EAT FOR LIFE: A QUASI-EXPERIMENTAL TRIAL OF A NOVEL
MINDFULNESS-BASED INTUITIVE EATING INTERVENTION

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By
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The undersigned, appointed by the dean of the Graduate School, have examined the
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ABSTRACT

The purpose of this quasi-experimental study was to examine the efficacy of a novel community-based intervention for adult women with a range of eating and weight-related concerns. It is the first study of an intervention, called Eat for Life, that combines two innovative paradigms, Intuitive Eating and Mindfulness, to assist women in re-learning positive, sustainable relationships with food and their bodies. Specifically, the study examined whether Eat for Life contributes to increased intuitive eating, body appreciation, and mindfulness, as well as decreased disordered eating. The study also sought to examine whether mindfulness mediated the relationship between group and the other outcome variables. Female employees of the UM system (N = 124) enrolled in the intervention group or wait-list control group and were assessed at pre- and post-10 week intervention or interim. ANCOVAs and ordinal regression were utilized to measure differences between groups. At post-10 weeks, participants in the intervention group demonstrated significantly greater scores on intuitive eating, body appreciation, mindfulness, and lower disordered eating than participants in the wait-list control group. Further, mindfulness was found to be a partial mediator of the relationships between group (e.g., Eat for Life condition or wait-list control) and the other outcome variables (e.g., intuitive eating, body appreciation, and disordered eating category). Implications for future research, prevention, and counseling are discussed.
Chapter One: Introduction

Experiencing a problematic relationship with food and one’s body is prevalent among U.S. women. These difficult relationships are evident in women’s high rates of obesity, body dissatisfaction, and disordered eating behaviors (Smith & Hawks, 2006). Although eating and weight-related concerns have most commonly been studied in girls and college-aged women (Peat, Peyerl, & Muehlenkamp, 2008), these issues are also worthy of study in adult women in the general population. The prevalence of obesity among adult women in the U.S. is startling; national community studies suggest that 33.2% of women are obese (Ogden et al., 2006). Certainly, body dissatisfaction and disordered eating are also pervasive among adult women. More specifically, although full-syndrome Anorexia Nervosa and Bulimia Nervosa are relatively uncommon in adult women in nonclinical samples (Hoek & van Hoeken, 2003), Binge Eating Disorder (BED) is significantly more widespread, with one community study finding that approximately 3.5% of women suffer from full-syndrome BED (Hudson, Hiripi, Pope, & Kessler, 2007). Further, sub-threshold eating disorder symptomology is particularly prevalent in women, with one study finding that nearly 4% of such women vomit regularly to lose weight, 10% binge eat at least once a week, and nearly 30% report often losing control over eating (Striegel-Moore et al., 2009). Finally, the experience of disliking one’s body shape or size also appears to be both common and quite stable across women’s lifespan (Tiggemann & Lynch, 2001).

The psychologically and physically detrimental issues of body dissatisfaction, disordered eating, and obesity are inextricably tied. First, individuals with body image
disturbance experience higher rates of psychological distress, such as depression and social anxiety (Jarry & Berardi, 2004). Body dissatisfaction has also been repeatedly shown to be a significant factor in the development and maintenance of eating pathology (Stice, 2002). It is also well-documented that individuals with disordered eating experience numerous psychological and physical consequences (Wilson, Grilo, & Vitousek, 2007). To further elucidate, these harmful consequences are not restricted to full-syndrome eating disorders. As eating disorders are widely conceptualized as a continuum (Mintz, O’Halloran, Muholland, & Schneider, 1997; Tylka & Subich, 1999), research has documented that some individuals with eating disorder symptomology experience nearly equivalent distress as those with full-syndrome eating disorders. For example, one study found no difference between women with subthreshold and full-syndrome Binge Eating Disorder in their body weight and psychological functioning (Striegel-Moore et al., 2000). Furthermore, individuals who demonstrate eating pathology, such as chronic dieting and binge eating, are at higher risk for obesity and overweight (Desai, Miller, Staples, & Bravender, 2008). Indeed, prevalence rates of BED in obese individuals attending weight-loss programs are as high as 30% (Dingemans, Bruna, & van Furth, 2002). Obesity has been shown to be a risk factor for a number of adverse health consequences, including heart disease, and Type II diabetes (National Heart, Lung, and Blood Institute, 1998). Moreover, weight and shape concerns (e.g., body dissatisfaction) have been found to fully mediate the relationship between obesity and impairment in psychosocial functioning (Mond et al., 2007). In short, obesity, body dissatisfaction, and disordered eating represent significant and interrelated difficulties
for women. In fact, these problematic relationships with food and one’s body are so common that researchers have called them “normative discontent” in women’s lives (Rodin, Silberstein, & Striegel-Moore, 1985, p. 267).

In terms of their etiology, much research has pointed to a variety of sociocultural influences that underlie this spectrum of eating and weight concerns. This toxic amalgam includes the media’s emphasis on thinness as the ideal body type for women (Stice & Shaw, 1994) and the pervasive promulgation of restrictive and ultimately harmful diet programs as the answer to weight-loss (Mann et al., 2007; Miller, 1999). Further, newer research has cited the growth of obesogenic environments, or social and economic conditions that promote obesity, as contributing to the pervasiveness of weight difficulties in the U.S. (Adler & Stewart, 2009; Finkelstein, Ruhm, & Kosa, 2005). Indeed, the combination of these cultural influences appears to have created a fertile climate for this wide-range of eating and weight concerns to proliferate among women (Neumark-Sztainer et al., 2006).

**Existing Interventions**

Given the effect of these co-existing environmental influences and their harmful repercussions for young girls, prevention efforts of the past decade have focused on the prevention of obesity and eating disorders simultaneously, with body dissatisfaction being one primary risk factor targeted in such prevention interventions (Mintz, Hamilton, Bledman, & Franko, 2007; Neumark-Sztainer et al., 2006). However, while prevention researchers have worked to create programs that target the spectrum of eating and weight-related difficulties (Neumark-Sztainer et al., 2006), intervention
programs have been much more limited in scope. While it is apparent that many adult women in the general population are struggling with one or more of these problematic relationships with food and their bodies, a study of an intervention that meets the full range of their needs has not been published to-date. Instead, the vast majority of existing interventions target either obesity or eating disorders (Dingemans et al., 2002; Wilson et al., 2007).

In terms of the obesity interventions, the majority focus on weight-loss through a combination of calorie restrictive dieting, physical activity programs, and behavioral therapy to increase adherence (McTigue et al., 2003; National Heart, Lung, and Blood Institute, 1998). Importantly, outcome research reveals that the majority of these interventions lead to short-term weight-loss only, and that many individuals regain the weight, plus more, over the long-term (Mann et al., 2007; Miller, 1999; Sacks et al., 2009).

Similarly ineffective to date are the vast majority of eating disorder interventions, most of which target a single, full-syndrome eating disorder in clinical studies (Wilson et al., 2007). Specifically, interventions for Anorexia Nervosa have demonstrated little efficacy (Fairburn, 2005). While Cognitive-Behavioral therapy (CBT-BN; Fairburn, Marcus, & Wilson, 1993) has been found to be effective for Bulimia Nervosa, it is effective for only 30-50% of young women (Agras et al., 2000(a); Wilson et al., 2007). Lastly, while there have been several promising interventions for BED, such as Dialectical Behavior Therapy (Telch, Agras, & Linehan, 2001), research on BED is so new that no definitive recommendations have been made on a best-practices intervention.
(National Institute for Health and Clinical Excellence (NICE), 2004). Also, most studies on the efficacy of ED interventions have been conducted with college women or younger-aged girls (Peat et al., 2008). Only a limited few interventions have been designed to assist community women.

**Summary of the Problem**

Adult women in the community are experiencing a range of eating disordered behavior and weight concerns. Indeed, if a woman is experiencing one of these problematic relationships with food or her body (i.e. obesity, disordered eating, and/or body dissatisfaction), she is at risk for one or both of the other two (Desai et al., 2008; Mond et al., 2007; Neumark-Sztainer et al. 2006). Exiting interventions are limited in scope and targeted population. As such, a holistic intervention is needed that teaches adult women in the community with a broad range of eating and weight issues how to re-learn positive relationships with food and their bodies. This is the focus of the present study. More specifically, this study aims to examine the efficacy of a community based intervention for a range of eating and weight concerns. The intervention tested is *Eat for Life*.

**Eat for Life**

*Eat for Life* is a workplace wellness program that was designed to meet the needs of adult employees on a four campus university system with a wide range of problematic relationships with food and their bodies. In order to provide a program that targets the spectrum of disordered eating, body dissatisfaction, and obesity/overweight that is pervasive in adults in community samples, the *Eat for Life* program was created
by combining two innovative paradigms believed to assist individuals in developing a healthy, sustainable relationship with food and one’s body: Intuitive Eating and Mindfulness.

**Intuitive Eating.** Intuitive Eating is a non-diet approach to helping individuals re-learn how to eat, engage in physical activity, and experience their body based on internal cues. First, Intuitive Eating theory (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995) asserts that people eat for three main reasons: physiological, environmental, and emotional. The approach specifies that eating for physiological reasons is the most metabolically adaptive, but that due to the effects of restrictive diet programs, we lose touch with eating based on our innate hunger and satiety cues. The theory asserts that if individuals can learn to decrease disordered eating (e.g., eating for emotional or environmental reasons), increase eating when they are hungry, and stop eating when they are satiated, they will gain, lose, or maintain the weight that is needed for their bodies. Second, the theory postulates that people develop a similar relationship with physical activity due to repeatedly failing at prescriptive exercise regimens. The authors of the theory assert that if individuals begin listening to their bodies’ need for movement and engage in activities that feel good to their body, they will be more likely to sustain physical activity (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995). Finally, the theorists suggest that people develop negative body image due to being influenced by external cues (e.g., media images of extremely thin models) and being overly concerned with what their bodies look like and how much they weigh, rather than experiencing what their bodies feel like from the inside. The premise of this theory is
that if individuals decrease their preoccupation with their body size and shape and instead respect their bodies’ internal cues, they will be more likely to refrain from starving and over-feeding themselves (Gast & Hawks, 1998; Tribole & Resch, 1995).

Several correlational studies have found an intuitive eating style to be associated with a range of positive psychological and physical health outcomes. Indeed, people who are higher on measures of intuitive eating tend to have a lower body mass index (BMI) and make more healthful nutritional choices (Hawks, Madanat, Hawks, & Harris, 2005; Tylka, 2006). Further, intuitive eating has also been found to be inversely related to disordered eating, internalized pressure for thinness, and body dissatisfaction (Tylka, 2006). However, despite these demonstrated positive benefits and the increased media attention on Intuitive Eating in recent years (Mathieu, 2009), there has not been a published study of the Intuitive Eating approach outlined in Tribole & Resch’s (1995) book, *Intuitive Eating: A Revolutionary Program that Works*.

The closest interventions to the Intuitive Eating model for which outcome research has been conducted are the Non-Diet and Health-At-Every-Size (HAES) interventions (Bacon et al., 2002; Bacon, Stern, Van Loan, & Kein, 2005; Carrier, Steinhardt, & Bowman, 1994; Ciliska, 1998; Ominchinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan, Seddon, & Vernon-Roberts, 1989). While these interventions are somewhat varied in their approaches, they are similar in their encouragement of body size acceptance, an unrestricted style of eating based on internal hunger and satiety cues, and incorporating physical activity that is enjoyable and sustainable. Studies of six of these interventions have been published in the
literature to date (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Ominchinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). A common outcome of each of these intervention studies was a significant decrease in participants’ levels of adverse dieting behaviors and consequences (e.g., restriction and emotional eating), as well as sustained increases in an unrestrained, internally-focused style of eating (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). These changes were demonstrated from pre- to post-intervention (Ciliska, 1998; Provencher et al., 2007; Roughan et al., 1989), as well as over longer-term follow-ups, from one to three years in length (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Omichinski & Harrison, 1995; Provencher et al., 2009). Importantly, in each of the intervention studies that tested for additional psychological variables, participants also demonstrated significant and sustained increases in body- and self-acceptance (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Omichinski & Harrison, 1995; Provencher et al., 2009).

**Mindfulness.** Mindfulness is commonly defined as “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994, p. 4). Mindfulness has been found to be associated with a wide range of positive psychological benefits, including lower levels of anxiety and depression and higher self-esteem (Brown & Ryan, 2003). Observing the benefits of mindfulness through Buddhist contemplative practices, Jon Kabat-Zinn created a secular program of mindfulness training called Mindfulness-based Stress Reduction (MBSR) for patients with chronic
pain and stress-related conditions (Kabat-Zinn, 1982). The program teaches participants to engage in formal meditation and to bring mindful awareness to their daily lives. MBSR was initially found to contribute to a myriad of sustained improvements in participants’ well-being (Kabat-Zinn, 1982), and has since been utilized to treat numerous other conditions (Baer, 2006). The format of MBSR has also been adapted to Mindfulness-based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002) for Mood Disorders, as well as Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999) for Binge Eating Disorder. Other psychological interventions with foundations in mindfulness, among other schools of thought, include Dialectical Behavior Therapy (DBT; Linehan, 1993) and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999). Both of these interventions have been adapted for the treatment of disordered eating (Safer, Telch, & Agras, 2001; Telch et al., 2001) and obesity (Forman, Butryn, Hoffman, & Herbert, 2009; Tapper et al., 2001), with both demonstrating preliminary efficacy in symptom reduction.

Recent research has begun to elucidate the mechanisms of mindfulness. Shapiro, Carlson, Astin, & Freedman (2006) proposed the practice of intentionally attending to life with a nonjudgmental stance, which they termed “reperceiving,” (p. 377) to be the meta-mechanism of mindfulness. They asserted that this shift in perspective leads to four mechanisms of action: (a) self-regulation; (b) values clarification; (c) cognitive, emotional, and behavioral flexibility; and (d) exposure. Indeed, these mechanisms of mindfulness have gained preliminary empirical support in a variety of mindfulness studies (Baer, 2006; Brown & Ryan, 2003; Segal et al., 2002). While each of the authors
of the mindfulness-based interventions for eating and weight-related concerns mentioned above (e.g., Kristeller & Hallett, 1999; Safer et al., 2001) has their own specific perspective on why mindfulness is helpful for these issues, it appears that the aforementioned mechanisms of self-regulation and exposure, as well as the attitudinal quality of acceptance, are central in many of their theories (Baer, 2006).

Four studies of mindfulness-based approaches to eating and weight concerns were salient in the development of the current *Eat for Life* intervention examined in this study. These interventions were selected because they are in line with the MBSR format and philosophy in which the primary developer (Dr. Lynn Rossy) of *Eat for Life* was trained. Additionally, these four interventions were selected as the *Eat for Life* foundation because they target a spectrum of problematic relationships with food and one’s body often seen in the general population (e.g., full-syndrome Binge Eating Disorder, sub-threshold Binge Eating Disorder, and obesity). Taken together, these four studies present preliminary evidence of the efficacy of mindfulness-based interventions for the treatment of these concerns. First, an uncontrolled study of Mindfulness-based Eating Awareness Training found that a sample of women with Binge Eating Disorder decreased the number and intensity of their binges (Kristeller & Hallett, 1999). Second, an adaptation of Mindfulness-based Cognitive Therapy (MBCT) for the treatment of full-syndrome and sub-threshold Binge Eating Disorder found that while some participants reported increases in subjective binges (e.g., what they termed a binge), all participants reported decreases in objective binge eating episodes per month (Baer, Fischer, & Huss, 2006). Next, an uncontrolled study of a MBSR program adapted for sub-threshold binge
eating behaviors found moderate to large decreases in binge behaviors (Smith, Shelley, Leahigh, & Vanleit, 2006). Finally, a randomized controlled trial of the Mindful Eating and Living (MEAL) program found that obese women in the program lost significantly more weight and had improved health correlates as compared to women in a traditional weight-loss program (Shelley, 2009).

