each model the time 2 values were entered as the dependent variable and baseline values were entered as a covariate). Higher attendance was associated with reduced body dissatisfaction ($t=-2.74$, $p=.01$) and internalization of the thin ideal ($t=-2.71$, $p=.01$) at time 2 but was not associated with changes in body appreciation ($t=1.49$, $p=0.15$), negative affect ($t=-0.18$, $p=0.86$) or BMI ($t=-1.67$, $p=0.11$). Additionally, attendance was significantly associated with completion of dietary logs ($r=0.83$, $p<.001$) and physical activity logs ($r=0.70$, $p=.001$). Interestingly, there was a trend toward body dissatisfaction being associated with attrition from the intervention condition ($F(1, 21)=4.09$, $p=0.06$) indicating that individuals who discontinued the program reported greater body dissatisfaction at baseline compared to those who completed the time 2 assessment.

Chapter 4: Discussion

Greater body dissatisfaction in the current sample of overweight and obese women was associated with greater difficulty controlling urges to eat and more emotional eating. The results are consistent with studies of younger adults and adolescents documenting a relationship between body dissatisfaction and disordered eating. Eating self-efficacy and emotional eating are both predictive of poor weight management treatment outcome (Linde, Rothman, Baldwin, & Jeffery, 2006). Therefore, this documented link between body dissatisfaction and obesity-related eating disturbances suggests that body dissatisfaction may present a barrier to initiating and sustaining behaviors that are necessary for weight loss. In turn, negative body image may contribute to poor weight management outcomes.

Body dissatisfaction was not associated with exercise self-efficacy in the current sample. This may reflect that body dissatisfaction truly is not relevant for exercise behavior among adult, overweight or obese women. However, it is possible that the narrow scope of the measure used in this study did not adequately capture exercise behavior. The Self-efficacy Scale-Exercise assesses confidence in one's ability to complete exercise in the face of various barriers (e.g., fatigue, bad weather). Maintaining an exercise routine requires multiple steps including planning, initiation, execution, and habituation (Phillips & Gardner, 2016). Body dissatisfaction may not be associated with

self-efficacy in the context of exercise, but it may be associated with other aspects of exercise behavior (e.g., avoidance of exercise, motivation to be physically active, duration or maintenance of exercise). Similarly, body image is multi-faceted and it is possible that other components of body image may be relevant for exercise behavior. Post hoc analyses indicate that exercise self-efficacy was not associated with internalization of the thin ideal ($r=-.04$, $p=.81$) but was positively associated with body appreciation ($r=.45$, $p=.002$), suggesting that positive body image may be more relevant than negative body image for understanding exercise self-efficacy in this population.

Although previous research has documented an association between body dissatisfaction and both mental and physical quality of life in the general population (Mond et al., 2013), body dissatisfaction was not associated with physical quality of life in the current study. In the current sample BMI was strongly associated with reduced physical quality of life while few psychosocial predictors were associated with this facet of quality of life. Conversely, body dissatisfaction was associated with reduced mental and weight-related quality of life even when controlling for BMI. The results suggest that body dissatisfaction may be relevant for specific aspects of quality of life among adult women attempting weight loss. This is consistent with previous research indicating that weight status is not the only factor impacting well-being among overweight adults attempting to lose weight. In fact, Kolotkin, Crosby, Williams, and colleagues (2001) found that only a subset of individuals who lose a significant amount of weight also observe clinically meaningful improvements in quality of life. Therefore it is important to elucidate the factors that contribute to well-being. Results of this study suggest that

negative body image is an important contributor to mental and weight-related quality of life among women attempting weight loss while physical quality of life may less likely to be influenced by psychosocial factors.

The cross-sectional data from this study bolster preliminary findings that body dissatisfaction is present among adult women. As shown in Table 9, participants in the current study endorsed levels of body dissatisfaction comparable to a sample of college students from previous research (Rosen, Jones, Ramirez, & Waxman, 1995). Body dissatisfaction was higher compared with a non-clinical sample (e.g., university staff). However, average body dissatisfaction scores were lower than that documented among individuals seeking body image therapy and among obese dieters. The elevated symptom presentation compared with nonclinical samples emphasizes the relevance of negative body image for women attempting weight loss.

Moderating effects of stigma highlight the influence of both intra-individual and inter-individual processes contributing to the role of negative body image among women attempting weight loss. Body dissatisfaction was strongly associated with both weight-related quality of life and negative affect only in the context of higher levels of perceived stigma. Thus, lower perceptions of stigma related to body weight may help protect against the negative ramifications of body dissatisfaction on well-being. Surprisingly, body dissatisfaction was most strongly associated with emotional eating among those reporting low stigma but it was not associated with emotional eating among those reporting the highest levels of stigma. Importantly, those who reported higher stigma endorsed elevated levels of emotional eating irrespective of body dissatisfaction. These

findings are consistent with the increasingly supported link between weight stigmatization and unhealthy eating behaviors, most recently delineated in the 'Cyclic obesity/weight-based stigma model' highlighting the link between weight bias and consequent weight gain (Tomiyama, 2014). The relationship between stigma and increased emotional eating in the current study provides additional support for counter-intuitive effects of weight stigma on health behavior. The findings also indicate that body dissatisfaction may be less relevant for eating behavior among those who endorse greater perceived weight stigma.

While stigma appeared to exacerbate negative effects of body dissatisfaction, body appreciation appeared to provide a protective effect, buffering against the deleterious effects of body dissatisfaction on well-being. Specifically, when body appreciation is higher, the negative consequences of body dissatisfaction appear to be nullified, at least for some of the facets of quality of life explored in the current study. This is consistent with recent research demonstrating that women with higher body appreciation do not experience an increase in body dissatisfaction following exposure to thin ideal media messages, but individuals with lower body appreciation report increased body dissatisfaction (Andrew, Tiggemann, & Clark, 2015). Thus, in addition to targeting body dissatisfaction in weight management interventions, body appreciation may be another important target of intervention to mitigate negative consequences of body image disturbances. Additionally, because body dissatisfaction was not associated with reduced quality of life in the context of greater body appreciation, targeting body dissatisfaction

may not be an appropriate focus of intervention among individuals with higher body appreciation.

Of note, the two moderators evaluated (body appreciation and perceived stigma) were strongly and negatively correlated in the current sample (as shown in table 4) and interacted with body dissatisfaction in similar ways (i.e., similar outcome variables were moderated by both perceived stigma and body appreciation). Although conceptually distinct constructs, it remains unclear if body appreciation and perceived stigma are accounting for unique variance. In turn, this may indicate that the moderation analyses actually reflect the shared effects of a third underlying variable. At the same time, the two variables are not consistently associated with other study constructs (as shown in Table 4), leaving the nature of the relationship between body appreciation and perceived stigma unclear. As efforts increasingly aim to understand obesity-related stigma and to broaden the conceptualization of body image through incorporation of positive facets, it will be important to delineate the potential overlap and unique contributions of these related constructs.

The treatment effects of the Body Project intervention documented in previous research were not replicated in the current sample of overweight or obese, adult women. A high level of adherence to the treatment protocol was documented indicating that the intervention was delivered to this novel population as intended by treatment developers. Therefore, differences in the study populations may have contributed to the null findings. The Body Project intervention was specifically designed to target body dissatisfaction among young, normal weight females (typically under the age of 25). Therefore,

developmental differences between the study samples may have contributed to discrepancies in treatment outcome. For example, adult women may have a longer history of body dissatisfaction, causing the negative thoughts and attitudes to be more resistant to change. Accordingly, the intervention effects may be attenuated among adult women who are overweight. The dissonance-based approach to treatment relies on the participant's ability to undermine and challenge unrealistic ideas about the 'ideal' female body. A longer intervention program may have been needed for adult participants to both process societal messages about body ideals and to change their own thoughts and behaviors accordingly. Also, incorporating a didactic component that more explicitly addresses societally-driven, unhealthy body-related messages may have been beneficial for individuals who had not previously considered that societal beauty standards are unrealistic.

The Body Project intervention was initially developed as a preventative program. This is another discrepancy between the original use of the intervention and the implementation in the current study. In the original studies, the goal was to improve negative body image to reduce the likelihood of unhealthy eating behaviors. In the current study, it was implemented as a treatment program with the goal of reducing unsustainable and unhealthy dieting behaviors in the context of modifying eating and exercise to facilitate weight loss. Thus, the original implementation provided support for participants changing their body image, but in the current study participants were encouraged to change their body image at the same time they were attempting weight loss. This focus on more than one treatment target (e.g., negative body image, eating and

exercise, weight loss) may have complicated participants' experience with the body image intervention as they were also engaging in multiple cognitive and behavioral changes during the study. Additionally, a strong reduction in body dissatisfaction was endorsed by control participants. This indicates that the Body Project may not have been potent enough to provide additional body image-related benefits beyond the effects of engaging in the process of weight management. Further, some of the measures used in the current study differed from prior studies because they were chosen due to relevance for the target population. For example, emotional eating and eating self-efficacy were evaluated in the current study as these facets of eating are well-documented barriers to weight loss. In contrast, the original studies utilized a measure of restrained eating because restricted food consumption was the primary target of intervention. Consequently, adaptation of methodological features to address the needs of adult overweight women in this study may have contributed to the absence of treatment effects.

The documented change in body dissatisfaction among both intervention and control participants is intriguing. These comparable changes are especially important to consider in the context of the brief and low-dose nature of both protocols. The weight loss directions provided to all participants across treatment conditions represent the gold standard behavioral weight management guidelines (e.g., reducing caloric intake, increasing activity, and monitoring both food intake and exercise). However, there was minimal contact with participants (particularly in the control condition which did not include weekly meetings) and the length of the program was brief (only 4 weeks compared with a standard 12-week program). The results suggest that body

dissatisfaction is modifiable in this age and weight group. Because the intervention group and the control group reported similar reductions in body dissatisfaction, the mechanism leading to these changes is not clear. As weight change may have an impact on body image, exploratory analyses were conducted to evaluate treatment effects on body dissatisfaction, controlling for change in BMI. The decrease in body dissatisfaction remained significant when controlling for weight loss suggesting that improvements in body image cannot be attributed to weight change alone.