**Description of Eat for Life intervention.** *Eat for Life* is a 10-week group intervention that combines intuitive eating and mindfulness to help participants with a spectrum of eating and weight concerns develop a healthy, sustainable relationship with food and their bodies. Specifically, the program seeks to help participants increase intuitive eating, mindfulness, and body appreciation, while also decreasing disordered eating behaviors. The intervention uses Tribole & Resch’s *Intuitive Eating* self-help book to educate participants in re-learning how to listen to their internal cues for eating and movement, and to gain appreciation for their bodies. The program then uses mindfulness practices (i.e., sitting meditations, yoga, mindful eating meditations) as the experiential process to teach participants how to become aware of their internal cues and self-regulate, as well as to bring acceptance to themselves and their experience. Practices were drawn from two of the mindful eating programs mentioned above, MB-EAT (Kristiller & Hallett, 1999) and MEAL (Shelley, 2009), as well as MBSR (Kabat-Zinn, 1982), the foundational mindfulness program on which each of the aforementioned mindful eating programs were based (Baer et al., 2006; Kristeller & Hallett; Shelley, 2009; Smith et al., 2006). Participants engage in these practices both in the class and at home, using a CD of meditations recorded the developer of *Eat for Life*. A preliminary
pre-post study of *Eat for Life* found participants to significantly increase intuitive eating, mindfulness, and decrease body dissatisfaction (Rossy, Bush, & Bike, 2009). The current study builds upon this preliminary study.

**The Current Study**

The purpose of the current, quasi-experimental study is to further validate the *Eat for Life* intervention in a community sample of adult women presenting with a range of disordered eating behaviors (with the exclusion of full-syndrome Anorexia Nervosa and Bulimia Nervosa), body dissatisfaction, obesity and overweight. Consistent with the Intuitive Eating theory, the program encourages a de-emphasis on weight. As such, participants’ body mass index (BMI) was used as an outcome measure. Rather, changes in the related measures of body appreciation and eating behaviors were assessed, as well as improvements in the adaptive constructs of intuitive eating and mindfulness. Further, increases in participants’ level of mindfulness were analyzed as a possible mediator of improvements in intuitive eating, body appreciation, and disordered eating category.
Hypotheses:

1. Participants in the *Eat for Life* condition will demonstrate significantly greater scores on the dependent variables (Intuitive Eating, Mindfulness, Body appreciation, and Eating Disorder Category) than those in the wait-list control group.

2. Increases in Mindfulness will mediate the relationship between Group (e.g., *Eat for Life* condition or wait-list control group) and the other dependent variables (e.g., Intuitive Eating, Body Appreciation, and Eating Disorder Category).
Chapter Two: Review of the Literature

Problematic relationships with food and one’s body are rampant among women in the United States. This is evidenced in the high prevalence of women experiencing obesity, disordered eating, and body dissatisfaction (Smith & Hawks, 2006). Although the vast majority of research on these issues has focused on girls and young women in student samples (Peat et al., 2008), the significance of these issues in adult women in the general population also warrants attention. First, the growing rates of obesity are increasingly being termed an epidemic for U.S. adults (World Health Organization, 2008). The prevalence of obesity has nearly doubled since 1980, and the most recent national estimates suggest that over 33.2% of women are obese (Ogden et al., 2006). Certainly, experts have emphasized that it will be difficult to reverse the trend of rising obesity in the United States (Flegal et al., 2002). In terms of eating disorders, although full-syndrome Anorexia Nervosa (AN) and Bulimia Nervosa (BN) are relatively uncommon among adult women in the general population (Hoek & van Hoeken, 2003), Binge Eating Disorder (BED) appears to be much more widespread among women in nonclinical samples. A recent survey using a community sample of U.S. adults found a lifetime prevalence of .9% for AN and 1.5% for BN, but a rate of 3.5% of BED for women (Hudson et al., 2007). Notably, individuals with BED who seek treatment tend to be older than those with AN and BN (Wilson et al., 2007). Further, subclinical eating disorder symptoms in community samples may be even more common, with a recent study reporting 10% of their sample binge eating at least once a week, 6% reporting fasting frequently to lose weight, and nearly 4% vomiting often to lose weight (Striegel-
Moore et al., 2009). In addition, women also experience a high level of body dissatisfaction and body shame, which has been found to be remarkably stable experience across their lifespan (Tiggemann & Lynch, 2001; Webster & Tiggeman, 2003). For example, a community study of 475 women aged 60-70 years demonstrated that almost 90% of the sample reported “feeling fat” and 60% exhibited a low to moderate level of body satisfaction. Further, even of participants with normal or low weight, according to body mass index (BMI), over one-third reported such negative attitudes towards their bodies (Mangweth-Matzek et al., 2006).

Notably, the above discussed eating and weight concerns of obesity, disordered eating and body dissatisfaction are closely intertwined and often cyclical. To illustrate, women who suffer from body dissatisfaction are at high-risk for the development and/or maintenance of disordered eating behaviors (Stice, 2002). Further, individuals who demonstrate disordered eating behaviors, such as chronic dieting and binge eating, are at risk for the development of obesity (Desai et al., 2008). To illustrate, approximately 30% of people with Binge Eating Disorder are obese, with obesity increasing over time with continued binge eating (Dingemans et al., 2002; Striegel-Moore et al., 2001). Finally, obese women tend to experience greater body dissatisfaction than non-obese women (Sarwer, Wadden, & Foster, 1998).

In short, adult women in the United States commonly struggle with an interrelated combination of concerns with eating and their bodies. In fact, the prevalence of these concerns has become so prominent that some researchers have infamously stated that they comprise “normative discontent” among women (Rodin et
The normative nature of these concerns is troubling, due to the significant costs for women, including detriments to women’s health and well-being. Obesity has been shown to be significant risk factor for the development of a number of adverse health conditions, including Type II diabetes and heart disease (National Heart, Lung, and Blood Institute, 1998). Further, body dissatisfaction has been found to lead to elevated rates of comorbid psychological disorders, such as social anxiety (Jarry & Berardi, 2004). Finally, both full-syndrome and sub-threshold eating disorders have been shown to lead to psychological distress and negative health correlates (Wilson et al., 2007). In fact, one study found women with full-syndrome and sub-threshold Binge Eating Disorder to experience no difference in consequences (Striegel-Moore et al., 2000). As a final point, if a woman is experiencing the consequences of one of these interrelated eating and weight concerns, she may be at risk for the consequences of one or both of the other two (Desai et al., 2008; Mond et al., 2007; Neumark-Sztainer et al. 2006).

**Definitions**

The following section will provide definitions for the eating and weight-related concerns (e.g., obesity, body dissatisfaction, and disordered eating) described in this paper. It will also define the terms used in later descriptions of intervention studies.

**Eating and weight-related concerns.** Definitions of obesity, body dissatisfaction, and disordered eating, including both eating disorders and subthreshold disordered eating behaviors, will be provided below.
**Obesity.** The term obesity refers to the condition of having a body mass index (BMI) of 30 or greater (Centers for Disease Control and Prevention (CDC), 2009). BMI is a measure of weight adjusted for height, and is used as an indicator of body fat and related health risks (CDC, 2009; Flegal, 2005).

**Body dissatisfaction.** Body dissatisfaction, also called negative body image, refers to negative attitudes about one’s shape and/or size. Although body image is a multi-faceted construct, it is most generally reflective of a negative evaluation or attitude about one’s body shape and weight.

**Disordered eating.** The term disordered eating is used in this paper to refer to a spectrum of eating pathology. Although the current system of diagnosing eating pathology in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2000) is categorical, several researchers have conceptualized eating concerns as existing on a continuum (Mintz et al., 1997; Tylka & Subich, 1999). Mintz et al. (1997) operationalized this continuum as individuals with no disordered eating behaviors on one end (e.g., labeled as asymptomatic), people with DSM-diagnosable eating disorders on the other (including Anorexia Nervosa (AN), Bulimia Nervosa (BN), and Eating Disorder Not Otherwise Specified (EDNOS) and people with a wide variety of milder disordered eating behaviors occupying the range in between. These latter individuals were labeled as “symptomatic.”

The term full-syndrome eating disorders is used in this paper to refer to the three DSM-diagnosable eating disorders, including Anorexia Nervosa (AN), Bulimia Nervosa (BN), and Eating Disorder Not Otherwise Specified (EDNOS). AN symptoms
include an extreme fear of gaining weight, a distorted perception of the body, and refusal to maintain a normal weight. BN is characterized by eating large amounts of food in discrete periods of time, engaging in inappropriate compensatory behaviors (e.g., vomiting, laxative use, excessive exercise, etc.), and a self-evaluation that is unduly determined by body shape and weight. Finally, EDNOS is given when a disorder does not meet all of the criteria of AN or BN, or the symptoms do not occur at a high enough frequency. Binge Eating Disorder, characterized by episodes of eating abnormally large amounts of food in discrete periods of time with a feeling of being out of control, is the most researched EDNOS diagnosis (Wilson et al., 2007). It is also the only EDNOS diagnosis to have its own specific diagnostic criteria, contained in an appendix of the DSM-IV.

The terms symptomatic eating disordered behaviors and sub-threshold eating disorders are used to describe eating pathology that does not meet DSM criteria for full-syndrome eating disorders, but that constitute symptoms of these disorders. These behaviors include, but are not limited to, chronic dieting, binge-dieting (e.g., switching between binging and dieting), and binge eating symptoms that do not meet the DSM criteria for BED (i.e., subthreshold BED).

**Intervention study terms.** There are typically two to three data points in an intervention study. In this paper, the term pre-intervention will be used to describe the assessment before the intervention. Post-intervention will refer to the data point directly after the intervention, and follow-up will refer to any assessment that is performed after the post-intervention data point.
Existing Interventions

Due to the significant prevalence and consequences of eating and weight-related concerns, numerous interventions have been created and evaluated to ameliorate them. However, these interventions have been limited in scope, targeted population, and/or in the amount of empirical support they have garnered.

First, in terms of their scope, the majority of these interventions are designed exclusively for the treatment of either obesity or full-syndrome eating disorders (Dingemans et al., 2002; Wilson et al., 2007). These narrow-focused interventions oversimplify the interrelated nature of eating and weight concerns. Although prevention efforts of the last decade have worked to broaden their programs by targeting obesity and eating disorders simultaneously, with body dissatisfaction as a targeted risk factor (Mintz et al., 2007; Neumark-Sztainer et al., 2006), intervention programs have failed to create similar holistic models of treatment. Further, the fact that the majority of eating pathology interventions target only full-syndrome eating disorders oversimplifies the wide-range of eating pathology that exists in the general population, including symptomatic eating disordered behaviors.

Pertaining to targeted population, many interventions for eating and weight-related concerns, particularly those for body dissatisfaction, have focused on student populations (e.g., college women or young girls), or homogeneous samples of young women (Agras et al., 2000(a), Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000(b); Fairburn, 2005; Jarry & Berardi, 2004; Shapiro et al., 2007), rather than women in the community with a wide-range of ages.
In addition, many of the traditional approaches focus almost exclusively on weight-loss through dieting, with the vast majority only leading to only short-term weight loss and eventual regain (Mann et al., 2007; Miller, 1999). Notably, an alternative approach, called Non-Diet or Health-At-Every-Size interventions, have been studied since the 1980’s (Hawks, Madanat, & Harris, 2004). While these have been significantly fewer in number than traditional approaches, they have demonstrated efficacy in helping individuals learn an unrestrained approach to eating and physical activity that is associated with positive psychological and physical health outcomes, other than weight loss (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). Further, although also few in number, some forms of the newer Mindfulness-based approaches to obesity treatment are gaining provisional support in helping individuals learn self-regulation of their eating and physical activity (Forman et al., 2009; Shelley, 2009; Tapper et al., 2008).

In reference to the empirical support for the full-syndrome eating disorder interventions, many are not efficacious for large subsections of their samples (Agras et al., 2000(a); Wilson et al., 2007) or have shown only preliminary effectiveness due to a dearth of studies on the intervention, as in the case of Mindfulness-based interventions for Bulimia Nervosa and Binge Eating Disorder (National Institute for Health and Clinical Excellence (NICE), 2004; Safer et al., 2001; Telch et al., 2001).

The following section will review the interventions for obesity, disordered eating, and body dissatisfaction that have been evaluated in the literature. Subsections will
highlight the Non-Diet or Health-At-Every-Size and Mindfulness-based interventions, as available, due to the influence of these approaches on the development of the current intervention.

**Obesity interventions.** This section will describe and contrast the effects of traditional, diet-based obesity treatment approaches and alternative treatment approaches (e.g., Non-Diet or Health-At-Every-Size and Mindfulness-based interventions). The traditional obesity treatment interventions generally include a focus on weight-loss through dieting and prescribed exercise regimens. Conversely, an alternative form of treatment, the Non-Diet or Health-At-Every-Size approaches, use an unrestrained, internally-focused approach to helping participants eat and move their bodies to achieve long-lasting health outcomes outside of weight-loss. In addition, Mindfulness-based interventions have also recently been utilized in obesity treatment due to the self-regulatory behavioral benefits of mindfulness. Adaptations of mindfulness-based interventions have been utilized as adjuncts to traditional weight-loss programs to increase adherence, and an original mindful eating program for weight loss has also been developed. These alternative forms of treatment will be highlighted, due to their influence in the development of the current intervention. However, while the full body of this research will be summarized here, each of the Non-Diet or Health-At-Every-Size interventions, as well as the aforementioned, original mindful eating intervention for the treatment of obesity, will be discussed in more detail later in this paper when the *Eat for Life* intervention is described, due to their particular theoretical significance for the development of the intervention.
**Traditional obesity treatment approaches.** In response to the obesity epidemic, public health officials have recommended weight-loss through a combination of calorie restrictive dieting, physical activity programs, and behavioral therapy to increase adherence to the diet and exercise regimen (National Heart, Lung, and Blood Institute, 1998; McTigue et al., 2003). However, many of these programs produce only moderate, temporary weight loss and may contribute to adverse health consequences associated with weight cycling (i.e. repeated loss and regaining of weight) (Mann et al., 2007; Miller, 1999). A recent, large-scale randomized trial evaluated the efficacy of a variety of two-year weight-loss diet programs on a community sample of obese subjects. Each of the programs included intensive weekly group and individual counseling sessions that encouraged adherence to the diet program and increased physical activity. While the results demonstrated an initial decrease in weight, all groups began to regain body weight by 12 months; and at two years, participants were continuing to regain weight (Sacks et al., 2009). These finding suggest that participants may have regained their original weight had treatment continued (Katan, 2009). In addition, a recent meta-analysis of randomized controlled trials and long-term studies of weight-loss diet programs found that of the 31 long-term studies, participants gained back the majority of the weight by long-term follow-up; and in eight of the studies, participants weighed more at follow-up than they had at baseline (Mann et al., 2007). The conclusion gleaned from such research is often that interventions that target weight loss and dieting don’t work to alleviate or decrease obesity.
**Non-Diet and Health-At-Every-Size obesity treatment interventions.** Due to such conclusions about the unsustainable nature of traditional diet programs, a shift from a “weight-centered” approach to a more “health-centered” approach to the treatment of obesity has been recommended (Provencher et al., 2009, p. 1855). Proponents of this movement assert that focusing on weight loss through dietary restraint can result in feelings of failure and low self-esteem, increased body preoccupation, a strengthened diet/binge cycle, and detrimental health effects associated with weight cycling (Bacon et al., 2002; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995). As an alternative, a group of non-weight-centered approaches, called Non-Diet and Health-at-Every-Size (HAES) interventions, have been created and evaluated. While there are differences in their approaches, these interventions share the following attributes: active advocacy of body size and self-acceptance, teaching participants to adopt an unrestricted and non-diet method of eating based on internal hunger and satiety cues, and encouragement of moderate physical activity that is enjoyable and sustainable (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989).

Six Non-Diet or Health-At-Every-Size (HAES) interventions that fit the above description have been developed and evaluated in the literature (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). All of these interventions were administered in a group format and ranged from 10 weeks to 24 weeks in length. A primary outcome of each of the interventions was a significant
decrease in cognitive restraint and food preoccupation associated with dieting and an increase in eating based on internal hunger and satiety cues (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). These changes were demonstrated from pre- to post-intervention (Ciliska, 1998; Provencher et al., 2007; Roughan et al., 1990), as well as over longer-term follow-ups, ranging from one to three years in length (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Omichinski & Harrison, 1995; Provencher et al., 2009). In addition, of the intervention studies that tested for other psychological outcomes (i.e., all but one intervention), each contributed to increases in body acceptance and/or self-acceptance (Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Roughan et al., 1989). Additionally, of the four studies that included depression as an outcome variable, each of them led to significant decreases in depressive symptoms (Bacon et al., 2002; Bacon et al., 2005; Ciliska, 1998; Roughan et al., 1989). Of the three studies that assessed for physical activity levels, one study found no significant improvements in energy expenditure over a one-year follow-up (Provencher et al., 2007), while the other two studies found that participants increased their energy expenditure through post-test and over two and three-year follow-ups (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994). Further, while weight-loss is not a primary outcome measure for Non-Diet and HAES studies, one study found participants in the HAES intervention to maintain their weight throughout a two-year follow-up period, whereas participants in the comparison condition (e.g., a traditional diet program) lost weight and then regained it to the point
of their initial loss being non-significant at follow-up. Additionally, while participants in both conditions demonstrated an initial decrease in LDL cholesterol levels, only participants in the HAES condition maintained their improvements at follow-up (Bacon et al., 2002; Bacon et al., 2005). Finally, another study that measured weight loss demonstrated a modest (e.g., approximately seven pounds) but sustained amount of weight loss in participants over a two year period (Roughan et al., 1989).

In conclusion, there appears to be preliminary evidence for an alternative to the traditional diet-focused obesity treatments in the Non-Diet and Health-At-Every-Size approaches. These interventions seem to be efficacious in decreasing externally-oriented eating (e.g., eating based on rules associated with dieting) over both the short and long-term. This finding is significant, in that eating based on restrictive diet programs has been repeatedly been found to be unsustainable. Further, these interventions also contribute to other positive outcomes that are associated with health and well-being, besides weight or body mass index (BMI), including a decrease in body dissatisfaction, increase in self-esteem, and sustained improvements in cholesterol and physical activity. As these interventions were influential in the development of the current intervention, they will be discussed again in more detail later in this literature review.

**Mindfulness-based obesity treatment approaches.** Another alternative to traditional obesity treatment are Mindfulness-based approaches. As with the Health-at-Every-Size approaches, these interventions encourage bringing awareness to one’s reasons for eating (i.e., internal hunger or emotional/external reasons) (Baer et al.,
2006). However, unlike HAES interventions, they focus on weight loss as a major outcome variable and are at times administered along with traditional weight loss programs to help maintain adherence to the program. Further, these interventions are more varied in their approaches than HAES interventions and represent various forms of mindfulness-based therapy. These forms include adaptations of Acceptance and Commitment Therapy (ACT) (Hayes et al., 1999) for the treatment of obesity, as well as an original mindful eating program for obese individuals, called the Mindful Eating and Living program (MEAL) (Shelley, 2009). Broadly, the overarching premise of incorporating mindfulness into obesity treatments is to increase the likelihood that individuals can become aware of their triggers for overeating and eating based on external cues (e.g., emotional or external eating) and thus learn to self-regulate, thereby promoting weight loss (Forman et al., 2009; Shelley, 2009; Tapper et al., 2008).

Two ACT interventions have been created and evaluated as supplements to individuals’ traditional weight-loss diets (Forman et al., 2009; Tapper et al., 2008) and one complete mindful eating program (MEAL) has been evaluated in the literature (Shelley, 2009). Cumulatively, the results of these studies point to mixed results for the use of mindfulness-based interventions in promoting weight-loss and related health correlates (Forman et al., 2009; Shelley, 2009; Tapper et al., 2008). However, it is worthy to note briefly that while Acceptance and Commitment Therapy is based on mindfulness principles, it does not use actual mindfulness meditation training in the intervention (Hayes et al., 1999). Conversely, the MEAL program is grounded in mindfulness through meditation practices (Shelley, 2009). Hence, as these mindfulness-based interventions
are so varied in their approaches and prominence of mindfulness, it is difficult to draw general conclusions from these three studies as to the effectiveness of mindfulness training in obesity treatment. As such, although each of the three interventions will be described here, the MEAL program will be summarized and highlighted more in depth later in this paper, due to the prominence of mindfulness in this program and its influence on the *Eat for Life* intervention.

One randomized controlled trial and one uncontrolled study of weight loss programs that incorporated an Acceptance and Commitment Therapy (ACT) (Hayes et al., 1999) component have been published (Forman et al., 2009; Tapper et al., 2008). Both of these studies administered ACT workshops as supplements to participants’ traditional weight loss programs.

In the randomized controlled trial, 62 women who were attempting to lose weight were randomized to the treatment condition, where they could attend up to three, two-hour ACT workshops and a follow-up session, or to the control condition where they continued their normal diet programs (Tapper et al., 2008). The workshops included ACT concepts and exercises specifically adapted to the issue of weight loss. These included a discussion of participants’ values to increase clients’ motivation to lose weight, cognitive diffusion exercises (e.g., helping participants to separate thoughts from behavior), and acceptance exercises, to help participants learn to tolerate negative emotions. Participants were measured at pre-intervention, post-intervention (e.g., four months), and at six month follow-up for levels of emotional and binge eating, physical activity, BMI, and cognitive flexibility. At the six-month post-intervention assessment,
participants in the ACT intervention demonstrated significantly greater increases in physical activity than those in the control group, but no significant differences in weight or mental health indices (e.g., emotional eating).

In the uncontrolled trial, a 12-week intervention that combined an ACT component with a standard behavioral weight-loss program was administered to a sample of 29 obese women (Forman et al., 2009). The ACT component included weekly 1-hour sessions of discussion and exercises related to values and commitment enhancement, distress tolerance, and mindfulness. The mindfulness section did not include mindfulness meditation training, but encouraged clients to ask themselves the reasons for their eating before they consumed food. The weight-loss program was based on the LEARN program (Brownell, 2004), that includes a focus on decreasing caloric consumption and increasing physical activity. Participants were administered measures of emotional eating, restraint (e.g., dieting behaviors), mindfulness, motivation, and quality of life at pre- and post-intervention, as well as at six-month follow-up. At post-intervention, participants collectively demonstrated an average weight loss of 6.6% (e.g., 13.67 pounds) and at six-month follow-up, they had lost an average of 9.6% (e.g., 18.73 pounds). As the authors did not conduct formal mediation analyses, it is unable to be determined if the ACT components helped participants to lose weight, or if it was solely the diet component of the intervention. However, participants’ scores on all but one of the dependent measures (i.e., motivation) changed significantly in the expected direction (e.g., at post-intervention and follow-up, with moderate to large effect sizes that ranged from $d = .82$ to 1.47). As such, the authors
tentatively suggested that these changes may have supported participants’ weight loss; however, due to their lack of actual analyses, these conclusions cannot be supported at this time. Interestingly, although the intervention did not include formal mindfulness meditation, participants’ scores on the mindfulness measure increased significantly and with a moderate-to-large effect size (d = .78).

An original mindfulness-based program for obesity treatment, the Mindful Eating and Living (MEAL) program, appears to have resulted in somewhat more robust findings than the ACT-adapted interventions (Shelley, 2009). In a randomized controlled trial, a sample of 40 postmenopausal obese women were randomized to either the MEAL program or a traditional weight loss program (i.e., the active control condition). While both groups lost a similar amount of weight at six-week post-intervention and sustained a weight loss of 10 to 12 pounds at one year follow-up, the women in the MEAL program exhibited larger effect sizes and greater reduction in health risk factors, such as waist-to-hip ratio and C-reactive protein.

In sum, two Acceptance and Commitment Therapy (ACT) weight-loss interventions demonstrated mixed results as to their efficacy in promoting weight loss and positive behavior change (Forman et al., 2009; Tapper et al., 2007), while an original mindful eating program, the Mindful Eating and Living Program (MEAL), demonstrated more robust findings as to its efficacy in leading to sustained weight loss and other improved health correlates (Shelley, 2009). While both forms of interventions require further study to draw substantial conclusions, the combined results of these interventions point to the usefulness of incorporating an ACT component into
traditional weight loss programs as being debatable, but that a more holistic mindful eating program may be a promising alternative to traditional weight-loss programs. As this latter original mindful eating program was influential in the development of the current program, it will be described again below.

**Eating disorder interventions.** The following section will review intervention studies for full-syndrome Anorexia Nervosa (AN), Bulimia Nervosa (BN), and Binge Eating Disorder (BED). It will also review one available study of an intervention for subthreshold BED symptoms and one study for both full-syndrome eating disorders and sub-threshold disordered eating behaviors. Mindfulness-based treatment programs for each of these eating disorders or subthreshold disordered eating behaviors will be highlighted, as some of these influenced the development of the *Eat for Life* intervention. These influential studies will be summarized here and discussed in more detail later in this review.

**Anorexia Nervosa interventions.** Although Anorexia Nervosa is widely considered a serious, life-threatening disorder, there have been surprisingly few treatment studies of AN in either adolescents or adults (Fairburn, 2005; Wilson et al., 2007). Over the past two decades, only 15 controlled trials have been conducted (Wilson et al., 2007). The majority of these studies are of Cognitive Behavioral therapy interventions, which have demonstrated little efficacy. Four of the studies that compared CBT interventions with active control conditions, such as family psychotherapy, found no significant differences between the groups. The remainder of the studies could not be interpreted due to weak comparison conditions (Fairburn,
Nevertheless, due to a low prevalence of AN among adult community women, as well as the complexity and life-threatening nature of this disorder, the *Eat for Life* intervention did not target this disorder.

**Bulimia nervosa interventions.** As compared with Anorexia Nervosa, the treatment literature for Bulimia Nervosa is significantly more promising. Cognitive behavioral (CBT) interventions are largely considered the most efficacious in reducing BN symptoms (Wilson et al., 2007; Shapiro et al., 2007). Indeed, a manualized cognitive-behavioral therapy program (CBT-BN; Fairburn et al., 1993) is recommended by the National Institute for Health and Clinical Excellence (NICE) as the treatment of choice for BN, followed by Interpersonal Therapy (IPT) for those individuals who do not respond to CBT-BN (NICE, 2004). Comparison studies of individually-administered CBT and Interpersonal Therapy (IPT) have found CBT to lead to greater decreases in restraint, vomiting, and binge eating at post-intervention in outpatient samples of young women (Mean age = 28.1 and 24.2, respectively; Agras et al., 2000(a); Fairburn et al., 1991). Notably, both studies found no significant differences between CBT and IPT at follow-up; nevertheless, CBT is largely considered to be more efficient in decreasing BN symptomology (NICE, 2004; Shapiro et al., 2007). Notably, however, CBT treatment has been found to be effective in reducing binge eating and purging in only 30-50% of patients (Agras et al., 2000(a); Wilson et al., 2007). Again, however, due to both the low prevalence of this disorder in adult women and the complexity of the disorder, it was not a focus of the *Eat for Life* Intervention. Still, Mindfulness-based interventions for this disorder are worthy of discussion.
Mindfulness-based Bulimia Nervosa interventions. A newer line of research is utilizing a mindfulness-based intervention, Dialectical Behavior Therapy (DBT; Linehan, 1999), in the treatment of Bulimia Nervosa (Safer et al., 2001). Like Acceptance and Commitment Therapy, DBT was not initially created to treat eating pathology. Rather, DBT was designed to treat individuals with Borderline Personality Disorder (Linehan, 1999). Further, also like ACT, DBT does not incorporate mindfulness meditation training in the intervention, but uses mindfulness concepts and exercises (Linehan, 1999). The authors of the DBT model for the treatment of eating pathology hypothesize that individuals with BN binge and purge due to difficulties with affect regulation (Safer et al., 2001). As such, the adapted intervention for BN helps individuals learn to notice their triggers for binge eating and purging and manage their emotions in alternative ways. In a randomized controlled trial, a sample of 31 young women with BN (Mean age = 34 years) were assigned to either a 20-week DBT group intervention or a wait-list control group. Participants were measured at pre- and post-intervention on measures of binge eating and purging, emotional eating, self-esteem, personality, depression and anxiety. No measures of mindfulness were administered in this study. At post-intervention, it was found that the women in the DBT group significantly decreased their binge and purge behaviors as compared to wait-list controls.

Binge Eating Disorder and subthreshold BED interventions. As with Bulimia Nervosa, Cognitive behavioral treatments are the most tested interventions in the treatment of Binge Eating Disorder. Nevertheless, the evidence for the effectiveness of CBT in treating BED is limited, due to small sample sizes, high drop-out rates, and few
well-controlled trials (Brownley, Berkman, Sedway, Lohr, & Bulik, 2007; Wilson et al., 2007). The cognitive behavioral manualized treatment used for BN has been adapted to BED (CBT-BED; Fairburn et al., 1993) and is recommended by the National Institute for Health and Clinical Excellence (NICE). However, the NICE (2004) guidelines also recommend the use of Interpersonal Therapy (IPT) and Dialectical Behavior Therapy (DBT) as viable alternatives. Indeed, both IPT and CBT lead to greater reductions in BED symptoms, as compared to wait-list controls (Wilson et al., 2007). Further, a recent large-scale randomized controlled trial of 20 weeks of group-administered IPT and CBT demonstrated essentially identical reductions in binge eating, dietary restraint, psychological distress, and interpersonal functioning, with both having remission rates above 70% through a 12 month follow-up in a sample of 162 overweight men and women (Wilfley et al., 2002).

**Mindfulness-based interventions for Binge Eating Disorder and subthreshold binge eating behaviors.** Mindfulness-based interventions are increasingly being used in the treatment of full-syndrome and sub-threshold Binge Eating Disorder. These include Dialectical Behavior Therapy (Linehan, 1999) adapted for BED (Telch et al., 2001), the Mindfulness-based Stress Reduction program (Kabat-Zinn, 1982) adapted for subthreshold binge eating behaviors (Smith et al., 2006), an original mindful eating program for BED called Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999), and Minfulness-based Cognitive Therapy adapted for full-syndrome and sub-threshold Binge Eating Disorder (Segal et al., 2002). Cumulatively,
these programs have demonstrated preliminary efficacy in treating both full-syndrome and subthreshold Binge Eating Disorder.

A randomized controlled trial of a DBT intervention was adapted for the treatment of Binge Eating Disorder (Telch et al., 2001). As mentioned previously in the description of the DBT intervention for BN (Safer et al., 2001), DBT does not include mindfulness meditation training, but uses mindfulness concepts for purposes of emotion regulation training (Linehan, 1999). Further, like the previously mentioned DBT intervention for Bulimia Nervosa, the intervention conceptualizes eating pathology as a means of regulating emotions. As such, the 20-week group intervention helps participants to notice their triggers for overeating and replace the behavior with more adaptive coping skills. Twenty-two women with full-syndrome BED were randomly assigned to the DBT group or a wait-list control group. Participants were measured at pre- and post-intervention, as well as at three and six-month follow-up on measures of binge eating, depression, self-esteem, mood, and BMI. Results demonstrated significant decreases in binge eating and concerns about eating in the intervention group as compared to a wait-list control group through a six-month follow-up (i.e., remission rates of 56%). However, it was unclear what was helpful about the intervention, as intervention group participants’ scores on measures of negative affect and depressed mood were not significantly decreased.

The other three mindfulness-based treatments in which mindfulness is a more central component (as compared to Dialectical Behavior Therapy (DBT) and Acceptance and Commitment Therapy (ACT)) are worthy of highlighting, due to their influence on
the creation of the *Eat for Life* intervention. Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999) is an intervention designed to treat BED that is loosely based on Mindfulness-Based Stress Reduction (MBSR) developed by Kabat-Zinn (1982). The program is a six-week group intervention that includes mindfulness meditations, mini-meditations, and eating meditations. In a non-randomized study of 21 women with BED (Kristeller & Hallett, 1999), participants were found to decrease the frequency and intensity of binge eating, improve their attitudes towards eating, and decrease depression and anxiety. These results were stable over a three week follow-up. No significant changes in weight were reported.