It also is important to consider the lack of change in internalization of the thin ideal. There are multiple potential explanations for this finding. It is possible that attitudes and ideas about the ideal body (e.g., extreme thinness) are more resistant to change among older age groups. At a minimum, societally perpetuated ideas may be more canalized among older women due to a longer period of exposure to these pressures. It also is possible that the intervention utilized was too brief to process and undermine the beauty standards in the current sample. Anecdotally, many participants reported increased awareness of subtle ways that beauty information was promoted that they had not noticed prior to participating in the study. It may require more than four weeks to increase awareness, target unhealthy messages, and reduce internalization of the thin ideal in this population. It is also possible that the intervention may not be the most effective program to target internalized thin ideal and body dissatisfaction among adult women who are attempting weight loss.

Body dissatisfaction decreased across conditions despite the lack of change in thin ideal internalization. This suggests that the model of pathology utilized to inform and

develop the Body Project for young, normal weight females may not be applicable among adult women who are overweight. Similarly, no change was observed in eating self-efficacy or emotional eating among study participants in either condition despite positive changes in body image variables. Given the brevity of the intervention, there may be a delayed effect in which the impact of improved body image is observed in health behavior outcomes at a later time.

Surprisingly, both groups reported decreased exercise self-efficacy. Exploratory analyses were conducted to evaluate additional exercise-related variables that might elucidate the finding. When average number of steps per day was entered as a covariate into the repeated measures ANOVA of exercise self-efficacy, the time effect was no longer significant. This suggests that participants' average step count during the four-week period of time may have contributed to feeling less confident in their ability to exercise in the face of obstacles. The average step count reported by participants across conditions was approximately 6250 steps which is notably lower than the recommended 10,000 steps per day. Further, only two individuals (one in each condition) achieved an average step count that was equal to or exceeded 10,000 steps. Increased awareness of this discrepancy through daily logging may have served to undermine the participants' confidence in their ability to remain physically active. Because exercise self-efficacy was negatively associated with BMI at baseline, the repeated measures ANOVA of self-efficacy was conducted again with BMI at baseline entered as a covariate. There was no longer a significant time main effect suggesting that baseline weight may influence perceptions of exercise self-efficacy during weight management.

Both groups endorsed improvements in mental and weight-related quality of life at program completion, but no group differences were evident. The time main effect remained significant when controlling for BMI change. In post hoc analyses, the change observed in mental and weight-related quality of life was correlated with change in body dissatisfaction across both treatment groups. In contrast, there was no significant change in physical quality of life. This is less surprising as the amount of weight loss was statistically significant but modest in this brief intervention, and physical quality of life is most likely to improve as a result of weight loss (Kolotkin, Gadde, Peterson, & Crosby, 2015). Interestingly, when baseline BMI was statistically controlled, a significant main effect of time emerged for physical quality of life. These findings are consistent with the cross-sectional results evaluating the relationships between quality of life and body dissatisfaction. Specifically, physical quality of life appears to be influenced by weight status while mental and weight-related quality of life among adult women attempting weight loss appear to be vulnerable to perceptions of the body. Body image partially mediates the relationship between weight status and both depression and self-esteem among treatment-seeking obese men and women (Friedman et al., 2002). Results of the current study further suggest that body dissatisfaction contributes to reduced quality of life among treatment-seeking obese women but that it might not be an important factor across all facets of well-being. As quality of life is an important marker of treatment outcome in addition to weight loss, these results in combination with the cross-sectional findings suggest that different kinds of interventions may be needed to address the various components of quality of life among treatment-seeking overweight women.

Weight loss may be sufficient to address poor physical quality of life among those seeking weight management treatment. However, targeting body image may be important for improving mental and weight-related quality of life in addition to facilitating weight loss among those with body image concerns.

Although there were no significant differences between intervention and control participants on any of the dietary and physical activity log measures, the data may provide insight into participant adherence to weight loss recommendations. Participants reported meeting the step goal of 10,000 steps less than 30% of the time. While the recommendation for individuals to reach 10,000 steps/day has been identified in previous research as an appropriate guideline to reduce sedentary time among women (Wilde, Sidman, & Corbin, 2001), the majority of individuals in the current study were unable to achieve this goal with any regularity. Their failure to achieve the step goal on average is consistent with previous research indicating that many individuals struggle to decrease sedentary time. Additionally, body dissatisfaction, body appreciation, and internalization of the thin ideal were not associated with step count in the current study. Understanding factors that facilitate or interfere with increasing daily step count is an important area for future intervention; however the current findings suggest that body image may not be an important target of such research.

Participants reported staying within their dietary goal for weight loss less than 50% of the time, consuming less than 1 fruit per day, and between 2-3 vegetables per day on average. As participants were specifically directed to focus on increasing the variety of fruits and vegetables they were consuming, these findings suggest that adhering to

dietary recommendations also was challenging for participants. The low rates of adherence are surprising in light of the significant reduction in BMI observed during the four weeks of this study. Studying dietary intake is notoriously challenging because it is particularly vulnerable to bias and error. Thus, results should be interpreted cautiously as no standardized evaluation of food intake was conducted (e.g., 24-hour food recall). However, the findings are consistent with previous research indicating 90% of individuals do not meet USDA Dietary guidelines for Americans (Briefel & Johnson, 2004). Because altering dietary intake is an essential pathway to weight loss, more research is needed to understand the challenges that prevent and promote adherence to healthy dietary recommendations and reduced caloric intake.

Post hoc analyses were conducted to explore the relationship between self-monitoring and weight loss. Completion of dietary logs was associated with reduced BMI ($t=-2.74$, $p=.01$) at the second assessment but completion of physical activity logs, daily step count, and fruit and vegetable intake were not associated with BMI change. This is consistent with data indicating that self-monitoring of dietary intake, specifically through logging, is one of the most reliable predictors of successful weight loss (Burke, Wang, & Sevick, 2011). However, most studies evaluating self-monitoring exceed 6 months in length. The current study contributes to the self-monitoring literature by documenting the relationship between logging dietary intake and weight loss within a four-week period. The data suggest that meaningful variability in adherence to dietary logging is evident within a relatively brief period and that differences in logging are linked to weight loss success. Observation of logging adherence during the initial weeks of weight

management may facilitate early identification of individuals at risk for poor adherence to self-monitoring. Early identification may provide an opportunity to intervene and improve weight loss among those at risk for poor treatment outcome.

Information was collected from intervention participants to measure group attendance and to evaluate feedback regarding the group material. Overall, participants rated the content positively and were receptive to the body image material (see Table 10). Over 73% of participants attended or received material for all four group sessions. The open-ended feedback provided by group participants also was informative in reflecting participant response to the material. Common themes included an appreciation for the shared experience of struggling with body image concerns. Participants also reported feeling challenged in a positive way to identify negative thought patterns and to work to improve the way they thought about and talked about their bodies. One individual reported having a hard time reconciling the idea of accepting or appreciating her body while actively trying to change her weight. This same concept also emerged during the group discussions. Several individuals reported feeling worse after completing the between-group exercises (see Table 11 for examples of both positive and negative feedback).

Some of the study procedures may have impacted the results of the study and are worthy of consideration. The screening questions utilized to identify individuals who endorse both body dissatisfaction (‘do you feel dissatisfied with your body because of your weight or your shape?’) and internalization of the thin ideal (‘do you feel like life would be better if you were thinner?’) were taken from the study manual utilized for the

intervention. This approach did not exclusively capture the target group for this study. Although there is not a clinical cutoff available for the Body Shape Questionnaire, a prior study identified a score of less than 80 as indicating no body shape concerns (Taylor, 1987). Thirteen of the individuals enrolled in the study scored below 80 suggesting that those individuals may not have been ideal participants in the intervention. Thus, the screening questions used in the original intervention may be less likely to identify pathology among overweight and obese women despite affirmative answers to the same questions being indicative of pathology among normal weight adolescents.

Due to the substantial proportion of subjects with lower body shape concerns, the treatment data were re-analyzed excluding individuals who did not endorse body dissatisfaction at the baseline assessment. These analyses also excluded individuals in the intervention condition who did not attend all group meetings in order to account for treatment fidelity (e.g., specifically 'receipt of treatment' as outlined by the Behavioral Change Consortium comprehensive model of treatment fidelity; Bellg et al., 2004). The resulting two groups were balanced (n=13 in each condition). Repeated measures ANOVA indicated a time main effect, with both groups reporting reductions in body dissatisfaction at time 2 ($F(1, 24)=23.17$, $p<.001$), but no time by group interaction. However, a group by time effect was revealed for body appreciation ($F(1, 24)=4.48$, $p=.04$) and there was a trend toward a group by time interaction for internalization of the thin ideal ($F(1, 23)=3.35$, $p=0.08$). As shown in Table 12, body dissatisfaction decreased in both groups, but body appreciation and internalization of the thin ideal improved only among intervention participants. Further, BMI significantly decreased among

intervention participants but did not change among controls. Thus, the post hoc analyses suggest positive treatment effects among participants who are most likely to benefit from the intervention. The results are particularly compelling given the limited power to detect effects as a result of the small sample size.

Limitations

There are limitations of the current study that must be considered. The target sample size was identified as n=60, however it was not possible to recruit and/or enroll enough individuals who met study criteria to fulfill the target number. While there was substantial interest, many individuals failed to meet study eligibility criteria or did not initiate participation despite eligibility. Although the goal was to run three cohorts of approximately n=20, a portion of participants failed to initiate study procedures which resulted in three cohorts with less than the target number of participants. After running three cohorts, recruitment resources had been exhausted. While the sample size provides sufficient power according to the power analysis conducted prior to initiating the study, the effects used to calculate these values were based on intervention effects observed in normal weight, adolescent females. The effect size may be smaller among adult, overweight and obese women. Based on the effect observed in the subset of the sample who endorsed body dissatisfaction at baseline (n=26), a sample of forty-two would be required to observe a time by group interaction for body dissatisfaction.