Another intervention modified an eight week MBSR course (Kabat-Zinn, 1982) to focus on reducing participants’ levels of subthreshold binge eating behaviors (Smith et al., 2006). However, because participants were not recruited due to having eating concerns, more than half demonstrated no binge eating and the other half demonstrated mild to serious binge eating behaviors. Results indicated that the 12 participants with binge eating displayed moderate to large decreases in binge eating. Further, while increases in mindfulness were not associated with changes in symptomology, increased self-acceptance and decreased anxiety was associated with changes in binge eating. The authors cite the small sample size of the study as contributing to the lack of effect associated with mindfulness.

Finally, Mindfulness-based Cognitive Therapy (MBCT; Segal et al., 2002) is also a modification of MBSR that was adapted for the treatment of depression. In a non-controlled pilot study, MBCT was adapted for the treatment of binge eating and
administered to a sample of ten women with both full-syndrome and sub-threshold Binge Eating Disorder (Baer et al., 2006). Results of this study were mixed. Specifically, participants in the program demonstrated decreases in frequency of objective binge episodes (e.g., binge episodes that fit criteria outlined by experts) and scores on a binge eating instrument, as well as made improvements on eating and weight concerns, levels of mindfulness, and depressive symptoms. However, participants also increased their numbers of subjective binge episodes (e.g., what the participants idiosyncratically labeled a binge) and demonstrated increased weight concerns.

In sum, it appears that these four studies of mindfulness-based interventions point to preliminary support for their efficacy in treating Binge Eating Disorder and subthreshold binge eating behaviors. Importantly, as the three interventions with mindfulness as a more central component (compared to DBT and ACT interventions) were not controlled, had small sample sizes, and demonstrated some inconsistent results, they point to the need for further studies of mindfulness interventions for the treatment of binge eating behaviors. These latter interventions will be described again in more detail below in relation to the development of the current, Eat for Life intervention.

**Body dissatisfaction.** As negative body image is a risk and maintenance factor for eating pathology (Stice, 2002), as well as a symptom of Anorexia Nervosa and Bulimia Nervosa, interventions that target body dissatisfaction are often imbedded within eating disorder prevention and treatment programs. One eating disorder (ED) prevention intervention, the Cognitive Dissonance (CD) approach, is designed to decrease body
dissatisfaction, dieting, and negative affect through the reduction of internalization of
the thin-ideal, which is then hypothesized to decrease bulimic symptomology. In several
randomized controlled trials, the CD approach has been shown to be effective in
reducing thin ideal internalization and body dissatisfaction in samples of college-aged
women and adolescent girls (Stice, Shaw, Burton, & Wade, 2006; Stice, Chase, Stormer,

As with the ED prevention intervention mentioned above, in eating disorder
intervention studies, the cognitive behavioral approaches also incorporate a component
of reducing body dissatisfaction and over-evaluation of participants’ weight or shape.
Indeed, in the CBT-BN approach (Fairburn et al., 1993), over-evaluation of shape and
weight is considered to be central to the maintenance of bulimia nervosa. The centrality
of body dissatisfaction in bulimia nervosa is supported by two studies in which
behavioral versions of CBT-BN that did not address over-evaluation of shape and weight
led to increased risk of relapse as compared to the full treatment (Cooper & Steere,
1995; Fairburn, Jones, Peveler, Hope, & O’Conner, 1993).

In addition to these ED intervention and prevention interventions in which body
image improvement is embedded in the intervention, there are several studies that
have evaluated stand-alone body image treatments. The vast majorities of these
interventions utilize principles of cognitive behavioral therapy and include components
such as self-monitoring, cognitive restructuring, psychoeducation, and exposure and
response prevention (Jarry & Ip, 2005). A recent review of 18 of these stand-alone CBT
body image interventions found them to be highly effective in reducing body
dissatisfaction and associated correlates (e.g., depression, anxiety, eating symptomology), with the majority of the samples consisting of non-eating disordered college women (Jarry & Berardi, 2004). To date, no mindfulness-based programs have been evaluated for their efficacy in improving body-image.

**The Need for a More Inclusive Intervention**

As noted earlier, adult women in the United States demonstrate a range of problematic relationships with food and their bodies. Indeed, adult women in the U.S. can be said to suffer from “normative discontent” (Rodin et al., p. 267) with their bodies and eating. However, to date, the current literature does not meet the needs of community women who need assistance with diverse, but related, concerns. Rather, the current literature focuses primarily on homogeneous samples of eating disordered (Fairburn, 2005; Kristeller & Hallett, 1999; Shapiro et al., 2007, Safer et al., 2001; Telch et al., 2001); obese (Forman et al., 2009; Provencher et al., 2007; Provencher et al., 2009; Sacks et al., 2009; Shelley, 2009; Tapper et al., 2008), college students (Jarry & Berardi, 2004) and/or young women (Agras et al., 2000(a); Agras et al., 2000(b), Fairburn et al., 1991; Shapiro et al., 2007), with interventions focusing on one problem (e.g., eating disorder, obesity) at a time.

A new, more inclusive intervention is needed to simultaneously target the range of concerns that adult community women experience (i.e., body dissatisfaction, obesity, overweight, disordered eating). More specifically, such an intervention would ideally be able to simultaneously assist a heterogeneous community sample of women, suffering with a range of concerns related to food, body image and eating.
Such an intervention would be both cost-effective and convenient to administer in a variety of treatment settings. The intervention could be targeted to the community without pre-screening for a specific set of diagnostic criteria, which is often time-consuming and costly. Indeed, the intervention could be administered with confidence that numerous women who wish to participate in the intervention could be assisted.

Notably, an innovative theory has been developed that ties the normative problems of body dissatisfaction, disordered eating and obesity together, linking them to a common cause. This theory is the Intuitive Eating Theory (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995). Additionally, as previously described, the practice of Mindfulness has begun to be used with a range of eating and weight concerns (Kristeller, Baer, & Quillian-Wolever, 2006). Together, these formed the foundation of the intervention examined in this study and thus, the following section will further describe these holistic approaches to helping people to re-learn positive relationships with food and their bodies.

**Intuitive Eating**

**Background and theoretical framework.** The Intuitive Eating theory was born out of the anti-dieting movement that began in the 1980’s (Hawks et al., 2005; Hawks et al., 2004). The movement away from dieting developed out of growing concern that restrictive diet programs were not helping people to lose weight over the long-term and instead, were leading to further problems, such as weight cycling, dysfunctional relationships with food, and psychological distress (Gast & Hawks, 1998; Hawks et al., 2004). Indeed, a line of research emerged that documented that dieting contributed to
a higher propensity for emotional and binge eating and an unhealthy preoccupation with food (Polivy & Herman, 1985, 1999; Wilson et al., 1993). Several interventions were then developed to help chronic dieters to give up dieting and develop a non-dieting (Cileska, 1990), normal (Polivy & Herman, 1992), or demand feeding (Carrier et al., 1994) eating style, based on eating in response to internal hunger cues and stopping in response to satiety cues. Further, several popular self-help books were published that pointed to people’s natural ability or inner wisdom to eat in a way that promoted their well-being and natural weight (Hansen & Goodman, 1999; Hirschmann & Munter, 1989; Podjasek & Carney, 1998; Schwartz, 1996). This internally-driven eating style was popularized as intuitive eating by two nutritionists, Evelyn Tribole and Ellen Resch, who created a ten step program to re-learning intuitive eating, based on their work with clients. The approach was published in their 1995 self-help book Intuitive Eating: A Recovery Book for the Chronic Dieter (now titled, Intuitive eating: A Revolutionary Program that Works in its second edition). Psychologists and health educators have since created measures of intuitive eating; two such measures exist, both titled the Intuitive Eating Scale (IES; Hawks et al., 2004; IES; Tylka, 2006). The developers of these scales have also conducted research on the benefits of an intuitive eating style (Hawks et al., 2005; Smith & Hawks, 2006; Tylka & Wilcox, 2006). Other theoretical articles that advocate for an intuitive eating approach to be used in health education have also been published in the literature (Gast & Hawks, 1998, 2000).

The central tenant in the theory of Intuitive Eating is that people become overweight, have disordered eating patterns, and dislike their bodies because they learn
to eat and experience their bodies based on external rather than internal cues. This theory postulates that while people are born as intuitive eaters with the ability to internally regulate their eating and movement, they become separated from that ability due to living in a culture of dieting and over-emphasis on weight and shape (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995).

First, regarding eating behavior, Intuitive Eating theorists suggest that people eat for three main reasons: physiological, environmental, and emotional. The assertion is that the ideal reason to eat is for physiological reasons, or because of physical hunger (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995). However, they suggest that many individuals frequently eat because of environmental reasons (e.g., when food is available) and emotional reasons (e.g., to numb themselves from anxiety or boredom). These latter two reasons are thought to lead to the consumption of calories that the body does not need (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995).

Intuitive Eating theorists suggest that restrictive diet programs, which tell consumers what, when, and how much to eat, encourage eating for non-physiological reasons and thus result in disordered eating behaviors (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995). Indeed, these theorists strongly assert that diet programs do not work over the long-term because they encourage restriction, which often leads to overeating when food is available (e.g., environmental reasons). The theory also suggests that a dysfunctional relationship with food is set up because so-called bad foods on the diet program gain elevated status, leading dieters to be more likely to binge due to distress (e.g., emotional eating; Gast & Hawks, 1998, 2000; Tribole &
Resch, 1995). The authors cite the aforementioned research on the relationship between dieting and binge eating/emotional eating to support these claims (Polivy & Herman, 1985, 1999; Wilson et al., 1993).

Further, the Intuitive Eating theorists suggest a similar dysfunctional relationship is set up with physical activity. When people begin pre-packaged exercise programs that they dislike because they desire to lose weight, they lose touch with how good it feels internally for the body to move. They are then more likely to stop the exercise program, feel guilty, and lose self-efficacy around being a person who moves their body (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995).

The authors of Intuitive Eating also assert that living in a diet culture that values thinness as the ideal contributes to body dissatisfaction (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995). The theorists encourage focusing on how the body feels internally, rather than how it looks externally; they encourage ceasing to compare oneself to outside ideals. The theory asserts that if individuals can value their bodies now, rather than after weight loss, they will be more likely to treat their bodies well and refrain from starving and over-feeding them (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995).

In sum, the authors of Intuitive Eating Theory suggest that if individuals can re-learn how to eat based on internal hunger and satiety cues, move their bodies because it feels good, and appreciate their bodies for how they feel and what they do for them, individuals can develop a positive, sustainable relationship with food and their bodies.
Measurement. Two instruments have been created to assess an intuitive eating style (IES; Hawks et al., 2004; IES; Tylka, 2006). While the instruments share the same title, they measure different constructs related to intuitive eating. Specifically, the four subscales of the IES developed by Hawks et al. (2004) are based on a review of several self-help books that were published in the 1980’s and 1990’s that described how to reject dieting and eat based on internal cues (Hansen & Goodman, 1999; Hirschmann & Munter, 1989; Podjasek & Carney, 1998; Schwartz, 1996; Tribole & Resch, 1996). Although this review includes Tribole and Resch’s (1995) book, it also includes four additional books, such as *Diets Don’t Work* (Schwartz, 1996) and *The Ten Habits of Naturally Slim People: And How to Make them a Part of Your Life* (Podjasek & Carney, 1998). Conversely, Tylka (2006) based the three subscales of her Intuitive Eating Scale (IES) solely on the three central features of intuitive eating outlined in Tribole and Resch’s (1995) book.

Hawks et al. (2004) included four subscales in their 30-item Intuitive Eating Scale (IES). These include Intrinsic Eating (i.e. eating based on internal cues), Extrinsic Eating (i.e. eating based on external cues, such as emotional eating), Anti-Dieting (i.e. a sentiment that rejects dieting), and Self-Care (i.e. an orientation that favors health over external beauty). The scale was initially validated with a sample of 391 undergraduate men and women. As expected, each of the subscales, except for self-care, was significantly higher for individuals without an eating disorder and for those with the lowest levels of dieting. Further, although obese individuals scored higher on one of the subscales (i.e. Intrinsic Eating) than those who were normal weight, normal weight
individuals scored significantly higher on the total IES than overweight or obese individuals.

Tylka (2006) included three subscales in her Intuitive Eating Scale: (a) unconditional permission to eat when hungry and what food is desired, hereafter Permission; (b) eating for physical rather than emotional reasons, hereafter Physical; and (c) reliance on internal hunger and satiety cues to determine when and how much to eat, hereafter Reliance (p. 226). Using a sample of 1,260 undergraduate women, scores on the IES were correlated with measures of body dissatisfaction, eating behaviors, and other psychological constructs. Consistent with Tribole & Resch’s (1995) theory, the study found that scores on the IES were positively related to measures of self-esteem, coping, and optimism, and negatively related to eating disorder symptomology, pressure for thinness, body dissatisfaction, internalization of the thin ideal, and poor interoceptive awareness. The study also found that high scorers on the IES had significantly lower BMIs.

Notably, as the latter Intuitive Eating Scale (Tylka, 2006) was based upon the Tribole and Resch (1995) model that was used in the Eat for Life intervention, this version of the IES is included as a dependent measure in the current study.

**Empirical support.** Two correlational studies have been carried out on the intuitive eating style, which support a relationship between intuitive eating and a number of positive health outcomes (Hawks et al., 2005; Smith & Hawks, 2006). Further, components of intuitive eating have been shown to both be uniquely related to
psychological well-being and to constitute a lack of eating disorder (ED) symptomology (Tylka & Wilcox, 2006). These studies are described in more detail below.

Hawks et al. (2005) looked at the relationship between intuitive eating and a variety of health indicators among a sample of 32 college women. The authors found that women who scored higher on the IES had significantly lower BMIs. They also found that women who scored higher on the IES had higher HDLs (high density lipoproteins) and lower triglycerides. Among the subscales of the IES, the Anti-Dieting subscale (i.e., high scores indicate the person does not diet) and Extrinsic subscale (i.e., high scores indicating that the person seldom eats for non-physiological reasons) had the strongest relationships with the health indicators, including BMI, HDL levels, and cardiovascular risk.

Smith and Hawks (2006) evaluated the relationship between intuitive eating and nutritional choices among a sample of 343 college men and women. This study was an effort to answer the question of whether the intuitive eating model’s unconditional permission to eat results in poor food choices. As in the previous study, there was a significant relationship between a higher score on the IES (Hawks et al., 2004) and lower BMI values in both men and women. Further, for both genders, there was no indication that intuitive eating was associated with poorer food choices and some indication that it was associated with healthier choices. Specifically, intuitive eating was associated with taking more pleasure in food, eating a more diverse diet, and eating breakfast (although eating breakfast was an indirect association).
Finally, Tylka and Wilcox (2006) examined whether intuitive eating was distinct from eating disorder (ED) symptomology among a sample of college women. To do this, they assessed whether intuitive eating was a unique predictor of various constructs associated with psychological well-being, after controlling for ED symptoms. As ED symptoms have been found to be negatively associated with psychological well-being, the authors theorized that if intuitive eating contributed to unique variance in these well-being constructs, it could be determined that intuitive eating was distinct from ED symptomology. In both studies, the Physical subscale and Reliance subscale of the IES (Tylka, 2006), eating for physical rather than emotional reasons and reliance on hunger/satiety cues, were found to make unique contributions to all of the well-being measures, including positive affect, self-esteem, proactive coping, optimism, unconditional self-regard, psychological hardiness, and social problem solving. Conversely, the Permission subscale did not make unique contributions to any of the measures, except for positive affect, as this subscale and ED symptomology were strongly related. As such, it was determined that intuitive eating is both distinct from and related to ED symptoms, as well as strongly related to psychological well-being.

In sum, these correlational studies provide preliminary evidence of an intuitive eating style being an adaptive way to eat. Indeed, people who score higher on intuitive eating seem to demonstrate a number of beneficial psychological and physical health correlates.

The need for intervention research. To date, no studies have been published that test the efficacy of Tribole and Resch’s Intuitive Eating approach. However, there
have been several studies that have tested the effectiveness of interventions that include an intuitive eating component. These interventions are called Non-Diet or Healthy-at-Every-Size approaches (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Ominchinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). Like the intuitive eating approach, the Non-Diet and Health-at-Every-Size approaches to the treatment of obesity, mentioned above, advocate reducing the restriction associated with dieting and instead, eating based on internal hunger and satiety cues. Further, as in Tribole and Resch’s (1995) model, the Non-Diet or Health-At-Every-Size approaches also include a focus on body and/or self-acceptance and encourage incorporating enjoyable physical activity into daily routines (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Ominchinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989).

Six of these Non-Diet or Health-At-Every-Size (HAES) interventions have been evaluated in the literature to-date. As they cumulatively influenced the conceptual development of the *Eat for Life* intervention, each of them will be described in detail here. They will be organized according to rigor of methodology, with controlled studies being discussed in detail first (Bacon et al., 2002; Bacon et al., 2005; Provencher et al., 2007; Provencher et al., 2009; Ciliska, 1998), followed by uncontrolled studies (Carrier et al., 1994; Ominchinski & Harrison, 1995; Roughan et al., 1989). The latter studies will then be organized according to length of assessment, with long-term studies (Carrier et al., 1994; Roughan et al., 1989), followed by a short-term study (Ominchinski & Harrison, 1995).
Randomized controlled trials of three Non-Diet and Health-at-Every-Size interventions have been conducted (Bacon et al., 2002; Bacon et al., 2005; Ciliska, 1998; Provencher et al., 2007; Provencher et al., 2009). Two of these long-term studies (described in four papers) compared their non-diet interventions to active control groups (e.g., a Social Support group) (Provencher et al., 2007; Provencher et al., 2009) and a traditional diet program (Bacon et al., 2002; Bacon et al., 2005) and did follow-up assessments (e.g., one and two-year follow-ups, respectively). The third study compared two forms of the intervention (e.g., a psychoeducational and educational group) with a wait-list control and examined only pre- and post-intervention effects (Ciliska, 1998). The findings of these studies are similar in that they each report that participants in the HAES intervention demonstrated decreased restraint (e.g., restricted eating; Bacon et al., 2002; Bacon et al., 2005; Ciliska, 1998; Provencher et al., 2007; Provencher et al., 2009), with two of the studies also leading to decreases in disinhibition (e.g., loss of control over eating; Bacon et al., 2002; Bacon et al., 2005; Provencher et al., 2007; Provencher et al., 2009). However, in one these latter studies, these improvements were equivalent to the active control group at follow-up (Provencher et al., 2009). The following will describe these studies in detail.

The first intervention, formerly called a Non-Diet intervention (Bacon et al., 2002), now entitled Health-At-Every-Size to reflect current language in the literature, is an original, non-diet wellness program that is designed for obese, chronic dieters (Bacon et al., 2005). The goal of the intervention, rather than to help individuals lose weight, is to help them to increase their body acceptance and improve health behaviors,
regardless of their BMI. As such, the intervention teaches active size acceptance through helping individuals to separate their body size from their self-worth. Next, it teaches participants to decrease restrictive dieting behaviors and to learn internally-regulated eating patterns, including a focus on eating nutritious foods that promote health (rather than weight loss). Further, the intervention discusses engaging in physical activity that is fun and sustainable. Finally, the group helps participants to see their commonalities as large women in a culture that elevates thinness, as a way of increasing social support.

In a randomized controlled trial, a sample of 78 obese, White women, aged 30 to 45 years old, who scored high on a measure of restrictive dieting behavior, were randomized to one of two treatment conditions: the Health-At-Every-Size group or a traditional diet program. The diet program condition included the standard components of traditional diet programs, including a focus on restricting calorie intake, eating healthier foods, exercising, and increasing social support. Both treatment conditions included 24 weekly groups of 90 minute sessions. Participants were also offered an aftercare option of six additional sessions.

Participants were measured five times: at pre-intervention, mid-intervention (12 weeks), post-intervention (26 weeks), post-aftercare (52 weeks), and follow-up (104 weeks). Assessments included physical health correlates (blood pressure, cholesterol, weight), physical activity levels, eating behaviors, and psychological measures (depression, self-esteem, body image). Results were gathered from the 19 participants in the HAES group and the 19 participants in the diet group that were available at follow-up (104 weeks). Regarding attrition, 42% of the diet group did not complete the
program, whereas only 8% did not complete the HAES program. Per their physical health outcomes, participants in the HAES group maintained their weight and BMI throughout the program and into the follow-up period. Conversely, those in the diet group significantly decreased their weight at post-intervention and maintained this weight loss through post-aftercare. However, at follow-up, participants in the diet group had regained the weight such that their weight loss was not significant from pre-intervention. Further, regarding total cholesterol, the HAES group demonstrated an initial increase from pre-intervention to post-intervention, followed by a decrease below that of baseline at follow-up, while the diet program did not demonstrate any changes in total cholesterol throughout the study. Further, both groups showed a significant decrease in LDL cholesterol levels at post-aftercare; however, the HAES group maintained this improvement, while the diet group’s improvements were not significant at follow-up.

With regard to activity levels, the HAES demonstrated a significant increase in daily energy expenditure at follow-up, while none of the improvements of the diet group were sustained at follow-up. Further, regarding eating behavior, the HAES group decreased scores on the restraint scale of the EDI through follow-up, while the diet group had an initial improvement in restraint at post-aftercare, but these improvements were not significant at follow-up. Further, the HAES group demonstrated significant improvements in four of eight subscales on an eating pathology measure at follow-up: drive for thinness, bulimia (binge eating behavior), interoceptive awareness (ability to recognize and respond to internal hunger and satiety cues, as well as emotions), and
body dissatisfaction. Those in the diet group showed an initial improvement in three of these subscales at post-intervention (bulimia, body dissatisfaction, and interoceptive awareness), although none of these improvements were maintained at follow-up. Finally, with the psychological measures, the HAES group demonstrated significant improvements in depression, self-esteem, and body image avoidance at follow-up. However, while the diet group demonstrated an initial improvement in depressive and body avoidance symptoms at post-intervention, these were not maintained at follow-up, and their self-esteem scores actually worsened at follow-up.

The next intervention called *What about Losing Weight?* (Provencher et al., 2009, p. 1856) is a Health-At-Every-Size intervention that seeks to enhance participants’ awareness of the many factors influencing body weight, as well as encourages positive lifestyle choices. Like the aforementioned *Health-At-Every-Size* intervention (Bacon et al., 2002; Bacon et al., 2005), the intervention advocates body size acceptance and teaches participants to recognize internal hunger and satiety cues, select enjoyable physical activity, and eat nutritiously. Notably, while the intervention has a formal name (e.g., *What about Losing Weight?*), the authors of the study call the intervention a Health-At-Every-Size intervention to denote that it is a member of a class of these non-diet interventions. Hence, the intervention will be described as such below.

In a three year randomized controlled trial, a sample of premenopausal obese women were assigned to the HAES condition (n = 48), a Social Support (SS) condition (n=48), and a control group (n=48). The goal of the Social Support condition was to provide participants with structured social support; hence, the themes of the HAES
condition were discussed, but no specific information or exercises were conducted, as in the HAES condition. Both of the HAES and Social Support groups were administered in 14, two hour sessions. Participants were assessed at baseline and post-intervention (e.g., four months) for eating behaviors, appetite, and BMI (Provencher et al., 2007). They were also measured at six month and one year follow-ups, with additional physical activity and metabolic measures (Provencher et al., 2009).

At post-intervention (e.g., four months), all three groups demonstrated significant improvements in eating behaviors (e.g., decreases in cognitive restraint, disinhibition, and susceptibility to hunger subscale scores). However, participants in the HAES demonstrated the greatest improvements in decreasing susceptibility to external hunger (e.g., eating based on external cues, rather than internal cues). Further, those participants in the HAES group were the only ones to demonstrate a significant decrease in appetite ratings. Finally, all three groups demonstrated a modest but significant amount of weight-loss at post-intervention (although specific numbers were not reported in this paper) (Provencher et al., 2007).

At one year follow-up, both the HAES group and SS group sustained significant decreases in susceptibility to hunger, while those in the control group did not (d = -.54 for HAES group, d = -.50 for SS group). No significant differences were reported between the two active groups on this measure. However, women in the HAES group also maintained their significant decreases in susceptibility to disinhibition (d = -.54) as compared to the control group, while women in the SS condition did not sustain their significant decreases at one-year follow-up. Notably, no group by time interactions were
found for changes in cognitive restraint (e.g., restrictive dieting behaviors) over the long-term. Also, the HAES condition did not maintain reductions in appetite ratings at one year follow-up.

In terms of physical activity, BMI, and metabolic measures, there were no significant changes for any group on measures of physical activity or metabolic functioning at one-year follow-up. However, while restriction and weight-loss was not suggested in this intervention, 63.4% of the women in the HAES condition maintained a moderate weight-loss at one-year follow-up (e.g., mean BMI of 29.5, as compared to 30.1 at baseline, or a 2% decrease). This was compared to 57.6% of women in the SS group who maintained a lower weight (e.g., mean BMI of 30.3, as compared to 30.5 at baseline, or a 1% decrease) and no loss of weight in the control group.

The last randomized controlled trial examined an intervention, called a *Non-Diet approach*, (Ciliska, 1998) with a sample of 78 obese women. Two forms of the intervention (i.e., a lecture-only format and a lecture-and-discussion format) were compared to a wait-list control group. These interventions were similar in content, but differed in format and intensity. Specifically, both groups included educational content that was comprised of strategies to learn a nondieting style of eating, the risks and benefits of obesity, cultural issues surrounding body image, enjoyable physical activity, and the relationship between dieting and emotional eating. However, the lecture-only, educational format met once a week for 12 weeks, while the psychoeducational, lecture-and-discussion format included exercises and group support and met for two hours per week for 12 weeks. Participants were measured at pre- and post-12 week
intervention on several measures of eating behavior and body satisfaction, as well as for self-esteem, depression, and social adjustment.

At post-12 week intervention, participants in the psychoeducation group (e.g., lecture-and-discussion format) demonstrated significantly improved scores on a nonrestrained style of eating (e.g., decreases on Bulimia subscale and measures of restraint), as well as improvements in body dissatisfaction, depression, and self-esteem as compared to those in the control group. Notably, those in the education-only group did not differ significantly on any of the measures from the control group.

Cumulatively, these three, randomized controlled trials demonstrate strong, preliminary support for the efficacy of Non-Diet or Health-At-Every-Size interventions in leading to both short and long-term reductions in dieting behaviors and improvements in eating based on internal cues. This is significant due to dieting being associated with a number of adverse physical and psychological health consequences (Mann et al., 2002; Miller, 1999; Polivy & Herman, 1985; 1999), and the positive health correlates associated with an unrestrained, sustainable internally-oriented eating style (Hawks et al., 2005; Smith & Hawks, 2006; Tylka & Wilcox, 2006). While the studies point to mixed results in the efficacy of these interventions in leading to increases in physical activity and other health outcomes (e.g., cholesterol levels), the results of one of the studies (Bacon et al., 2002; Bacon et al., 2005) points to significant improvements on these measures as compared to the diet program, consistent with the data on the inefficacy of dieting. Further, the two studies that pointed to decreases in body dissatisfaction
(Bacon et al., 2002; Bacon et al., 2005, Ciliska, 1998) are also worthy of note, due to its role in the development and maintenance of eating pathology (Stice, 2002).

The next two studies of Non-Diet interventions are uncontrolled with long-term follow-up assessments (e.g., three and two-year follow-ups, respectively) (Carrier et al., 1994; Roughan et al., 1989). Both of these studies demonstrated improvements in eating attitudes and behaviors, as well as other psychological improvements (e.g., depression, self-esteem, body acceptance) over the long-term follow-up periods.

The first Non-Diet intervention, *Eat for L.I.F.E. (Long-term change, Image of self, Fun, Enjoyment of Eating;* Carrier et al., 1994) was developed by the workplace wellness program staff of Conoco Inc., and was adapted from the self-help book, *Overcoming Overeating: Living Free in the World of Food* (Hirschmann & Munter, 1989). The purpose of the program was to help Conoco Inc. employees decrease their dieting behaviors and its associated adverse health outcomes, such as weight cycling, and learn an internally-directed and non-restrained style of eating. Further, the program also sought to teach participants to decrease body size preoccupation and to pursue enjoyable physical activity. The program was administered in 20 class sessions over a six month period, with the option of a series of weekly follow-up support group sessions and/or bi-monthly theme sessions (both offered for 2 years).

In a non-controlled study, a sample of 79 men and women employees took part in the intervention and were measured at pre-intervention, post-intervention (six months) and follow-up (three years). The study did not have selection criteria and allowed all employees who were interested to sign up, in an effort to make the
intervention generalizable to other workplace wellness programs. The majority of the sample were female (77%) and participants presented with a range of BMIs, with the mean of both male and female participants being in the Overweight category (e.g., 25.3 for females and 28.1 for males). Participants were assessed on changes in eating behavior, dieting behavior, physical activity, self-acceptance and self-esteem. They were also administered two informal, 30 minute interview sessions to obtain qualitative data about their experience of the class. The quantitative data was obtained with single, Likert-scale items and brief assessment measures. For example, dieting behaviors were measured by a single, 10-item Likert scale item: “How much of the time are you on a diet that requires you to sacrifice certain types of food?” Eating behaviors and attitudes towards weight were also assessed with a series of single questions regarding frequency of emotional eating, weighing behaviors, preoccupation with weight, and self-blame for eating when not hungry. Conversely, self-acceptance was assessed with an eight-item scale constructed for the study (internal consistency of alpha = .85) and self-esteem and physical activity were assessed with pre-existing measures.

Statistical analyses included a series of ANOVAs (Group x Time) with three groups: participants who dropped out of the program, participants who completed the program, and participants who engaged in follow-up sessions. As expected, participants who completed the follow-up sessions demonstrated the greatest improvements in the study’s main outcomes: decreased weighing behaviors and increases in an internally-directed eating style. Further, all three groups indicated a significant decrease in dieting behavior across time, as well as improvement in self-acceptance, and physical activity.
However, a significant main effect and interaction between the three groups was found for self-esteem. Participants who completed the program and follow-up demonstrated a significant increase in self-esteem, while those who dropped out of the program did not.

The next Non-Diet intervention, simply called *group programme*, was designed to decrease dieting attitudes and behaviors and improve positive psychological functioning, particularly self-esteem and positive body image (Roughan et al., 1989). The group focused on helping participants to increase recognition of hunger and satiety cues, as well as external or emotional eating, and to decrease body dissatisfaction. A sample of 87 women was recruited for the study. While the women were not specifically recruited for their body mass index, the average BMI fell into the obese range (e.g., BMI = 31.9). The women attended one of nine, 10-week groups in agencies across Australia and were assessed at pre-intervention, post-intervention, and six month and two year follow-ups. Measurements included eating attitudes and behaviors, body and self-image, self-esteem, depression, measures of mastery and assertion (i.e. ability to feel control over one’s life and assert oneself), and weight/BMI.

Statistical analyses included Student’s *t* tests and an ANOVA to determine changes on the measures across time. Results indicated that the women made significant improvements in all measures (i.e., eating attitudes and behaviors, self-esteem, depression, self-image, body image, and assertion), with the exception of mastery, and these improvements were not statistically different from post-intervention scores at two year follow-up. Further, at two years, the women demonstrated a
significant average weight loss of approximately 7 pounds, as compared to pre-intervention.

In sum, while these studies were less rigorous in design and the psychometrics of their assessment tools than the aforementioned randomized controlled trials, they add to the evidence of the effectiveness of non-diet interventions in contributing to long-term psychological and behavioral benefits. This includes a decrease in dieting attitudes and behaviors and increases in self-esteem and body satisfaction.