Factors related to the control condition may serve as threats to the internal validity of the study. An active control condition was utilized, implementing components of the gold standard approach to weight management. However, participants in this condition did not

attend weekly group sessions, resulting in differences between groups in the amount of time spent engaging in study procedures as well as differences in social contact. The approach provided a number of methodological advantages, including testing the unique additive effects of the Body Project intervention and providing a more rigorous test of intervention effects than a wait list-control condition. However, social comparison has been extensively documented as a contributor to body dissatisfaction (Myers & Crowther, 2009). Because participants in the treatment condition were systematically exposed to other women, providing an opportunity to engage in social comparison (with positive or negative effects), the social aspect of the intervention may have created 'noise' in the data because of the lack of control for this element of the group. Participants also were aware of the differences between the two conditions in regard to structure as they were required to agree to both conditions as part of the consent procedures (i.e., the content of the group meetings was not revealed to control participants but participants were aware that one group included weekly meetings while the other group did not). This awareness of differences between conditions may have led participants to speculate about their allocation to treatment conditions and consequently impacted their expectations for treatment outcomes. Despite this methodological weakness, the control participants benefited equally from the logging condition which suggests that the inability to blind participants to condition differences after randomization did not impact some of the treatment outcomes.

The potential influence of demand characteristics must also be considered when interpreting the results of this study. Although the recruitment procedures did not

explicitly define the focus of the study on negative body image, the content of the intervention would have made this very clear to intervention participants. Additionally, both the intervention and control participants would be privy to the focus on body image content during completion of study questionnaires at baseline and at the end of the intervention. As a result, participants in the intervention condition may have responded more favorably as a result of knowing the target of the intervention. This, in turn, may serve as a threat to the validity of the results. Methodological elements could be implemented in future research to minimize this vulnerability including masking questionnaire content or implementing objective measures of body image. This continues to be a challenge in psychological research as blinding participants in order to reduce demand characteristics can be challenging but efforts to address risk in this form are warranted to improve the integrity of the findings.

The length of the current study may have limited the ability to detect changes in outcome variables. It has been a relatively robust finding that maximal weight loss is accomplished following 6-months of weight management (Wing, 2002). While the length of the current study was four weeks in order to adhere to the manualized Body Project intervention protocol, the brief nature of the program may have limited the degree to which eating and exercise behavior changes that facilitate weight loss would realistically be observed.

Participants often reported that the diet and physical activity logging was burdensome. Although data suggest that paper and pencil logs (such as those used in this study) are as efficacious as other forms that are available (Burke, Conroy, et al., 2011*),*

the amount of time and effort required for regular tracking may have impacted participants' willingness to log on a regular basis. Additionally, many participants indicated that they used a mobile device application for tracking and then copied the information to their paper logs. Similarly, many individuals reported difficulty with the pedometers becoming detached. Some individuals resorted to using their own step-counting device (e.g., FitBit). Differences across participants in access to and familiarity with such devices may have led to systematic differences in tracking behavior for both diet and physical activity.

Attrition in the current sample was consistent with expected rates. Approximately 20% of the sample dropped out of the study before completing the time 2 assessment. Importantly, rates did not differ across conditions. While the rate of attrition was comparable to that typically observed in weight management trials, it remains a concern for interpreting the results of the study. At a minimum, dropout contributed to reduced statistical power for assessing treatment outcomes. Additionally, attrition inevitably alters the nature of the group as those who complete the study may differ from non-completers in important ways. In the current study the individuals who dropped out reported poorer physical quality of life ($F(1, 42)=4.60$, $p=.04$) at the start of the study compared with those who completed the study, but did not differ on age, BMI, or any other study variables at baseline.

Implications and future directions

The current study contributes to the growing literature documenting deleterious health effects of body dissatisfaction, highlighting the need to consider the public health

consequences of negative body image. There is a clear need to better understand body image among diverse samples including adult women and specifically those who would benefit from weight loss. The results of the current study indicate that targeting body image may be appropriate and relevant among overweight and obese individuals to reduce eating and exercise tendencies that disrupt health behavior changes, contribute to poorer quality of life, and prevent successful weight loss. Body dissatisfaction has been robustly linked to dysregulated eating and exercise behaviors. It also has been associated with impaired quality of life among other age (i.e., adolescent females) and weight groups (i.e., normal weight). The findings of this study contribute additional evidence documenting similar relationships among adult women, and among those attempting weight loss.

The wealth of literature exploring body image among young females provided an excellent launching point for this research. However, the data suggest that there is a need for a more developmentally sensitive understanding of body image. Recent research suggests that factors influencing body image may vary across the lifespan. For example, Jankowski and colleagues (2016) identified the relevance of health, youthfulness, and aging gracefully as common concerns influencing body image among older adults. It will be important to develop and validate measures that incorporate elements of body image relevant for various weight and age groups that might currently be missing from the larger understanding of the construct. In doing so, investigators will be better able to study body image in this population and to intervene effectively. Results of the current study (e.g., no change observed in thin ideal despite significant improvements in body

dissatisfaction) suggest that the model utilized by Stice and his colleagues to develop the Body Project intervention may not be appropriate for adult women attempting weight loss. Identifying the thoughts and feelings that overweight and obese women have about their bodies, and determining how negative body image impacts weight loss, will help to better address concerns in this population. It may be possible to modify the Body Project intervention to address the needs of this population or develop a novel intervention altogether.

The body image literature also has been limited by an emphasis on pathology-oriented measures and interventions. Understanding body image as it relates to obesity and weight loss will benefit from exploration of both positive and negative facets of the multi-dimensional body image construct. As it is becoming increasingly evident that body dissatisfaction is an understudied factor among adult women attempting weight loss, there is a need for research exploring body image more broadly among this population. This study was the first to measure body appreciation among women attempting weight loss and to observe improvements in this construct in the context of a weight loss intervention. The cross-sectional moderation analyses suggest that body appreciation may serve a protective function. Thus, in some circumstances body appreciation may be more relevant than body dissatisfaction (e.g., for exercise self-efficacy in the current study).

This was the first implementation of the Body Project intervention among adult women and among individuals seeking weight management treatment. Thus, this study provided feasibility data, evaluating the degree to which this intervention could be

implemented with this novel population and the degree to which the treatment effects from efficacy, effectiveness, and dissemination research could be replicated. The results suggest that this manualized treatment can be translated for use among adult women attempting weight loss with relative ease. The manual required minimal revision to assure appropriateness, and participant feedback was largely positive in regard to the content and the structure of the intervention. Fidelity data revealed a high level of adherence to the treatment manual in the delivery of the intervention across sessions and across cohorts. Further, attendance at group sessions was very good. Accordingly, positive feasibility outcomes were observed for the Body Project intervention in the context of appropriateness, demand, and practicality.

The replication of treatment effects in this novel sample is less clear. The results in the full sample suggest that, despite positive feedback from participants, the intervention provided no additional benefit in improving body image, quality of life, health behavior, or weight loss compared with self-monitoring of diet and physical activity. Because the control group experienced changes in the treatment variables, it would be worthwhile to administer this intervention with a different control condition (or with an additional control condition), perhaps controlling for time and social contact but eliminating the weight loss recommendations utilized in the current study. For methodological rigor, it would be best to recruit a larger sample and randomize subjects to one of three conditions: (1) a control condition accounting for time and social factors, 2) the Body Project intervention, and 3) the Body Project Intervention + weight management recommendations. The practicality of implementing an intervention with known effects is

ideal, particularly as interventions for body image among adult women are limited in number. However, results of this study suggest that a different model of body image and health behavior might be relevant in this population, perhaps requiring a revision to the current model or a new model altogether. To develop or revise the model it will be important to 1) identify the most potent risk factors for body image disturbances and 2) determine the facets of weight-related health behaviors and quality of life that are most closely associated with body image. A better understanding of body image in overweight and obese adult women attempting weight loss will help determine the degree to which modifications should be made to the Body Project intervention. It may also reveal that alternative intervention strategies should be explored.

Failure to capture the target population as a result of the screening tools utilized is particularly relevant for future research with this population. It may be beneficial to use the Body Shape Questionnaire as a screening tool in addition to using it for monitoring treatment effects (much like the Beck Depression Inventory (BDI) would be used to both screen for depression treatment and to measure treatment progress/outcomes). Additionally, it is important to consider that not all participants presenting for treatment endorsed body dissatisfaction. In fact, individuals were screened out of the study for failing to endorse body image disturbances and approximately 25% of enrolled participants did not endorse body dissatisfaction at baseline. This suggests that the body image intervention may not be useful or appropriate for all individuals seeking weight management treatment. These findings underscore the growing need to incorporate treatment matching as a strategy within weight management research and treatment.

Specifically, specialized treatment plans developed to address unique risk factors for poor treatment outcome may be warranted as opposed to a one-size-fits-all model of weight management. Although targeting unique risk factors for poor treatment outcome is commonplace in weight management research, screening is infrequently utilized to identify individuals most likely to benefit. Combining the use of screening for body dissatisfaction with efficacious interventions for body image disturbances may help reduce the proportion of individuals who do not achieve weight loss success.

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Appendix A: Tables

Table 1

Demographic information for total sample

Variables	M ± SD
Age	37.9 ± 7.7
Body Mass Index (BMI)	30.5 ± 2.9
BMI group	
% Overweight	48
% Obese	52
Waist Circumference (cm)	98.9 ± 8.7
Race	
% White	71%
% Black, AA	18
% Hispanic	2
% Asian	5
% American Indian	2
% Other	2
Education (years)	16.5 ± 2.3
Currently employed (%)	75
Marital Status	
%Single	34
%Married	50
%Divorced/separated	16
Have Children (%)	61

Table 2

Relationship between study variables and age, BMI, and education in total sample

Variables	Age	BMI	Education
Body dissatisfaction	-0.10	-0.29†	-0.06
Body appreciation	-0.05	0.17	0.32*
Internalization of thin ideal	-0.20	-0.32*	0.08
Emotional eating	-0.08	-0.19	0.06
Eating self-efficacy	-0.13	-0.13	-0.09
Exercise self-efficacy	0.01	-0.29*	-0.03
Perceived stigma	-0.12	-0.10	-0.22
Negative affect	0.01	-0.06	-0.23
Weight-related quality of life	0.05	-0.03	-0.28†
Mental quality of life	0.05	0.41*	-0.09
Physical quality of life	-0.05	-0.39*	0.25†

Note: *p<.05; †p<.10

Table 3

Analysis of variance evaluating differences in age, BMI, and study variables by race

Variables	F	p
Age	0.90	0.49
BMI	0.83	0.53
Body dissatisfaction	1.47	0.22
Body appreciation	1.33	0.27
Internalization of thin ideal	0.93	0.47
Emotional eating	0.57	0.72
Eating self-efficacy	0.50	0.77
Exercise self-efficacy	0.71	0.62
Perceived stigma	1.99	0.10
Negative affect	0.50	0.78
Weight-related quality of life	2.03	0.10
Mental quality of life	1.34	0.27
Physical quality of life	0.25	0.94

Table 4

Pearson correlation analyses evaluating relationship between all psychosocial study variables among total sample at baseline

	1	2	3	4	5	6	7	8	9	10
1. BSQ	-									
2. BAS	-.66*	-								
3.SATAQ-4	.42**	-.34*	-							
4. ESES	.38**	-.35*	.37*	-						
5. EES	.43**	-.37*	.39*	.80**	-					
6. SES-E	-.18	.45**	-.04	-.29*	-.16	-				
7.IWQOL	.63**	-.62**	.25	.39*	.32*	-.29*	-			
8. MCS	-.56**	.51**	-.17	-.14	-.22	.30*	-.23	-		
9. PCS	.15	-.00	.23	-.23	.16	.23	-.40*	-.27†	-	
10. NA	.53**	-.60**	.17	.15	.15	-.33*	.52**	-.45**	-.11	-
11. SIS	.50**	-.59**	.15	.18	.17	-.33*	.63**	-.47**	-.14	0.52**

Note: *p < .05, **p< .01, †<.10, BSQ=Body Shape Questionnaire, BAS=Body Appreciation Scale, SATAQ-4=Thin ideal subscale of SATAQ-4, ESES=Eating self-efficacy, EES=Emotional eating, SES-E=Self-efficacy for exercise, IWQOL=Weight-related quality of life, MCS=Mental quality of life, PCS=Physical quality of life, NA=Negative affect, SIS=Perceived stigma

Table 5

Regression models evaluating the moderating effect of perceived stigma and body appreciation on the cross-sectional relationships between body dissatisfaction and health behaviors and quality of life

Variable	Parameter estimate	t-value	p
Emotional Eating			
Body Shape Questionnaire	0.97	2.87	0.01
Perceived Stigma	2.29	1.87	0.07
BSQ x Perceived Stigma	-0.02	-2.02	0.05
Body Shape Questionnaire	-0.37	-0.90	0.37
Body Appreciation Scale	-23.51	-1.72	0.09
BSQ x Body Appreciation	0.18	1.52	0.14
Eating Self-efficacy			
Body Shape Questionnaire	1.05	2.22	0.03
Perceived Stigma	2.54	1.47	0.15
BSQ x Perceived Stigma	-0.02	-1.54	0.13
Body Shape Questionnaire	-0.51	-0.90	0.37
Body Appreciation Scale	-30.83	-1.63	0.11
BSQ x Body Appreciation	0.23	1.40	0.17
Negative Affect			
Body Shape Questionnaire	-0.13	-2.62	0.01
Perceived Stigma	-0.56	-3.00	0.005
BSQ x Perceived Stigma	0.01	3.74	<.001
Body Shape Questionnaire	0.29	5.05	<.001
Body Appreciation Scale	6.20	3.29	0.002
BSQ x Body Appreciation	-0.08	-4.71	<.001

Continued

Table 5 continued

Variable	Parameter estimate	t-value	P
Weight-Related Quality of Life			
Body Shape Questionnaire	-0.20	-0.98	0.33
Perceived Stigma	-1.00	-1.31	0.20
BSQ x Perceived Stigma	0.01	2.22	0.03
Body Shape Questionnaire	0.98	3.85	<.001
Body Appreciation Scale	17.41	2.06	0.05
BSQ x Body Appreciation	-0.23	-3.14	0.003
Mental Quality of Life (SF-36)			
BMI	1.07	2.22	0.03
Body Shape Questionnaire	-0.16	-0.95	0.35
Perceived Stigma	-0.39	-0.65	0.52
BSQ x Perceived Stigma	0.00	0.21	0.84
BMI	1.09	2.25	0.03
Body Shape Questionnaire	-0.19	-0.99	0.33
Body Appreciation Scale	0.90	0.14	0.89
BSQ x Body Appreciation	0.03	0.46	0.64

Note: BMI=Body Mass Index, BSQ=Body Shape Questionnaire

Table 6.

Comparison of demographic variables and attrition among intervention versus control participants at baseline

	Control (n=21)	Intervention (n=23)
Age	39.5 (7.8)	36.4 (7.3)
BMI	31.0 (2.7)	30.1 (3.2)
Race	62% white	78% white
	24% black/AA	13% black/AA
	14% other	9% other
BMI class	33% overweight	61% overweight
	67% obese	39% obese
Attrition	19%	22%
Education (years)	16.1 (2.1)	16.7 (2.4)

Note: BMI = Body Mass Index, AA=African American, Overweight: 25≤BMI<30; Obese: 30≤BMI

Table 7

Mean values for outcome variables at baseline and time 2 assessments among intervention and control participants

Variable	Control (n=21)		Intervention (n=23)		
	Baseline	Time 2	Baseline	Time 2	Partial η^2
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
Body Mass Index	31.0 (2.65)	30.7 (2.71)	30.1 (3.19)	29.9 (2.97) [a]	.02
Body dissatisfaction	101.0 (32.84)	89.8 (30.54)	107.3 (27.86)	94.6 (30.79)[a]	.004
Body appreciation	3.2 (0.87)	3.4 (0.89)	3.1 (0.75)	3.3 (0.85)[a] [b]	.12
Internalization of thin ideal	3.1 (0.92)	3.2 (0.98)	3.1 (0.97)	2.93 (0.89)	.74
Emotional eating	28.4 (20.78)	29.1 (21.96)	33.4 (20.60)	32.3 (17.90)	.97
Eating self-efficacy	91.2 (30.18)	91.2 (33.20)	94.0 (24.60)	96.9 (24.14)	.45
Exercise self-efficacy	66.1 (16.86)	61.8 (20.61)	67.1 (20.37)	61.2 (19.72) [a] [b]	.24
Negative affect	12.9 (3.94)	13.6 (4.61)	13.17 (4.00)	14.8 (4.53)	.13
Weight-related quality of life	58.9 (15.99)	51.6 (14.77)	64.2 (17.68)	60.5 (19.96) [a]	.10
Mental quality of life	39.3 (11.26)	43.6 (12.60)	40.4 (11.14)	43.5 (9.95) [a]	.08
Physical quality of life	52.7 (9.79)	52.1 (8.85)	53.1 (8.80)	53.4 (6.77) [c]	.10
Perceived Stigma	38.01 (11.99)	35.7 (12.76)	36.52 (10.50)	36.9 (9.922)	.66

Note: Intent-to-treat approach was utilized with last observation carried forward for missing data at the time 2 assessment, Effect size estimates reflect partial eta squared for the group by time interaction, [a]indicates significant time main effect; [b] time main effect no longer significant when controlling for demographic covariate; [c] time main effect becomes significant when controlling for demographic covariate

Table 8

Adherence to self-monitoring of dietary intake and physical activity among intervention versus control participants

	Control (n=17)	Intervention (n=18)
Diet log (%)	0.86 (0.24)	0.87 (0.25)
Caloric limit (%)	0.35 (0.29)	0.45 (0.29)
Daily Fruit intake (Mean, SD)	0.76 (0.43)	1.00 (0.66)
Daily Vegetable intake (Mean, SD)	2.04 (1.52)	2.45 (1.74)
PA log (%)	0.76 (0.31)	0.86 (0.24)
Step goal (%)	0.26 (0.24)	0.32 (0.25)
Daily step count (Mean, SD)	5637 (2850)	6836 (2402)

Note: Diet logs: proportion of logs submitted divided by total days of possible tracking; Caloric limit: number of days participant reported staying within calorie limit divided by total days of possible tracking; Daily Fruit intake: average number of different types of fruits consumed; Daily Vegetable intake: average number of different types of vegetables consumed; PA logs: number of physical activity logs submitted divided by total days of possible tracking; Step goal: number of days participant reported achieving step goal of 10,000 steps divided by total day of possible tracking; Daily step count: average number of steps logged

Table 9

Level of body dissatisfaction in current sample compared with university undergraduates and staff, body image therapy patients, and obese dieters

	Current sample (n=44)	University Undergraduates (n=163)*	University Staff (n=89)*	Body Image Therapy Patients (n=155)*	Obese dieters (n=59)*
Age	37.9 (7.65)	18.5 (1.9)[a]	41.4 (10.0)[a]	35.6 (11.4)	41.7 (11.0)[a]
BMI	30.5 (2.94)	21.7 (2.7)[a]	24.1 (4.7)[a]	27.9 (6.9)[a]	33.5 (4.6)[a]
Body Dissatisfaction	104.3 (30.15)	96.3 (32.8)	75.8 (28.4)[a]	129.9 (29.0)[a]	123.1 (27.9)[a]

Note: * Data retrieved from Rosen et al., 1985, [a] significant difference between current study sample

Table 10

Qualitative feedback from participants of the Body Project Intervention

	Mean	(SD)	Range
Helpful	3.83	(0.99)	2-5
Uncomfortable	2.44	(1.99)	1-4
Relevant	3.94	(0.94)	2-5
Unproductive	2.11	(1.13)	1-4
Worthwhile	3.83	(1.04)	2-5
Difficult	2.67	(1.19)	1-5
Organized	4.59	(0.62)	3-5
Thought-provoking	4.67	(0.49)	4-5
Awkward	2.56	(1.10)	1-4
Supportive	4.56	(0.62)	3-5
Unnecessary	2.28	(1.18)	1-5
Challenging	3.39	(1.24)	1-5

Note: Participants were asked to rate their experience by indicating the degree to which each adjective described their feelings about the body image group sessions. Rating was completed on a 1 (Strongly Disagree) to 5 (Strongly Agree) Likert scale

Table 11

Samples of positive and negative feedback from open-ended section of qualitative feedback provided by intervention participants