The final study is uncontrolled with a short-term assessment period (e.g., post-intervention only; Ominchinksi et al., 1995). While its methodology is the least rigorous of the Non-Diet and Health-At-Every-Size studies, it also points to the efficacy of these interventions in contributing to increases in positive psychological outcomes.

The 10-week, Non-Diet intervention, called HUGS, was developed to help participants decrease dieting attitudes and behaviors and increase healthful eating, physical activity, and self-acceptance. Participants were taught to recognize thinking patterns associated with dieting (e.g., restriction and rigidity) and learn an unrestrained way of relating with eating and movement.

A sample of 253 men and women were recruited from communities across Canada to participate in the program. Of these, 208 individuals (196 females and 12 males) completed a pre- and post-intervention quiz designed specifically for this study. As the intervention was designed for a community population without clinical eating disorders, the authors created an instrument that assessed for changes in characteristics associated with chronic dieting (e.g., the “lifestyle quiz”). The 16-item instrument
included two factors, Self-acceptance and Self-Nourishment. Self-acceptance included nine items on a six-point Likert scale (e.g., “I am unhappy with myself the way that I am”), and Self-Nourishment included 7 items (e.g., “I am out of tune with my body for natural signals of hunger and fullness”), with higher scores representing greater self-acceptance and self-nourishment. Both factors demonstrated adequate internal consistency (alpa = .71 and .66 for Self-acceptance and Self-Nourishment, respectively). At post-intervention, participants demonstrated statistically significant improvements on both the total score and subscale scores (i.e. Self-Acceptance and Self-Nourishment), as well as for each of the 16 statements of the instrument.

Overall, while it has been studied in relatively few intervention studies, the Health-at-Every-Size or Non-Diet approach, which incorporates several components of the Intuitive Eating model, appears to demonstrate preliminary effectiveness in leading to sustained positive eating behavior and improved body appreciation. This finding leads to the more general conclusion that the model and intervention of Intuitive Eating has great potential in being an effective treatment for women with a range of symptomatic eating concerns and body dissatisfaction. In other words, the Intuitive Eating paradigm appears to be a promising approach to assisting individuals to create healthy relationships with food and their bodies. It thus formed the basis for the intervention examined in this study, along with a second component: Mindful Eating.

**Mindfulness**

**Background and theoretical framework.** Mindfulness can be defined as “paying attention in a particular way: on purpose, in the present moment, and non-
judgmentally” (Kabat-Zinn, 1994, p. 4). With its roots in Buddhist practices, mindfulness has long been cultivated through meditation (Baer et al., 2005). Approximately two decades ago, Jon Kabat-Zinn, a Western physician, realized that the beneficial aspects of mindfulness could be incorporated in a secular manner into therapeutic settings to relieve psychological distress (Kristeller et al., 2006). Hence, he created the Mindfulness-Based Stress Reduction program (MBSR), a behavioral intervention to help patients with chronic pain and other stress-related disorders manage their symptoms using the practice of mindfulness meditation (Kabat-Zinn, 1982). This intervention has gained significant empirical support over the past three decades and has been adapted for the treatment of numerous psychological conditions (Baer, 2006). Further, the format of MBSR has also been adapted to Mindfulness-Based Cognitive Therapy (MBCT; Segal et al., 2002) for the treatment of depression and Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999) for Binge Eating Disorder. Both of these interventions utilize mindfulness meditation as the central treatment component (Kristeller & Hallett, 1999; Segal et al., 2002). Other interventions that utilize a component of mindfulness include Dialectical Behavior Therapy (DBT; Linehan, 1993) and Acceptance and Commitment Therapy (ACT; Hayes et al., 1999). These latter two interventions are different from MBSR and its adaptations (e.g., MBCT and MB-EAT), in that they do not incorporate mindfulness meditation, but rather use mindfulness principles and exercises. Further, they incorporate other treatment components in addition to mindfulness, including interpersonal effectiveness, emotion regulation, and
distress tolerance, in the case of DBT (Linehan, 1993), and principles of human language and cognition (e.g., Relational Frame Theory), in the case of ACT (Hayes et al., 1999).

Despite these differences, each of these mindfulness-based interventions (e.g., MBSR, MBCT, DBT, and ACT) has accrued strong empirical support for improving symptoms in a wide variety of disorders, including anxiety, depression, emotion regulation difficulties, and eating disorders, to name a few (Baer, 2006). Indeed, research has revealed that increased levels of mindfulness is associated with significantly lower anxiety, depression, and neuroticism and increased vitality, self-esteem, hopefulness, optimism, and satisfaction with life (Brown & Ryan, 2003). However, research has just begun to elucidate the mechanisms of why mindfulness is effective in leading to behavior change across a variety of psychological issues (Carmody, Baer, Lykins, & Olendzki, 2009).

Shapiro et al. (2006) proposed a model of the mechanisms of action underlying mindfulness-based interventions. The researchers proposed that the practice of intentionally attending with a nonjudgmental stance leads to a fundamental shift in perspective, which they termed “reperceiving,” (p. 377) or being able to step back and bring an observer stance to experience. They identified reperceiving as the “meta-mechanism of action” in mindfulness, which contributes to four important benefits: (a) self-regulation, (b) values clarification, (c) cognitive, emotional, and behavioral flexibility, and (d) exposure. Essentially, the observer’s stance is hypothesized to give individuals “degrees of freedom” (p. 381) in response to their internal processes, which
helps decrease dysregulation and the enacting of habitual maladaptive patterns of behavior.

The self-regulatory and exposure mechanisms of mindful awareness and an accepting outlook towards the present moment appear to be the primary components that justify the use of mindfulness-based interventions in eating and weight-related concerns (Kristeller et al., 2006). Specifically, both excessive eating and restrictive behaviors are commonly conceptualized as habitual ways to cope with distressing emotions (Fairburn, Cooper, & Shafran, 2003; Safer et al., 2001; Telch et al., 2001). As such, present-moment awareness can be helpful in both exposing individuals to their negative emotions and helping decrease reactivity to them. Indeed, the formal mindfulness meditation practices (e.g., sitting meditation, body scan, yoga) serve as intense practice sessions for being with “whatever comes up” (Kabat-Zinn, 1990, p. 66) in one’s mind without reacting to the thoughts, emotions, or body sensations. This non-reactivity is then better able to be cultivated in everyday life. Further, the concrete practice of focusing on one’s breath and body in meditation then enables individuals to use these tools throughout the day to remind themselves to wake up to the present moment, rather than react in habitual ways (Kabat-Zinn, 1990). Hence, this practice can be helpful in self-regulation, giving people “degrees of freedom” between their thoughts, emotions, body sensations and old behaviors (Shapiro et al., 2006, p. 380), such as eating based on external cues or starving the body (Baer et al., 2006; Kristeller et al., 2006; Kristeller & Hallett, 1999). Further, the accepting and actively nonjudgmental nature of mindfulness is thought to encourage people to be able to
examine their behaviors with less judgment and more compassion, which paradoxically can facilitate their ability to change (Kristeller et al., 2006; Smith et al., 2006). Indeed, when individuals cannot accept that they are struggling with certain behaviors, it can be easier to simply avoid looking at them. However, when individuals are given permission to let go of that self-flagellation and bring a kind attention to themselves, they can turn that energy towards growth. As Kabat-Zinn (1990) states, “You have to accept yourself as you are before you can really change” (p. 38).

**Intervention studies.** Each of the four mindfulness-based interventions (e.g., ACT, DBT, MBSR, and MBCT) has been adapted for the treatment of eating disorders and/or obesity. Further, original mindful eating programs created exclusively for eating and weight issues include Mindfulness-based Eating Awareness Treatment (MB-EAT), which is based on the MBSR program, and the Mindful Eating and Living (MEAL) program (Kristeller & Hallett, 1999; Shelley, 2009). As described in previous sections in this paper, while the research on these interventions is still in its infancy, each of them has gained preliminary support in reducing disordered eating (Baer et al., 2006; Kristeller & Hallett, 1999; Safer et al., 2001; Smith et al., 2006; Telch et al., 2001) or, with the exception of one ACT intervention (Tapper et al., 2008), assisting in weight loss (Forman et al., 2009; Shelley, 2009). However, only the studies of MBSR-based interventions and original mindful eating programs for these concerns will be discussed in more detail again below, as these were the interventions that informed the *Eat for Life* intervention. Unlike ACT and DBT, mindfulness meditation is the central treatment component of MBSR and its adaptations (e.g., MBCT and MB-EAT) and the MEAL
program. Further, the creator of the *Eat for Life* intervention was trained extensively in the MBSR model. As such, studies of the following interventions for obesity, eating disorders, and sub-threshold disordered eating will be examined again in detail below: the Mindful Eating and Living Program (MEAL; Shelley, 2009) for obesity, Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999) for Binge Eating Disorder, an adaptation of MBSR for sub-threshold Binge Eating Disorder (Smith et al., 2006), and Mindfulness-based Cognitive Therapy (MBCT; Baer et al., 2006) for full-syndrome and sub-threshold Binge Eating Disorder.

For the treatment of obesity, the Mindful Eating and Living Program (MEAL) has gained preliminary support (Shelley, 2009). Notably, while the MEAL manual was shared with the creator of the *Eat for Life* intervention, the randomized controlled trial of the MEAL program has not yet been published in its full form. However, an abstract of this study has been published (Shelley, 2009) and the following discussion is based upon this. The MEAL program is a six-week, original mindful eating group intervention designed to help individuals achieve sustainable weight loss. The group includes general awareness-training, discussion of hunger, satiety, and emotional eating, eating exercises, and physical movement (e.g., yoga and walking). In a study of 40 postmenopausal obese women, participants were assigned to either the MEAL intervention or a traditional diet program of the same length. At follow-up (one year), both groups had lost an average of 10-12 pounds. However, those in the MEAL group demonstrated larger effect sizes (actual effect sizes not published in the abstract). Further, participants in the mindfulness group demonstrated improvements in risk
factors for cardiovascular disease, including significantly decreasing their C-reactive protein and waist-to-hip ratio at four months post-intervention, while the diet program participants did not demonstrate these improvements. Hence, while the data on the MEAL program for the treatment of obesity is obviously preliminary, this study points to promising results for the use of mindful eating programs for individuals with obesity and related weight-related health difficulties.

In contrast to the treatment of obesity, mindfulness-based interventions are more numerous for the treatment of binge eating. Studies of Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999) for Binge Eating Disorder, an MBSR adaptation for sub-threshold Binge Eating Disorder (Smith et al., 2006), and Mindfulness-based Cognitive Therapy (MBCT; Baer et al., 2006) for full-syndrome and sub-threshold Binge Eating Disorder have all garnered preliminary support in leading to decreased binge eating symptoms.

Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999) is a six-week, original meditation-based group for the treatment of individuals with full-syndrome Binge Eating Disorder. The program utilizes three forms of mindfulness meditation: general meditation, eating meditation, and mini-meditations. The general meditations were designed to help participants practice becoming aware and exposed to their thoughts, emotions, and body sensations with non-judgment. The eating meditations were then taught to help participants increase this awareness in direct reference to eating, and the mini-meditations were designed to help participants increase their awareness prior to meals or times in which they were prone to binge
eating. The group also incorporated a weekly theme that covered topics such as hunger and satiety awareness, triggers for binge eating, and self-forgiveness.

In a non-controlled study, 21 women with BED were administered the MB-EAT program. Participants were administered measures of binge eating, depression, and anxiety at pre-intervention, mid-treatment (four weeks), post-intervention (six weeks), and follow-up (three weeks later). They were also asked weekly about their number and intensity of binge eating episodes, as well as their sense of mindfulness and awareness of hunger and satiety cues during the week.

Results of the study indicated a significant decrease in the reported frequency and intensity of binge eating over the course of treatment. Specifically, nine participants reported reducing their binges from the minimum of two required for diagnosis to less than one per week, while five participants reported one to two per week at post-intervention. Further, while 70.28% of participants rated their binges as being “large” at pre-intervention, this number reduced to 23.61% at follow-up. Scores on the binge eating questionnaire also fell significantly from pre-intervention to follow-up, while levels of mindfulness and awareness of hunger and satiety cues increased significantly. Finally, scores on the measures of depression and anxiety also decreased significantly.

Notably, time spent using the eating meditation was related to change in binge eating scores ($r = .66, p < .01$) and participants’ level of mindfulness was related to a decrease in the frequency of binges ($r = .76, p < .001$). However, the amount of meditation practiced did not predict levels of mindfulness, as was initially hypothesized.
Next, the standard MBSR program was modified to decrease sub-threshold binge eating behaviors in a general population of men and women (Smith et al., 2006). This eight-week intervention included the regular components of MBSR, with the addition of more frequent mindful eating exercises and a potluck at the full-day silent meditation retreat. Participants were 25 adult men and women who were recruited for the general MBSR course, with no mention of the emphasis on binge eating. They were assessed for binge eating, levels of mindfulness, depressive symptoms, anxiety symptoms, and self-acceptance.

Results indicated that at pre-intervention, 13 of the participants demonstrated no initial binge eating and as such, these participants demonstrated no change in their binge eating throughout treatment. However, for the 12 participants who reported binge eating, there was a significant reduction in binge eating at post-intervention, with a moderate to large effect size ($d = .71$, $t = 4.82$, $p < .01$). Specifically, the seven participants in the “mild” range of binge eating demonstrated large, statistically significant reductions in their binge eating at post-intervention. For the two participants in the “moderate” range and three participants in the “severe” range of binge eating, there were also large decreases in their binge eating, although the differences were not significant. Further, reductions in binge eating were significantly associated with reduced state anxiety and increased self-acceptance. However, reductions in binge eating were not shown to be correlated with increases in mindfulness or depressive symptoms. Importantly, however, the authors point to the small sample size as most
likely impacting these relationships and state that they are continuing to collect data to
delineate these outcomes.

Finally, a pilot study of Mindfulness-based Cognitive Therapy (MBCT) for the
treatment of binge eating was conducted with ten women with full-syndrome and sub-
threshold BED (Baer et al., 2006). Specifically, six of the participants met criteria for full-
syndrome BED and four had sub-threshold BED. The 10-week group intervention
included the mindfulness components of the standard MBCT program, with the
substitutions of information on Binge Eating Disorder when the content focused on
depression (e.g., the disorder for which MBCT was initially created). Specifically,
participants were trained to do various forms of mindfulness meditation (e.g., sitting
meditation, body scan, mindful stretching and walking, and mindful eating) and to
extend mindfulness to their daily lives. They were taught to cultivate non-judgment
towards their thoughts and to observe their triggers with binge eating.

Participants were tested at pre-intervention and post-intervention (10 weeks).
Binge eating behaviors were measured with the numbers of reported objective and
subjective binge eating episodes per month and a binge eating questionnaire. Other
eating and weight concerns were also assessed, as well as participants’ level of
mindfulness and depressive symptoms.

Results of this preliminary study were mixed. While all participants decreased
their objective binges per month, four participants noted an increase in their subjective
binge eating episode frequency (i.e., after treatment, they labeled what they had
previously not considered binges to be so). Further, scores on the binge eating
questionnaire dropped for all participants except for one; however, while participant’
scores on restraint and shape concerns improved at post-intervention, they were still
above the normative range. In addition, scores on weight concerns increased slightly at
post-intervention. Results were also mixed in terms of attitudes about eating, with
beliefs about eating alleviating negative affect and leading to out of control feelings
decreasing slightly (but still above the normal range), but beliefs that eating alleviates
boredom increasing slightly. Finally, scores on levels of mindfulness increased
moderately at post-test and depression symptom scores dropped to the minimum
range. In sum, this pilot study pointed to mixed results as to the efficacy of a MBCT
adaptation for the treatment of binge eating.