12a "The group made me feel good! It was my one time each week that was focused solely on me and my health. I loved hearing what the other women had to share. It feel good to know that other women struggled in the same way as I did. I love the content of the class. I was inspired to begin taking vitamins, buy some new clothes that fit and think differently about myself. I wouldn't have guessed that a group that had no content on calorie counting, nutrition, exercise could have been so beneficial. In general, it has made me feel better about myself. Mostly, it's given me hope that I can feel better in my own skin and closer to my ideal healthy body."
12b "I was expecting the group to be about diet and exercise- more about what and when to eat. I was surprised to find it was about body image. I found the assignments to be thought provoking, difficult, uncomfortable, and challenging, but definitely helpful in the end. The body image group helped me see that others struggled with the same issues as I do. The group was supportive and well organized. I feel confident that I will be able to be more aware of my thoughts, and also of others' negative comments. I am prepared to rebuke the negative with the positive! Thank you for your kindness during this process."
12c "I wish I attended all 4 sessions. It was interesting to hear everyone's opinions and how different they were. I wasn't enthusiastic about all of the assignments - esp writing the letters. Mostly because I do not like to write a whole lot. Overall, the group was very diverse and I think it was helpful to have conversations we don't normally have with other women and in a safe environment."
12d "I think the group has opened my eyes into taking a different approach in changing how I feel about myself."
12e "I felt like there was a bit of a disconnect between the group classes and the rest of the study. I am overweight and need to lose weight to improve my health now and for the future. I felt bad after each group that I was focused on trying to lose weight. I could care less really about how I look, but really want to lose weight to be in a healthy weight range. I am 45 years old and really pretty comfortable c myself and how I present myself to the world. My main concern is my health and being able to remain

Continued

Table 11 continued

physically fit and active for a long time to come, as well as to prevent chronic illnesses like heart disease and diabetes from developing. I was excited about the classes initially as I thought we would be learning about nutrition and gain strategies for weight loss. Instead the focus on positive body image left me feeling underwhelmed and actually even more focused on my body instead of less focused. The topic definitely dampered my enthusiasm for the study. On a positive note, I loved the ladies in the group. They are stellar women who all were beautiful inside and out! I am so glad to have met them and been influenced by their point of view."
12f "Some of the exercises actually made me feel worse about myself (the mirror exercise especially). It is very difficult to turn around decades of negative thinking in 4 weeks. However, it was enlightening to see that other women had some of the exact same thoughts as me and I did feel supported by the group."
12g "I honestly feel worse about myself after being in the group. I realized that I am a lot more negative than most women and seemed to be the only one who experienced negativity in social situations. This made me feel even more like it was my fault. I do think the exercises were sort of juvenile but I plan on trying to do more to get myself out of this funk I think I am in now. All in all - I would recommend this group to other women since I can see the benefit, I must be an anomaly."
12h "I feel that the group may be helpful for some individuals, just not for me. I really do not enjoy doing assignments. I personally am very comfortable with my body and talking about it and my feelings so I did not find it to be challenging or uncomfortable."

Table 12

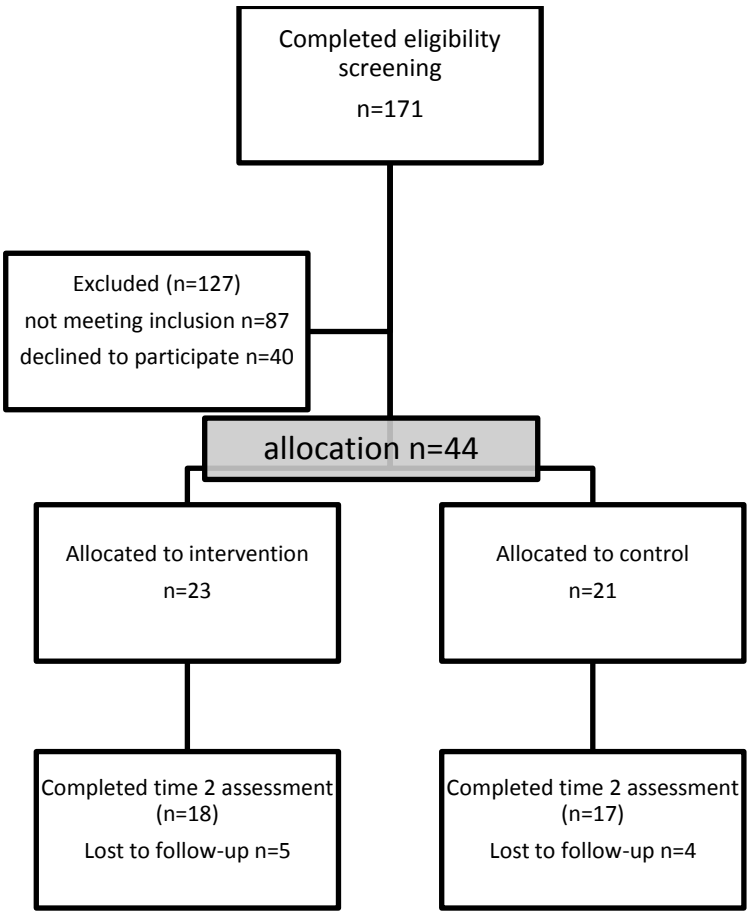
Mean BMI and body image variables at Baseline and Time 2 among participants who endorsed body dissatisfaction at baseline

	Control (n=13)		Intervention (n=13)		Partial eta^2
	Baseline (mean, SD)	Time 2 (mean, SD)	Baseline (Mean, SD)	Time 2 (mean, SD)	
Body dissatisfaction	120.5(25.68)	104.2(30.04)**	114.0 (19.92)	88.3(27.59) **	.95
Body appreciation	2.8(0.72)	2.9(0.68)†	3.0(0.67)	3.4(0.84) **	.22
Internalization of thin ideal	3.6(0.46)	3.7(0.83)	3.1(1.05)	2.7(0.80)*	.79
BMI	30.7(2.90)	30.4(2.90)	29.4(3.09)	29.1(2.83) *	.02

Note: Analyses conducted among individuals who reported body dissatisfaction (BSQ≥80) and among intervention participants who received all intervention material. Partial eta squared reflects effect size for group by time interaction. The following symbols indicate change from baseline within the group: †p<.10, *p<.05, **p<.01, BMI=Body mass index

Appendix B: Figures

Figure 1. CONSORT Flow Diagram of participant progress through study phases



Appendix C: Study Questionnaires

Participant Information Form

ID#_____ Date:

_____

Please circle one response for each of the questions below:

1. **What is your age? _____**

2. **What is your date of birth? _____**

3. **With which ethnic/racial group do you primarily identify?**
    a. Black
    b. White
    c. Hispanic
    d. Asian
    e. American Indian
    f. Other (please list) _____

4. **What is your gender?**
    a. Male
    b. Female
    c. Other (please list) _____

5. **What is your marital status?**
    a. Single, never married
    b. Married
    c. Divorced / separated
    d. Widowed

6. **What are your living arrangements?**
    a. Living alone
    b. Living with spouse or "significant other"
    c. Living with children
    d. Living with children and spouse or significant other
    e. Living with parent
    f. Living with friend(s)

7. **List the relationships and age of current members of your household.**
    a. Relationship_____ age_____
    b. Relationship_____ age_____
    c. Relationship_____ age_____
    d. Relationship_____ age_____
    e. Relationship_____ age_____
    f. Relationship_____ age_____
8. **What is your current work status?**
    a. Employed full-time
    b. Employed part-time
    c. Unemployed, on disability
    d. Unemployed, looking for a job
    e. Unemployed, not looking for a job
    f. Retired
    g. Homemaker, not employed outside the home
    h. Other:_____
9. **Which of the following professional areas best describes your primary occupation or former occupation?**
    a. Higher executives, major professionals, owners of large businesses (less than 1000 employees)
    b. Managers of medium sized businesses (less than 500 employees), nurses, opticians, pharmacists, social workers, teachers
    c. Administrative personnel, managers, minor professionals, owners/proprietors of small businesses (less than 250 employees): bakery, car dealership, engraving business, plumbing business, florist, decorator, actor, reporter, travel agent
    d. Clerical and sales, technicians, bank teller, bookkeeper, clerk, draftsperson, timekeeper, secretary
    e. Skilled manual - usually having had training (baker, barber, brakeperson, chef, electrician, fireperson, lineperson, machinist, mechanic, paperhanger, painter, repairperson, tailor, welder, policeperson, plumber)
    f. Semi-skilled (hospital aide, painter, bartender, bus driver, cutter, cook, drill press, garage guard, checker, waiter, spot welder, machine operator)
    g. Unskilled (attendant, janitor, construction helper, unspecified labor, porter).
    h. Homemaker.
    i. Student, disabled, no occupation.

10. How much education have you received

a. Less than 9 grades
   Through what grade did you complete? _____
b. Some high school
   Through what grade did you complete? _____
c. Graduated from high school/GED
d. Trade school
e. Some college (including completion of junior college)
   How many years did you complete? _____
f. Graduated from a 4-year college
g. Post-graduate work at a University
   How many years did you complete? _____

11. What is the highest degree you earned?

a. High school diploma or equivalency (GED)
b. Trade school
c. Associate degree
d. Bachelor's degree
e. Master's degree
f. Law Degree (JD)
g. Professional degree or doctorate (PhD, MD, DDS)
h. Other _____
i. None of the above (less than high school)

12. Which of these categories best describes your total combined family income for the past 12 months? This should include income (before taxes) from all sources, wages, rent from properties, social security, disability and/or veteran's benefits, unemployment benefits, workman's compensation, help from relatives (including child payments and alimony), and so on.

☐ Less than $5,000
☐ $5,000 through $11,999
☐ $12,000 through $15,999
☐ $16,000 through $24,999
☐ $25,000 through $34,999
☐ $35,000 through $49,999
☐ $50,000 through $74,999
☐ $75,000 through $99,999
☐ $100,000 and greater
☐ Unknown
☐ No response

13. What health problem(s) have you ever had? (Please check all that apply)

Condition	Yes, currently	Yes, but not currently	No, never
Stroke / TIA	☐	☐	☐
Heart Attack	☐	☐	☐
Angina (cardiac chest pain)	☐	☐	☐
Heart Failure	☐	☐	☐
Heart Valve disease	☐	☐	☐
Other Heart Disease	☐	☐	☐
Peripheral vascular disease	☐	☐	☐
Diabetes	☐	☐	☐
High Cholesterol	☐	☐	☐
Hypertension (high blood pressure)	☐	☐	☐
Kidney Disease	☐	☐	☐
Cancer	☐	☐	☐
Arthritis	☐	☐	☐
Chronic Obstructive Pulmonary Disease	☐	☐	☐
Lung Disease (other than COPD)	☐	☐	☐
Osteoporosis	☐	☐	☐
Depression	☐	☐	☐
Condition	**Yes, currently**	**Yes, but not currently**	**No, never**
Sleep Apnea	☐	☐	☐
Asthma	☐	☐	☐
Liver disease	☐	☐	☐
Ulcer disease	☐	☐	☐
Joint or muscle pain	☐	☐	☐
Brain/nervous system problems	☐	☐	☐
Digestive problems	☐	☐	☐
Eye disease	☐	☐	☐
Hormonal imbalance	☐	☐	☐
Thyroid disease	☐	☐	☐
Sleep disorders (not sleep apnea)	☐	☐	☐
Chronic headaches	☐	☐	☐
Skin irritation	☐	☐	☐
Blood disorders	☐	☐	☐
Muscular Disorder (MS, post-polio)	☐	☐	☐

14. Please list all prescription and over-the-counter medications (include vitamin and mineral supplements) that you currently take.

	Medication/supplement name	Dosage
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

15. Have you ever had any surgeries?

a. YES
b. NO

If YES,

Date	Surgery

16. Have you had children? (Circle one.) YES NO

If YES,

a. List the date of birth for each child

Child #1:_____

Child #2: _____

Child #3: _____

Child #4: _____

Child #5: _____

17. Circle the letter of the statement that best describes you. "During the past 6 months my weight has…"

a. Decreased more than 10lbs or more
b. Decreased by 5-10 lbs.
c. Been relatively stable
d. Increased by 5 to 10lbs.
e. Increased by more than 10lbs. or more.
f. I am not sure

18. What was your approximate weight:

6 months ago? _____ lbs. **1year ago?** _____ lbs. **2 years ago?** _____ lbs

19. Are you currently trying to lose weight? (Circle one.) YES NO

If YES,

a. How long have you been trying to lose weight?_____-
_____

b. Please describe any changes you've made to your dietary intake to lose weight (e.g. portion size, types of foods, etc .)
_____
_____
_____
_____
_____
_____

c. Please describe any changes you've made to your activity level to lose weight (e.g. exercise, parking car farther away, etc.)
_____
_____
_____

_____

_____

_____

20. Are you following a weight loss plan? (Circle one.) YES NO

If YES, what is the name of the weight loss plan(s)? (e.g. Slimfast, Nutrisystem, Atkins Diet, etc.)

_____

_____

_____

_____

_____

21. Are you tracking your food intake? (Circle one.) YES NO

If yes, please describe the method of tracking.

_____

_____

_____

_____

_____

22. Are you tracking your physical activity or daily steps? (Circle one.) YES NO

If yes, please describe the method of tracking.

_____

_____

_____

_____

_____

23. Do you weigh yourself? (Circle one.) YES NO

If yes, please describe where (e.g., bathroom scale, gym) and how frequently.

_____

_____

_____

_____

_____

BSQ

We should like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS:

	Never	Rarely	Sometimes	Often	Very Often	Always
1.Has feeling bored made you brood about your shape?	1	2	3	4	5	6
2.Have you been so worried about your shape that you have been feeling that you ought to diet?	1	2	3	4	5	6
3.Have you thought that your thighs, hips or bottom are too large for the rest of you?	1	2	3	4	5	6
4.Have you been afraid that you might become fat (or fatter)?	1	2	3	4	5	6
5.Have you worried about your flesh not being firm enough?	1	2	3	4	5	6
6.Has feeling full (e.g., after eating a large meal) made you feel fat?	1	2	3	4	5	6
7.Have you felt so bad about your shape that you have cried?	1	2	3	4	5	6
8.Have you avoided running because your flesh might wobble?	1	2	3	4	5	6
9.Has being with thin women made you feel self-conscious about your shape?	1	2	3	4	5	6

10.Have you worried about your thighs spreading out when sitting down?	1	2	3	4	5	6
11.Has eating even a small amount of food made you feel fat?	1	2	3	4	5	6
12.Have you noticed the shape of other women and felt that your own shape compared unfavourably?	1	2	3	4	5	6
13.Has thinking about your shape interfered with your ability to concentrate (e.g., while watching television, reading, listening to conversations)?	1	2	3	4	5	6
14.Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6
15.Have you avoided wearing clothes which make you particularly aware of the shape of your body?	1	2	3	4	5	6
16.Have you imagined cutting off fleshy areas of your body?	1	2	3	4	5	6
17.Has eating sweets, cakes, or other high calorie foods made you feel fat?	1	2	3	4	5	6
18.Have you not gone to social occasions (e.g., parties) because you have felt bad about your shape?	1	2	3	4	5	6

19.Have you felt excessively large and rounded?	1	2	3	4	5	6
20.Have you felt ashamed of your body?	1	2	3	4	5	6
21.Has worry about your shape made you diet?	1	2	3	4	5	6
22.Have you felt happiest about your shape when your stomach has been empty (e.g., in the morning)?	1	2	3	4	5	6
23.Have you thought that you are the shape you are because you lack self-control?	1	2	3	4	5	6
24.Have you worried about other people seeing rolls of flesh around your waist or stomach?	1	2	3	4	5	6
25.Have you felt that it is not fair that other women are thinner than you?	1	2	3	4	5	6
26.Have you vomited in order to feel thinner?	1	2	3	4	5	6
27.When in company have you worried about taking up too much room (e.g., sitting on a sofa or a bus seat?)	1	2	3	4	5	6
28.Have you worried about your flesh being dimply?	1	2	3	4	5	6
29.Has seeing your reflection (e.g., in a mirror or a shop window) made you	1	2	3	4	5	6

feel bad about your shape?						
30.Have you pinched areas of your body to see how much fat there is?	1	2	3	4	5	6
31. Have you avoided situations where people could see your body (e.g., communal changing rooms or swimming baths)?	1	2	3	4	5	6
32.Have you taken laxatives in order to feel thinner?	1	2	3	4	5	6
33.Have you been particularly self-conscious about your shape when in the company of other people?	1	2	3	4	5	6
34.Has worry about your shape made you feel you ought to exercise?	1	2	3	4	5	6

BAS

	Question	Always	Often	Sometimes	Seldom	Never
1	I respect my body	5	4	3	2	1
2	I feel good about my body	5	4	3	2	1
3	On the whole, I am satisfied with my body	5	4	3	2	1
4	Despite its flaws, I accept my body for what it is	5	4	3	2	1
5	I feel that my body has at least some good qualities	5	4	3	2	1
6	I take a positive attitude toward my body	5	4	3	2	1
7	I am attentive to my body's needs	5	4	3	2	1
8	My self-worth is independent of my body shape or weight	5	4	3	2	1
9	I do not focus a lot of energy being concerned with my body shape or weight	5	4	3	2	1
10	My feelings toward my body are positive, for the most part	5	4	3	2	1
11	I engage in healthy behaviors to take care of my body	5	4	3	2	1
12	I do not allow unrealistically thin images of women presented in the media to affect my attitudes toward my body	5	4	3	2	1
13	Despite its imperfections, I still like my body	5	4	3	2	1

SATAQ – 4

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

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

	Definitely Disagree				**Definitely Agree**
1. It is important for me to look athletic.	1	2	3	4	5
2. I think a lot about looking muscular.	1	2	3	4	5
3. I want my body to look very thin.	1	2	3	4	5
4. I want my body to look like it has little fat.	1	2	3	4	5
5. I think a lot about looking thin.	1	2	3	4	5
6. I spend a lot of time doing things to look more athletic.	1	2	3	4	5
7. I think a lot about looking athletic.	1	2	3	4	5
8. I want my body to look very lean.	1	2	3	4	5
9. I think a lot about having very little body fat.	1	2	3	4	5
10. I spend a lot of time doing things to look more muscular.	1	2	3	4	5

Answer the following questions with relevance to your Family (include: parents, brothers, sisters, relatives):

11. I feel pressure from family members to look thinner.	1	2	3	4	5
12. I feel pressure from family members to improve my appearance.	1	2	3	4	5

	Definitely Disagree				Definitely Agree
13. Family members encourage me to decrease my level of body fat.	1	2	3	4	5
14. Family members encourage me to get in better shape.	1	2	3	4	5

Answer the following questions with relevance to your Peers (include: close friends, classmates, other social contacts):

15. My peers encourage me to get thinner.	1	2	3	4	5
16. I feel pressure from my peers to improve my appearance.	1	2	3	4	5
17. I feel pressure from my peers to look in better shape.	1	2	3	4	5
18. I get pressure from my peers to decrease my level of body fat.	1	2	3	4	5

Answer the following questions with relevance to the Media (include: television, magazines, the Internet, movies, billboards, and advertisements):

19. I feel pressure from the media to look in better shape.	1	2	3	4	5
20. I feel pressure from the media to look thinner.	1	2	3	4	5
21. I feel pressure from the media to improve my appearance.	1	2	3	4	5
22. I feel pressure from the media to decrease my level of body fat.	1	2	3	4	5

Eating Self Efficacy Scale (ESES)

For numbers 1-25 you should rate the likelihood that you would have difficulty controlling your overeating in each of the situations listed on the next pages, using this scale:

1	2	3	4	5	6	7
No difficulty controlling eating			Moderate difficulty controlling eating			Most difficulty controlling eating

For example, if you thought you had great difficulty controlling your eating when you are at parties, you might complete an item specifying parties in this way:

Overeating at parties

1	2	3	4	5	(6)	7

Please complete every item.