Notably, none of the reviewed studies of the mindfulness-based interventions
included a measure of body image. This appears to be a major oversight, due to the
significance of body dissatisfaction in relation to the development and maintenance of
obesity and disordered eating (Stice, 2002). Further, the theoretical components and
mechanisms of mindfulness have been suggested to be ideal for the treatment of body
image disturbance, including the cultivation of nonjudgment and compassion, becoming
aware of rigid patterns of thinking, and experiencing the body from within rather than
externally (Stewart, 2004).

In sum, the literature on mindfulness-based interventions with a strong
mindfulness training component points to preliminary efficacy in treating obesity and a
range of binge eating behaviors, as well as a need for further research. Specifically, the
MEAL program (Shelley, 2009) appears to be a promising intervention for sustainable
weight loss. Further, while the MBCT intervention pointed to mixed results for the treatment of binge eating (Baer et al., 2006), the MBSR adaptation and the MB-EAT program both led to significant reductions in binge eating. However, as three of these interventions were non-randomized and had small sample sizes, further research is needed on the efficacy of mindfulness-based interventions for the treatment of eating concerns.

Importantly, as with Intuitive Eating, the mechanisms of mindfulness appear to have the ability to cut across diverse problematic relationships with food and people’s bodies. Taken together, Intuitive Eating and Mindfulness programs offer participants hands-on, experiential techniques to self-regulate their eating and movement, as well as to bring acceptance to themselves in the process. Thus, the focus of this study, *Eat for Life*, was based on these two programs.

**Eat for Life**

Taking into account the previously described problem of normative discontent and the lack of interventions for a heterogeneous population of adult women with a wide range of symptoms, a University of Missouri health psychologist, Dr. Lynn Rossy, with contributions from the author, developed a workplace wellness intervention, called *Eat for Life*. This intervention incorporated Tribole & Resch’s (1995) Intuitive Eating model and a Mindfulness-based approach drawing mostly from Shelley’s MEAL program, Kristeller’s MB-EAT, and Kabat-Zinn’s MBSR program (e.g., the program on which each of the aforementioned mindful eating programs were based). This combination was chosen to provide participants with the content of re-learning a
sustainable, internally-oriented approach to eating and experiencing the body (from the *Intuitive Eating* approach), with the experiential, self-regulatory training of mindfulness practice.

In this 10-week group intervention, each class comprised a theme that combined ideas and exercises from Intuitive Eating and Mindfulness. Themes of the ten classes included: 1) the *BASICS of Mindful Eating* (developed by the creator of *Eat for Life*), incorporating the tools of mindful eating and including content termed: Belly Check, Assess your Food, Slow Down, Investigate throughout the Meal, Chew Thoroughly, Savor your Food); 2) *Body Talk* (i.e. relearning how to listen to internal hunger cues and paying attention to negative body self-talk); 3) *Food Wisdom* (i.e., balancing letting go of forbidden foods, paying attention to satiety cues, and learning triggers for overeating); 4) *Food Thoughts* (i.e., bringing awareness of one’s beliefs and self-talk related to food, particularly thoughts related to the diet/binge cycle); 5) *What are you really (really, really) hungry for? (hint: It isn’t always food)* (i.e., learning about emotional eating and meeting emotional needs in other ways); 6) *Supporting Satiety & Satisfaction* (i.e., learning how nutritious, whole foods can bring one into balance and health); 7) *Becoming Physically Active* (i.e., finding movement that feels good to the body); 8) *Becoming a Conscious Connoisseur* (i.e., eating foods that taste and feel good to the body and are globally sustainable); 9) *Respecting and Appreciating Your Body* (i.e., relearning how to bring awareness to how the body feels and functions, rather than how it looks); and 10) *Eating for Life* (i.e. planning for how to continue along the path of mindful eating). To support incorporating these ideas and practices into participants’
lives, each class included substantive mindfulness meditation training, as well as homework assignments to practice meditation daily. The importance of formal mindfulness practice was emphasized as a way for participants to increase their daily mindful awareness of their thoughts, emotions, and body sensations related to eating, food, and their bodies (e.g., their internal hunger and satiety cues, restrictive/dieting thought patterns, and triggers for emotional eating). Specifically, each class began with a formal mindfulness meditation practice (e.g., sitting meditation, body scan, or yoga). Participants were then encouraged to do these practices at home, in order to have a concentrated period of mindfulness training each day. Each class also included eating meditation and/or mini-meditation (e.g., “Taste of Mindfulness”) training, which were mindfulness practices to be used while eating or before eating, respectively, to encourage bringing awareness to eating and one’s reasons for eating. Finally, as part of Eat for Life, participants were encouraged to read Tribole and Resch’s (1995) Intuitive Eating and Geneen Roth’s Breaking Free from Emotional Eating (1993), as well as the hand-outs on mindfulness (provided by the developer of Eat for Life), every week, in order to support the themes of the course. Participants also were given a BASICS slip each week (e.g., a slip of paper with one of the BASICS of the course written on it), to help them remember to practice a component of mindful and intuitive eating (For more information about the Eat for Life program content, see Appendix A which instructs the reader on how to obtain the complete program manual).

In short, the Eat for Life program was designed to help a community sample of women with diverse weights and a variety of symptomatic concerns to create a positive,
sustainable relationship with their food and bodies. Specifically, the goal of the intervention was to assist women in increasing intuitive eating, increasing mindfulness, increasing body appreciation, and decreasing disordered eating behaviors.

Support for Eat for Life

A preliminary, non-controlled (and unpublished) study of the Eat for Life program was conducted with a sample (n = 64) of male and female participants (57 women, 7 men; Rossy, Bush, & Bike, 2009). The vast majority of the sample (89%) were Caucasian (n = 57), while 5% (n = 3) was Native American; One participant identified as African American.

Participants were screened at pre-intervention for eating pathology with the Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz et al., 1997). Results of this measure indicated that 18% (n = 11) of the sample had full-syndrome eating disorders, 48% (n = 31) were symptomatic (i.e. demonstrated symptoms of eating disorders), and 34% (n = 22) of the sample was asymptomatic (e.g., did not demonstrate symptoms of an eating disorder). In terms of the participants with full-syndrome eating disorders, all but one of them had Binge Eating Disorder (n = 10). The remaining participant had Bulimia Nervosa. Of the symptomatic participants, 15% (n = 11) were chronic dieters, 13% (n = 8) had subthreshold BED, 10% (n = 6) were binge dieters (i.e. cycle between binge eating and dieting), and 10% (n = 6) were labeled “other” (i.e. did not fit the Q-EDD symptomatic categories). Pertaining to their weight class (BMI), the majority of participants (37%, n = 23) were Moderately Obese (BMI = 30.1 – 40), 31% (n = 20) were
Overweight (BMI = 25.1 – 30), and 20% (n = 13) were Normal weight (BMI = 20.1 – 25). Of the six remaining participants, four were Grossly Obese (BMI = over 40.1) and two were Low weight (BMI = 18.1 – 20.1).

Participants were measured at pre-intervention and post-intervention (e.g., 10 weeks) on levels of intuitive eating, body appreciation, and mindfulness. Disordered eating (as measured by the Q-EDD) was only used as a screening tool in this study and was not administered at post-intervention. Intuitive Eating was measured with the Intuitive Eating Scale (IES; Tylka, 2006), body appreciation was measured with the Body Appreciation Scale (BAS; Avalos, Tylka, & Wood-Barcalow, 2005), and Mindfulness was measured with two separate questionnaires at different times, the Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) and the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). (Note: the use of two mindfulness questionnaires was due to temporary indecision as to which questionnaire was more appropriate for the population. The FFMQ was ultimately chosen as the most useful tool for the current study).

A series of dependent t-tests were used to analyze differences between pre- and post-intervention scores on the three outcome measures. Results indicated that participants significantly increased their levels of intuitive eating (t (1, 45) = 8.36, p < .001), body appreciation (t (1, 45) = 6.43, p < .001), and mindfulness on both the Five Facet (t (10) = 2.21, p < .05) and MAAS (t (45) = 3.22, p < .005) from pre- to post-intervention. Further, in addition to improved scores on the total IES, significant increases were found on all three Intuitive Eating subscales: Permission (t_{(45)} = 4.86, p <
.001), Physical Reasons ($t(45) = 5.58, p < .001$), and Reliance ($t(45) = 12.29, p < .001$), with
the Reliance subscale demonstrating the largest change of the three subscales.

In sum, this preliminary study pointed to promising results as to the efficacy of
*Eat for Life* in contributing to a number of positive outcomes, including more internally-focused eating behavior, improved body acceptance, and increased levels of awareness.

**This Study**

The purpose of this study was to further evaluate this program with community
women suffering from normative discontent with their bodies and eating and weight-related behaviors. Such normative discontent includes body dissatisfaction, a range of
disordered eating behaviors (with the exclusion of full-syndrome Anorexia Nervosa or
Bulimia Nervosa), and obesity and overweight. Consistent with the Intuitive Eating
theory, increases in intuitive eating that hopefully result from this intervention would
also result in decreases or increases in weight, depending on what individuals need
physiologically. However, as the Intuitive Eating intervention suggests decreasing
preoccupation with weight and focusing on related health correlates, weight was not
used as an outcome measure. Rather, outcome measures include Intuitive Eating,
Mindfulness, and Body Appreciation, as well as disordered eating category or diagnosis.

It was hypothesized that the Eat for Life intervention would increase participants’
intuitive eating, mindfulness and body appreciation, as well as alleviate or decrease
disordered eating symptoms. Indeed, such a finding would be significant in terms of
creating a much needed, low-cost intervention that could be administered to a wide
range of community women.
Chapter Three: Method

This chapter is divided into five subsections describing the methodology of this study. First, participants of the study are described. Second, the psychometric properties of the instruments used in the study are delineated. Third, the procedure of the study are explained, including a description of the *Eat for Life* program. Finally, the statistical procedures used to test the hypotheses of the study are provided.

Participants

A total of 193 individuals (93 participants in the intervention group and 100 participants in the wait-list control group) enrolled in the study by completing pre-10 week questionnaires. Of these participants, 15 males were excluded from the study (eight from the intervention group and five from the wait-list control group). In addition, two wait-list control group participants were excluded from the study due to meeting criteria for full-syndrome Bulimia Nervosa on the Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz et al., 1997). Twenty-three female participants in the intervention group who told the instructor that they were no longer attending the intervention or who missed at least six of the 11 classes were also excluded. Finally, nine female intervention group participants and 22 female wait-list control group participants were excluded from the study because they did not complete either one of or both post-test questionnaires. These exclusions resulted in a total of 124 female participants: 53 in the intervention group and 71 the wait-list control group.

All 124 female participants were employed or relatives of employees in the University of Missouri system. As seen in Table 1, the average age of the sample was 45
years old (SD = 11.30). Of the 123 participants who reported their ethnicity, the majority were (87.9%, N = 109) were Caucasian. Likewise, of the 52 intervention participants who reported their ethnicity, the majority, or approximately 77.4% were Caucasian (N = 41). The same also held true for the wait-list control group: The majority of participants (95.8%, N = 68) were Caucasian. Across the total sample, approximately 5.6% (N = 7) were African American, 1.6% (N = 2) were Latino, 1.6% (N =2) were Bi-racial or Multi-racial, 1.6% (N=2) were “Other,” and 0.8% (N = 1) were Native American. Concerning education level, the most commonly reported highest degree was a Bachelor’s degree in both the total sample and also within both the intervention and the wait-list control group.

As seen in Table 2, participants varied widely on the continuum of weight categories, delineated by body mass index (BMI). The most commonly reported weight category in the total sample was moderately obese (38.7%, N = 48; BMI 30.1 – 40). This was also true for the intervention group, with 56.6% (N = 30) of the sample being moderately obese. However, for the wait-list control group, the most commonly reported weight category was overweight (31.0%, N = 22; BMI 25.1 – 30), followed closely by those who were moderately obese (25.4%, N = 18) and normal weight (23.9%, N = 17; BMI 20.1 – 25).

Participants reported a spectrum of eating and dieting behaviors. As can be seen in Table 3, 41.1% (N = 51) of the total sample were symptomatic, or reported symptoms of eating disorders, at baseline (as measured by the Questionnaire for Eating Disorder Diagnoses; Q-EDD; Mintz et al., 1997). Another 33.1% (N = 41) of participants were
asymptomatic, or reported no significant symptoms of eating disorders, at baseline.

Another quarter of the sample (25.8%, \(N = 32\)) met criteria for the full-syndrome eating disorder of Eating Disorder NOS (EDNOS). This fairly equal distribution among participants’ eating behaviors was also seen in the intervention and wait-list control groups. For example, 18 (34.0%) intervention group participants were symptomatic, another 18 (34.0%) were asymptomatic, and 12 (32.1%) met Q-EDD criteria for classification as EDNOS.

In terms of dieting behaviors, participants in the total sample estimated they had dieted for approximately 39.3% of their lives, with the wait-list control group reporting a slightly higher similar percentage of lifetime dieting than the intervention group (41.3% in wait-list control group, 36.6% in the intervention group). The most commonly reported diet in the total sample was Weight Watchers (61.3%, \(N = 76\)), with 69.8% (\(N = 37\)) of the intervention group and 54.9% (\(N = 39\)) of the wait-list control group endorsing having utilized this diet method.

**Measures**

**Intuitive eating.** The Intuitive Eating Scale (IES; Tylka, 2006) contains 21 items that are designed to assess three components of intuitive eating: 1) reliance on internal hunger and satiety cues, hereafter Reliance (e.g., “When I’m eating, I can tell when I am getting full”); 2) eating for physical rather than emotional reasons, hereafter Physical Eating (e.g., “I stop eating when I feel full (not overstuffed)”); and 3) unconditional permission to eat, hereafter Permission (e.g., “If I am craving a certain food, I allow myself to have it”). Items are rated on a 5-point scale that ranges from 1 (strongly
disagree) to 5 (strongly agree). Higher scores reflect higher levels of intuitive eating. Subscale scores are an average of the items and thus range from one to five. The total score also ranges from one to five and is an average of the items.

The IES has demonstrated strong psychometric properties in multiple studies of college-aged women (Avalos & Tylka, 2006; Tylka, 2006; Tylka & Wilcox, 2006). Specifically, the IES has demonstrated high internal consistency reliability for both the total score (alpha = .85-.89) and individual subscales (Physical Eating has ranged from .85 to .89, Reliance from .72 to .79, and Permission from .87 to .91; Avalos & Tylka, 2006; Tylka, 2006; Tylka & Wilcox, 2006). In the current study, the internal consistency of the total IES was similar to these studies (alpha = .83). The individual subscales also demonstrated high alpha coefficients in the current study (Physical Eating = .83, Permission = .82, Reliance = .79).

The total IES and individual subscales have also demonstrated good retest reliability over a three week period ($r = .90$ for total IES; $r = .88, .74, and .88$ for subscales Physical Eating, Reliance, and Permission, respectively; Tylka, 2006). The construct validity of the IES has been demonstrated by the negative relationships of the total IES and individual subscales (particularly Permission) with eating disorder symptomology ($r = -.69$ for total IES; $r = -.24$ for Physical Eating, -.27 for Reliance, and -.76 for Permission) and body dissatisfaction ($r = -.56$ for total IES; $rs = -.33$ for Physical Eating, -.35 for Reliance, and -.48 for Permission; Tylka, 2006). Another study found each of the IES subscales to be moderately to strongly negatively related to the Dieting and Bulimia/Food Preoccupation subscales of the Eating Attitudes Test-26 (EAT-26; Garner,
Olmstead, Bohr, & Garfinkel, 1982), with $r = -.13$ and -.26 for Physical Eating, -.35 and -.36 for Reliance, and -.67 and -.40 for Permission with the Dieting and Bulimia/Food Preoccupation subscales, respectively. Further, the total IES and each of the three IES subscales has been found to be moderately to strongly associated with multiple measures of psychological well-being (with the exception of the Permission subscale with proactive coping), such as self-esteem ($r = .44$ for total IES; $r = .30$ to .36 for Physical Eating, .34 to .35 for Reliance, and .23 to .28 for Permission), optimism ($r = .29$ for total IES; $r = .24$ to .25 for Physical Eating, .24 to .31 for Reliance, and .10 to .14 for Permission), and proactive coping ($r = .29$ for total IES; .26 to .27 for Physical Eating and .33 to .34 for Reliance; Tylka, 2006; Tylka & Wilcox, 2006). A copy of the Intuitive Eating Scale can be found in Appendix B.