How difficult is it to control your…

1. Overeating after work or school

1	2	3	4	5	6	7

2. Overeating when you feel restless

1	2	3	4	5	6	7

3. Overeating around holiday time

1	2	3	4	5	6	7

4. Overeating when you feel upset

1	2	3	4	5	6	7

5. Overeating when you feel tense

1	2	3	4	5	6	7

6. Overeating with friends

1	2	3	4	5	6	7

7. Overeating when preparing food

1	2	3	4	5	6	7

8. Overeating when irritable

1	2	3	4	5	6	7

9. Overeating as part of a social occasion dealing with food – like a restaurant or dinner party

1	2	3	4	5	6	7

10. Overeating with family members

1	2	3	4	5	6	7

1	2	3	4	5	6	7
No difficulty controlling eating			Moderate difficulty controlling eating			Most difficulty controlling eating

11. Overeating when annoyed

1	2	3	4	5	6	7

12. Overeating when angry

1	2	3	4	5	6	7

13. Overeating when you are angry at yourself

1	2	3	4	5	6	7

14. Overeating when depressed

1	2	3	4	5	6	7

15. Overeating when you feel impatient

1	2	3	4	5	6	7

16. Overeating when you want to sit back and enjoy some food

1	2	3	4	5	6	7

17. Overeating after an argument

1	2	3	4	5	6	7

18. Overeating when you feel frustrated

1	2	3	4	5	6	7

19. Overeating when tempting food is in front of you

1	2	3	4	5	6	7

20. Overeating when you want to cheer up

1	2	3	4	5	6	7

21. Overeating when there is a lot of food available to you (refrigerator is full)

1	2	3	4	5	6	7

22. Overeating when you feel overly sensitive

1	2	3	4	5	6	7

23. Overeating when nervous

1	2	3	4	5	6	7

1	2	3	4	5	6	7
No difficulty controlling eating			Moderate difficulty controlling eating			Most difficulty controlling eating

24. Overeating when hungry

1	2	3	4	5	6	7

25. Overeating when anxious or worried

1	2	3	4	5	6	7

Emotional Eating Scale

We all respond to different emotions in different ways. Some types of feelings lead people to experience an urge to eat. Please indicate the extent to which the following feelings lead you to feel an urge to eat by placing a check mark on the appropriate line.

	No Desire to Eat	A Small Desire to Eat	A Moderate Desire to Eat	A Strong Urge to Eat	An Overwhelming Urge to Eat
1. Resentful	_____	_____	_____	_____	_____
2. Discouraged	_____	_____	_____	_____	_____
3. Shaky	_____	_____	_____	_____	_____
4. Worn Out	_____	_____	_____	_____	_____
5. Inadequate	_____	_____	_____	_____	_____
6. Excited	_____	_____	_____	_____	_____
7. Rebellious	_____	_____	_____	_____	_____
8. Blue	_____	_____	_____	_____	_____
9. Jittery	_____	_____	_____	_____	_____
10. Sad	_____	_____	_____	_____	_____
11. Uneasy	_____	_____	_____	_____	_____
12. Irritated	_____	_____	_____	_____	_____
13. Jealous	_____	_____	_____	_____	_____
14. Worried	_____	_____	_____	_____	_____
15. Frustrated	_____	_____	_____	_____	_____
16. Lonely	_____	_____	_____	_____	_____
17. Furious	_____	_____	_____	_____	_____
18. On edge	_____	_____	_____	_____	_____
19. Confused	_____	_____	_____	_____	_____
20. Nervous	_____	_____	_____	_____	_____
21. Angry	_____	_____	_____	_____	_____
22. Guilty	_____	_____	_____	_____	_____
23. Bored	_____	_____	_____	_____	_____
24. Helpless	_____	_____	_____	_____	_____
25. Upset	_____	_____	_____	_____	_____

Self Efficacy Scale – Exercise

Using the scale below as a yardstick, please answer the following: How confident are you that you could exercise under each of the following conditions over the next 6 months?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
I cannot do it at all				moderately certain that I can do it						certain that I can do it

I could exercise:	Confidence rating 0-100%
a. when tired.	
b. during or following a personal crisis.	
c. when feeling depressed.	
d. when feeling anxious.	
e. during bad weather.	
f. when slightly sore from the last time I exercised.	
g. when on vacation.	
h. when there are competing interests (like my favorite TV show).	
i. when I have a lot of work to do.	
j. when I haven't reached my exercise goals.	
k. when I don't receive support from my family/friends.	
l. when I have not exercised for a prolonged period of time.	
m. when I have no one to exercise with.	

n. when my schedule is hectic. _____

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
I cannot do it at all — moderately certain that I can do it — certain that I can do it

o. when my exercise workout is not enjoyable. _____

In general, I believe I could exercise at my target heart rate three to five times per week for 30-40 minutes over the next 6 months. _____

Impact of Weight on Quality of Life Questionnaire—Lite Version (IWQOL-Lite)

Please answer the following statements by circling the number that best applies to you in the past week. Be as open as possible. There are no right or wrong answers.

Physical Function		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I have trouble picking up objects.	5	4	3	2	1
2.	Because of my weight I have trouble tying my shoes.	5	4	3	2	1
3.	Because of my weight I have difficulty getting up from chairs.	5	4	3	2	1
4.	Because of my weight I have trouble using stairs.	5	4	3	2	1
5.	Because of my weight I have difficulty putting on or taking off my clothing.	5	4	3	2	1
6.	Because of my weight I have trouble with mobility.	5	4	3	2	1
7.	Because of my weight I have trouble crossing my legs.	5	4	3	2	1
8.	I feel short of breath with only mild exertion.	5	4	3	2	1
9.	I am troubled by painful or stiff joints.	5	4	3	2	1
10.	My ankles and lower legs are swollen at the end of the day.	5	4	3	2	1
11.	I am worried about my health.	5	4	3	2	1
Self-esteem		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I am self-conscious.	5	4	3	2	1
2.	Because of my weight my self-esteem is not what it could be.	5	4	3	2	1
3.	Because of my weight I feel unsure of myself.	5	4	3	2	1
4.	Because of my weight I don't like myself.	5	4	3	2	1
5.	Because of my weight I am afraid of being rejected.	5	4	3	2	1
6.	Because of my weight I avoid looking in mirrors or seeing myself in photographs.	5	4	3	2	1
7.	Because of my weight I am embarrassed to be seen in public places.	5	4	3	2	1

Sexual Life		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I do not enjoy sexual activity.	5	4	3	2	1
2.	Because of my weight I have little or no sexual desire.	5	4	3	2	1
3.	Because of my weight I have difficulty with sexual performance.	5	4	3	2	1
4.	Because of my weight I avoid sexual encounters whenever possible.	5	4	3	2	1

Public Distress		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I experience ridicule, teasing, or unwanted attention.	5	4	3	2	1
2.	Because of my weight I worry about fitting into seats in public places (e.g. theaters, restaurants, cars, or airplanes).	5	4	3	2	1
3.	Because of my weight I worry about fitting through aisles or turnstiles.	5	4	3	2	1
4.	Because of my weight I worry about finding chairs that are strong enough to hold my weight.	5	4	3	2	1
5.	Because of my weight I experience discrimination by others.	5	4	3	2	1
Work (Note: For homemakers and retirees, answer with respect to your daily activities.)		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I have trouble getting things accomplished or meeting my responsibilities.	5	4	3	2	1
2.	Because of my weight I am less productive than I could be.	5	4	3	2	1
3.	Because of my weight I don't receive appropriate raises, promotions or recognition at work.	5	4	3	2	1
4.	Because of my weight I am afraid to go on job interviews.	5	4	3	2	1

THE MOS 36-ITEM SHORT-FORM HEALTH SURVEY (SF-36)

INSTRUCTIONS: This survey asks you for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Answer every question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer that you can.

1. In general, would you say your health is:

(Circle one)

Excellent……..1

Very Good……2

Good…….3

Fair……4

Poor……...5

2. Compared to one year ago, how would you rate your health in general now?

(Circle one)

Much better now than one year ago……..1

Somewhat better now than one year ago……...2

About the same as one year ago……3

Somewhat worse now than one year ago……..4

Much worse now than one year ago……..5

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

ACTIVITIES	YES Limited A Lot	YES Limited A Little	NO, Not Limited At All
a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	**1**	**2**	**3**
b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	**1**	**2**	**3**
c. Lifting or carrying groceries	**1**	**2**	**3**
d. Climbing **several** flights of stairs	**1**	**2**	**3**
e. Climbing **one** flight of stairs	**1**	**2**	**3**
f. Bending, kneeling, or stooping	**1**	**2**	**3**
g. Walking **more than a mile**	**1**	**2**	**3**
h. Walking **several blocks**	**1**	**2**	**3**
i. Walking **one block**	**1**	**2**	**3**
j. Bathing or dressing yourself	**1**	**2**	**3**

4. During the past 4 weeks have you had any of the following health problems with your work or other regular activities as a result of your physical health?

	YES	**NO**
a. Cut down on the **amount of time** that you spent on work or other activities	**1**	**2**
b. Accomplished less than you would like	**1**	**2**
c. Were limited in the **kind** or work or other activities	**1**	**2**
d. Had **difficulty** performing the work or other activities (for example, it took extra effort)	**1**	**2**

5. During the **past 4 weeks**, have you had any of the following problems with your work or other daily as a result of any emotional problems (such as feeling depressed or anxious) ?

	YES	NO
a. Cut down on the **amount of time** you spent on work or activities	**1**	**2**
b. Accomplished less than you would like	**1**	**2**
c. Didn't do work or other activities as **carefully** as usual	**1**	**2**

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

(Circle one)

Not at all……..1

Slightly……2

Moderately……..3

Quite a bit……4

Extremely……5

7. How much bodily pain have you had in the past 4 weeks?

None……1

Very mild……2

Mild……..3

Moderate……..4

Severe……...5

Very severe……..6

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

(Circle one)

Not at all……....1

A little bit……...2

Moderately…….3

Quite a bit……...4

Extremely……...5

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give one answer that comes closest to the way that you have been feeling. How much of the time in the past 4 weeks:

(Circle one number on each line)

	All of the Time	Most of the Time	A Good bit of the Time	Some of the Time	Little of the Time	None of the Time
a. Did you feel full of pep?	**1**	**2**	**3**	**4**	**5**	**6**
b. Have you been a very Nervous person?	**1**	**2**	**3**	**4**	**5**	**6**
c. Have you felt so down In the dumps that Nothing could cheer You up?	**1**	**2**	**3**	**4**	**5**	**6**
d. Have you felt calm and Peaceful?	**1**	**2**	**3**	**4**	**5**	**6**
e. Did you have a lot of Energy?	**1**	**2**	**3**	**4**	**5**	**6**
f. Have you felt Downhearted and blue?	**1**	**2**	**3**	**4**	**5**	**6**
g. Did you feel worn out?	**1**	**2**	**3**	**4**	**5**	**6**
h. Have you been a happy person?	**1**	**2**	**3**	**4**	**5**	**6**
i. Did you feel tired?	**1**	**2**	**3**	**4**	**5**	**6**

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

(Circle one)

All of the time……1

Most of the time…….2

Some of the time……3

A little bit of the time…….4

None of the time…….5

11. How TRUE or FALSE is each of the following statements for you?

(circle one number on each line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a Little easier than Other people	**1**	**2**	**3**	**4**	**5**
b. I am as healthy as Anybody I know	**1**	**2**	**3**	**4**	**5**
c. I expect my health to Get worse	**1**	**2**	**3**	**4**	**5**
d. My health is Excellent	**1**	**2**	**3**	**4**	**5**

The PANAS – Present

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

____ interested	____ irritable
____ distressed	____ alert
____ excited	____ ashamed
____ upset	____ inspired
____ strong	____ nervous
____ guilty	____ determined
____ scared	____ attentive
____ hostile	____ jittery
____ enthusiastic	____ active
____ proud	____ afraid

The statements below reflect experiences that people who are overweight or obese may have from time to time. Please read each statement carefully, and indicate how strongly you agree or disagree with the statement, using the scale printed below.

Not Applicable	Strongly Disagree	Disagree	Agree	Strongly Agree
0	1	2	3	4

_____ 1. My employer/co-workers have discriminated against me.

_____ 2. Some people act as though I am less competent than usual.

_____ 3. I feel I have been treated with less respect than usual by others.

_____ 4. I feel others are concerned they could "catch" my condition through contact like a handshake or eating food I prepare.

_____ 5. I feel others avoid me because of my condition.

_____ 6. Some family members have rejected me because of my condition.

_____ 7. I feel some friends have rejected me because of my condition.

_____ 8. I encounter embarrassing situations as a result of my condition.

_____ 9. Due to my condition others seem to feel awkward and tense when they are around me.

_____ 10. I have experienced financial hardship that has affected how I feel about myself.

_____ 11. My job security has been affected by my condition.

_____ 12. I have experienced financial hardship that has affected my relationship with others.

_____ 13. I feel others think I am to blame for my condition.

_____ 14. I do not feel I can be open with others about my condition.

_____ 15. I fear someone telling others about my condition without my permission.

_____ 16. I feel I need to keep my condition a secret.

_____ 17. I feel I am at least partially to blame for my condition.

_____ 18. I feel set apart from others who are well.

_____ 19. I have a greater need than usual for reassurance that others care about me.

_____ 20. I feel lonely more often than usual.

_____ 21. Due to my condition, I have a sense of being unequal in my relationships with others.

_____ 22. I feel less competent than I did before my condition.

_____ 23. Due to my condition, I sometimes feel useless.

_____ 24. Changes in my appearance have affected my social relationships.

Body Image Group Rating Form

Below is a list of adjectives. Please rate your experience with the body image group by indicating the degree to which each adjective describes your feelings about the group.

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly agree
Helpful	1	2	3	4	5
Uncomfortable	1	2	3	4	5
Relevant	1	2	3	4	5
Unproductive	1	2	3	4	5
Worthwhile	1	2	3	4	5
Difficult	1	2	3	4	5
Thought-Provoking	1	2	3	4	5
Organized	1	2	3	4	5
Awkward	1	2	3	4	5
Supportive	1	2	3	4	5
Unnecessary	1	2	3	4	5
Challenging	1	2	3	4	5

Please use the space below to elaborate on your ratings or to provide us with additional feedback about the group. Feel free to comment on both positive and negative features. We value your feedback!

Logging your dietary intake

Time of Day	Description of food	Calories

Did you stay within my calorie limit for today? YES NO

How many types of vegetables did you eat? _____

How many types of fruits did you eat? _____

Logging your physical activity

How many steps did you take today? _____

Did I reach my step goal for today? YES NO

Did you exercise today? (circle one) YES NO

If yes: please fill in the chart below for each type of exercise

Type of exercise	**Length of time spent doing activity (in minutes)**	**Intensity (low, moderate, vigorous)**

Please note any reason for not wearing your pedometer:

Appendix D.

BODY PROJECT
Session Adherence
Session 1
School:_____ Rater:_____
Group:_____ Date of Rating:_____
Date of Session:_____
Primary Group Facilitator:_____

10 = Perfect! Absolutely all material in the section was presented exactly as written (100%).
9 = Excellent. All key concepts and almost all material in the section were presented (95%).
8 = Very good. All key concepts were presented but some supporting material skipped (90%).
7 = Good. Most key concepts of the section were presented (80%).
6 = Fair. One key concept was not presented (70%).
5 = Mediocre. The majority of key concepts were presented but significant gaps (60%).
4 = Minimal adherence. The majority of key concepts were presented but poorly (50%).
3 = Poor. The majority of the key concepts were not presented (<50%).
2 = Very poor. Material of this section was mentioned only very briefly (10%).
1 = No adherence. The section was skipped entirely.

Rating Segment/Content

10 9 8 7 6 5 4 3 2 1 Introduction (5 min)

10 9 8 7 6 5 4 3 2 1 Voluntary commitment and overview (2 min)

10 9 8 7 6 5 4 3 2 1 Definition and origin of the thin-ideal (15 min)

10 9 8 7 6 5 4 3 2 1 Costs associated with pursuing the thin-ideal (20 min)

10 9 8 7 6 5 4 3 2 1 Assign home exercises: (1) letter to adolescent girl, and (2) mirror self-affirmation exercise (3 min)

BODY PROJECT
Session Adherence
Session 2
School:_____ Rater:_____
Group:_____ Date of Rating:_____
Date of Session:_____
Primary Group Facilitator:_____

10 = Perfect! Absolutely all material in the section was presented exactly as written (100%).
9 = Excellent. All key concepts and almost all material in the section were presented (95%).
8 = Very good. All key concepts were presented but some supporting material skipped (90%).
7 = Good. Most key concepts of the section were presented (80%).
6 = Fair. One key concept was not presented (70%).
5 = Mediocre. The majority of key concepts were presented but significant gaps (60%).
4 = Minimal adherence. The majority of key concepts were presented but poorly (50%).
3 = Poor. The majority of the key concepts were not presented (<50%).
2 = Very poor. Material of this section was mentioned only very briefly (10%).
1 = No adherence. The section was skipped entirely.

Rating Segment/Content

10 9 8 7 6 5 4 3 2 1 Reinforce voluntary commitment

10 9 8 7 6 5 4 3 2 1 Letter recording and debriefing (20 min)

10 9 8 7 6 5 4 3 2 1 Self-affirmation exercise debriefing (10 min)

10 9 8 7 6 5 4 3 2 1 Role plays to discourage pursuit of thin-ideal (20 min)

10 9 8 7 6 5 4 3 2 1 Assign home exercise: (1) verbal challenge form, and (2) Top-10 list (3 min)

BODY PROJECT
Session Adherence
Session 3
School:_____ Rater:_____
Group:_____ Date of Rating:_____
Date of Session:_____
Primary Group Facilitator:_____

10 = Perfect! Absolutely all material in the section was presented exactly as written (100%).
9 = Excellent. All key concepts and almost all material in the section were presented (95%).
8 = Very good. All key concepts were presented but some supporting material skipped (90%).
7 = Good. Most key concepts of the section were presented (80%).
6 = Fair. One key concept was not presented (70%).
5 = Mediocre. The majority of key concepts were presented but significant gaps (60%).
4 = Minimal adherence. The majority of key concepts were presented but poorly (50%).
3 = Poor. The majority of the key concepts were not presented (<50%).
2 = Very poor. Material of this section was mentioned only very briefly (10%).
1 = No adherence. The section was skipped entirely.

Rating Segment/Content

10 9 8 7 6 5 4 3 2 1 Reinforcing voluntary commitment

10 9 8 7 6 5 4 3 2 1 Verbal challenge exercise debriefing (10 min)

10 9 8 7 6 5 4 3 2 1 Quick comebacks to thin-ideal statements (10 min)

10 9 8 7 6 5 4 3 2 1 Reasons for signing up for this class (10 min)

10 9 8 7 6 5 4 3 2 1 Behavioral experiment to challenge body image concerns (10 min)

10 9 8 7 6 5 4 3 2 1 Top 10 list debriefing (15 min)

10 9 8 7 6 5 4 3 2 1 Assign home exercises (1) do one experiment relating to personal body image concerns, and (2) do two body activism exercises (3 min)

BODY PROJECT
Session Adherence
Session 4
School:_____ Rater:_____
Group:_____ Date of Rating:_____
Date of Session:_____
Primary Group Facilitator:_____

10 = Perfect! Absolutely all material in the section was presented exactly as written (100%).
9 = Excellent. All key concepts and almost all material in the section were presented (95%).
8 = Very good. All key concepts were presented but some supporting material skipped (90%).
7 = Good. Most key concepts of the section were presented (80%).
6 = Fair. One key concept was not presented (70%).
5 = Mediocre. The majority of key concepts were presented but significant gaps (60%).
4 = Minimal adherence. The majority of key concepts were presented but poorly (50%).
3 = Poor. The majority of the key concepts were not presented (<50%).
2 = Very poor. Material of this section was mentioned only very briefly (10%).
1 = No adherence. The section was skipped entirely.

Rating Segment/Content

10 9 8 7 6 5 4 3 2 1 Reinforcing voluntary commitment (2 min)

10 9 8 7 6 5 4 3 2 1 Behavioral challenge debriefing (10 min)

10 9 8 7 6 5 4 3 2 1 Body activism debriefing (10 min)

10 9 8 7 6 5 4 3 2 1 Challenging fat talk (10 min)

10 9 8 7 6 5 4 3 2 1 Future pressures to be thin (10 min)

10 9 8 7 6 5 4 3 2 1 Self-affirmation exercise (5 min)

10 9 8 7 6 5 4 3 2 1 Assign home exercise: (1) choose one positive body talk exercise and do it during the next week, and (2) write email letter to teenage girl telling her how to avoid body image concerns (3 min)

10 9 8 7 6 5 4 3 2 1 Closure