**Body appreciation.** The Body Appreciation Scale (BAS; Avalos, Tylka, & Wood-Barcalow, 2005) is a 13-item questionnaire that is designed to assess degree of body appreciation. Items are rated on a 5-point scale ranging from one (never) to five (always). Items are averaged to obtain a total BAS score, which ranges from one to five. Higher scores reflect greater body appreciation (e.g., “I feel good about my body”).

The BAS has demonstrated strong psychometric properties in samples of college women (Avalos & Tylka, 2006; Avalos et al., 2005). Specifically, the BAS has high internal consistency reliability (alpha = .91-.94; Avalos & Tylka; Avalos et al., 2005). The BAS also demonstrated high internal consistency in the current study (alpha = .91).

The BAS has also demonstrated good retest reliability over a three-week period
The construct validity of the BAS has been demonstrated by its strong negative relationships with eating disorder symptomology \( r = .90 \), body dissatisfaction \( r = -.60 \), and body preoccupation \( r = -.79 \), and moderate to strong positive relationships with several measures of psychological well-being, including self-esteem \( r = .65 \), optimism \( r = .51 \), and proactive coping \( r = .36 \); Avalos et al., 2005). In addition, in an exploratory study of a model of intuitive eating, higher scores on the BAS predicted higher scores on the Intuitive Eating Scale (IES; Tylka, 2006). Further, body appreciation was found to fully mediate the influence of body acceptance by others in predicting intuitive eating (Avalos & Tylka, 2006). A copy of the Body Appreciation Scale can be found in Appendix C.

**Mindfulness.** The Five-Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) is a 39-item questionnaire that assesses multiple components of mindfulness: 1) Nonreactivity to Inner Experience (e.g., “I perceive my feelings and emotions without having to react to them”); 2) Observing (e.g., “When I’m walking, I deliberately notice the sensations of my body moving”); 3) Describing (e.g., “I can usually describe how I feel at the moment in considerable detail”); 4) Nonjudging of Inner Experience (the reversed scored item, “I think some of my emotions are bad or inappropriate and I shouldn’t feel them”); and 5) Acting with Awareness (e.g., the reverse scored item, “I do jobs or tasks automatically without being aware of what I’m doing). Items are rated on a 5-point scale that ranges from one (Rarely or Very Rarely True) to five (Very Often or Always True). The total FFMQ score ranges from 39 – 195 and each individual facet score ranges from 8 – 40, with the exception of Nonreactivity
to Inner Experience, which ranges from 7 – 35. Higher scores represent higher levels of mindfulness.

The FFMQ has been shown to have strong psychometric properties in undergraduate and community samples of both individuals who meditate and those who do not (Baer et al., 2006; Baer et al., 2008). Notably, in their initial sample of non-meditating undergraduate students, four of the facets (e.g., Describing, Acting with Awareness, Nonjudging of Inner Experience, and Nonreactivity to Inner Experience) were found to be clear indicators of an overarching mindfulness construct; however, the Observing facet did not fit the model (Baer et al., 2006). This finding was contrasted with a later sample of meditators, in which all five facets indicated an overarching mindfulness factor (Baer et al., 2008). However, despite these findings of an overarching mindfulness score, the reported reliability and validity information reported by the original authors pertain solely to the individual facets.

In samples of meditators and nonmeditators, the FFMQ has demonstrated adequate to good internal consistencies for all facets (alpha = .67 – .92; Baer et al., 2006; Baer et al., 2008). The later study of meditators and nonmeditators (Baer et al., 2008) reported only ranges for the facets (range .72 to .92), with the exception of Nonreactivity to Inner Experience (alpha = .67). The original study (Baer et al., 2006) reported the alpha coefficients for the individual facets in the sample of nonmeditating undergraduate students: Nonreactivity to Inner Experience = .75, Observing = .83, Act with Awareness = .87, Describing = .91, and Nonjudging of Inner Experience = .87. In the current study, the individual facets demonstrated correspondingly high alpha
coefficients (Nonreactivity to Inner Experience = .83, Observing = .79, Act with Awareness = .86, Describing = .94, Nonjudging of Inner Experience = .90). The total FFMQ also demonstrated high internal consistency in the current study (alpha = .91). As retest reliability has not been reported for the FFMQ, data from the control group in the current study will serve as the retest reliability estimate. The FFMQ demonstrated adequate retest reliability in the current study ($r = .85$).

Construct validity of the facets has been demonstrated by their strong correlation with a variety of other constructs that fit with the predictions of the scale creators. To name several key examples of the strongest correlations, the Observe facet is positively related with openness to experience ($r = .42$), Describe is negatively associated with alexithymia ($r = -.68$) and positively associated with emotional intelligence ($r = .60$), Acting with Awareness is negatively associated with dissociation ($r = -.62$), Nonjudgement of Inner Experience is negatively related with thought suppression ($r = -.56$) and neuroticism ($r = -.55$), and Nonreactivity to Inner Experience is positively related to self-compassion ($r = .53$) (Baer et al., 2006). Further, a subsequent study found moderate to large correlations of each of the five facets with a measure of psychological well-being in meditators ($r = .45$ for Observe, .36 for Describe, .51 for Acting with Awareness, .50 for Nonjudgment of Inner Experience, and .44 for Nonreactivity to Inner Experience), and significant correlations for all but the Observe facet in nonmeditating students ($r = .08$ for Observe, .34 for Describe and Acting with Awareness, .52 for Nonjudgement of Inner Experience, and .44 for Nonreactivity to Inner
Experience) (Baer et al., 2008). A copy of the Five-Facet Mindfulness Questionnaire can be found in Appendix D.

**Disordered eating behaviors.** The Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz et al., 1997) is a 50-item self-report questionnaire that operationalizes the DSM-IV eating disorder diagnoses. Based on scoring manual decision rules, respondents are placed into diagnostic categories. Respondents are first classified as eating-disordered or non-eating disordered. If non-eating disordered, respondents can be asymptomatic or symptomatic (e.g., demonstrating sub-threshold disordered eating symptoms). If symptomatic, respondents can be classified as having one of several disordered eating patterns, such as binge-dieting (e.g., switching between dieting and binge eating). If Eating Disordered, respondents can be classified as having Anorexia Nervosa (AN), Bulimia Nervosa (BN), or Eating Disorder Not Otherwise Specified (EDNOS). The EDNOS diagnosis then includes a sub-classification system, where respondents can meet criteria for Binge Eating Disorder (BED) or other types of EDNOS diagnoses.

The Q-EDD has demonstrated strong psychometric properties with eating-disordered and non-disordered samples of women (Mintz et al., 1997). Specifically, the Q-EDD has demonstrated strong test-retest reliability over a two week period (e.g., kappa values ranged from .85-.94) and criterion validity with clinical interviews and clinician judgment (e.g., accuracy rates of 98% and 78%, respectively). Further, a study with a nonclinical sample of African American college women also demonstrated high diagnostic accuracy rates (i.e., 95% for differentiating between eating disordered and
non-disordered and 86% for differentiating between eating disordered, symptomatic, and asymptomatic) (Mulholland & Mintz, 2001). The Q-EDD was not able to be assessed for internal consistency in this study due to the construction of the scale.

A copy of the Questionnaire for Eating Disorder Diagnoses can be found in Appendix E.

**Supplemental and Demographic Questionnaire.** A brief, author-constructed questionnaire was used to assess participants’ demographics (e.g., age, gender, identified ethnic group), experiences with dieting, physical activity, and weight. Additionally, this questionnaire asked intervention group participants about both their goals for the class (asked at pre-intervention) and what they learned from the program (asked at post-intervention). Post-intervention, wait-list control group participants were asked if they made any changes to address their concerns with food, eating, or their body in the 10-week interim period. A complete copy of this supplemental questionnaire can be found in Appendix F (Pre-Program questionnaire) and Appendix G (Post-Program questionnaire).

**Procedure**

Prior to recruiting subjects for the study, power analyses were run, through which it was determined that that a medium effect size of $R^2 = 0.15$ would be appropriate for this study. Based on these estimates, it was anticipated that a sample size of 45 participants (divided equally between intervention and wait-list control group) would be necessary to achieve a power of 0.80 for identifying overall between-group differences on the dependent variables.
Participants were recruited through the University of Missouri system, including three campuses (Columbia, Kansas City, and St. Louis). Specifically, they were recruited via two mass email systems (MU Info announcements, which are distributed to students and employees of the Columbia campus, and T.E. Atkins Healthy for Life program updates, which are distributed to all UM system employees). These mass emails were distributed in two forms: one that recruited individuals for immediate enrollment in the 10-week Eat for Life class (i.e., the intervention group) and one seeking individuals to complete two sets of questionnaires over a 10-week interim period, after which they would be offered the Eat for Life class (i.e., the wait-list control group). This recruitment method allowed participants the opportunity to self-select their enrollment in either the intervention or wait-list control group. This nonrandomized assignment was chosen due to the T.E. Atkins Healthy for Life program’s commitment to provide services to employees seeking treatment in a timely manner and according to clinical need. It was thus deemed necessary and appropriate to make available the Eat for Life class immediately upon request of the service, and explicitly recruit other participants for the requirements of the wait-list control group.

The mass email announcements sent out to recruit for both the intervention and wait-list control groups described the Eat for Life program in an identical manner. Specifically, the text of both email messages described the Eat for Life program as using “mind-body practices and intuitive eating principles as the foundation for learning how to develop a healthy relationship with your food, mind, and body.” Further, people who would potentially benefit from the program were described in the mass emails as those
who “eat when they are stressed, bored, or unhappy or have a history of yo-yo dieting.” This language was chosen due to its inclusion of the wide spectrum of eating pathology that the Eat for Life intervention targets. The distinctive aspect of the wait-list control recruitment email was its description of seeking potential participants to “complete two sets of online surveys over a 10-week period as wait-list control participants in a study about the benefits of Eat for Life.” It then informed participants that they would be offered the Eat for Life class “at a reduced fee” subsequently (See Appendix H for complete text of both forms of emails).

Intervention group participants were administered pre-intervention questionnaires (i.e., BAS, IES, FFMQ, Q-EDD, and Supplemental/Demographic) at the orientation session that was held one week before the first Eat for Life class. They were informed that their participation in the study portion of the class was voluntary. They then participated in the 10-week Eat for Life course and were administered the post-questionnaires (same as pre-intervention questionnaires) on the last day of the course.

Upon emailing the primary investigator to express interest in participating in the study, wait-list control participants were emailed a link to the pre-questionnaires on an online survey engine. They were then sent an email with a link to the post-questionnaires after a 10 week waiting period. After their completion of the post-questionnaires, they were sent enrollment information about the Eat for Life class.

Study inclusion criteria was status as an employee or relative of an employee in the UM system and expressed interest in the program upon receiving the mass email announcements. Exclusion criteria included identification as a male, diagnosis of full-
syndrome of Anorexia or Bulimia Nervosa, or evidence of significant medical concerns, active thought disorder, severe mood disorder, or preparation for Bariatric surgery.

Men were excluded from this study due to the disparity in which men and women experience eating and weight-related concerns, as well as the dearth of questionnaires in this area that have been standardized on mixed gender or male samples. This exclusion occurred upon data entry in both the intervention and wait-list control groups, as the data of male employees was desired for the Healthy for Life general data base and future studies. Hence, male employees were permitted participation and were not notified of their exclusion from the data analysis.

Further exclusion criteria were diagnoses of full-syndrome Anorexia Nervosa (AN) or Bulimia Nervosa (BN), as measured by the Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz et al., 1997). These exclusion criteria were selected due to the insufficiency of the Eat for Life program for meeting the needs of individuals with immediately or potentially life-threatening eating pathology. As noted previously (see Participant section), two individuals who enrolled for Eat for Life (both in the wait-list control condition) met the criteria for full syndrome eating disorder diagnoses. These individuals were notified via email by a licensed psychologist (i.e., the creator of the Eat for Life program) of their ineligibility for participation in the study upon receipt of their pre-questionnaires. They were also provided with referrals for eating disorder treatment services. These individuals were not encouraged to withdraw from participation in the Eat for Life program, but rather to seek concurrent services. However, neither individual participated in the program.
Finally, evidence of significant medical concerns, active thought disorder, severe mood disorder, or preparation for Bariatric surgery were selected as exclusion criteria due to the insufficiency of the Eat for Life program for meeting the needs of individuals with potentially life-threatening medical or psychiatric concerns. No individuals were excluded from the study due to evidence of these conditions.

**Intervention.** As described previously, *Eat for Life* is a 10-week, psychoeducational group intervention. The class meets weekly for 1 to 1.5 hours and the average class size is 25 members. Class members receive *Intuitive Eating* (Tribole & Resch, 1995), *Breaking Free from Emotional Eating* (Roth, 1993), the *Eat for Life* program manual, and a CD of recorded meditations at the beginning of the course (See Appendix A for information on obtaining manual and CD).

Each of the *Eat for Life* classes consists of an integration of practice and discussion of mindfulness and intuitive eating skills. The classes begin with formal mindfulness practice, then progresses to group check-in, and ends with a lecture on the topic of the week (e.g., noticing and honoring the body’s internal hunger cues). Participants are given weekly homework assignments that include readings from the books and articles on selected topics, mindfulness practices from the CD of recorded meditations, and one of the “BASICS of mindful eating” (original tools of mindful eating developed by the *Eat for Life* creator) to focus on for the week.

The formal mindfulness practices that begin each class are a compilation of exercises from Mindfulness-based Stress Reduction (Kabat-Zinn, 1982), Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999), the Mindful Eating
and Living program (MEAL; Shelley, 2009) and original practices developed by the creator of *Eat for Life*. They include sitting meditation, the body scan, eating meditation, a short centering meditation called a “Taste of Mindfulness,” and variations of loving kindness meditation. The intuitive eating skills were adapted from *Intuitive Eating* (Tribole & Resch, 1995).

Two instructors taught the *Eat for Life* classes utilized in the intervention group data (i.e., creator of the Eat for Life program and a doctoral student trained for one year to administer the *Eat for Life program*). To ensure fidelity of program administration, the two instructors met for 1 to 1.5 hour supervision sessions weekly.

Again, readers can see Appendix A for information on obtaining the *Eat for Life* manual, which includes a complete description of the BASICS, homework assignments, and the integrated mindfulness and intuitive eating skills taught in the class.

**Statistical Analyses**

In order to adequately discuss the statistical analyses utilized, the research questions and proposed analyses are listed together below:

1. Participants in the *Eat for Life* condition will demonstrate significantly greater scores on the dependent variables (Intuitive Eating, Mindfulness, Body appreciation, and Eating Disorder Category) than those in the wait-list control group.

   a. One-way between-groups ANCOVAs were conducted on each of the three continuous dependent variables: intuitive eating, mindfulness, and body appreciation. Due to the non-random assignment of participants in the study, scores on the pre-ten weeks questionnaires were used as covariates in the analysis. The independent variable
was the type of intervention (two levels: *Eat for Life* condition and wait-list control condition) and the dependent variable consisted of post-ten weeks scores on intuitive eating, mindfulness, and body appreciation.

b. Because scores on the Intuitive Eating scale were significant in the above referenced ANCOVA, subscale scores on this same scale were further examined with additional one-way ANCOVAs. The same analyses were also performed for the Mindfulness Scale; because the total score was significant in the above-referenced ANCOVA, subscale scores were examined by using additional one-way ANCOVAs.

c. The categorical dependent variable (i.e., disordered eating category) was analyzed with ordinal regression. Differences between the intervention and wait-list control groups’ post-ten week scores was analyzed to determine if the intervention group evidenced greater change in disordered eating category than the wait-list control group, controlling for baseline scores. A Chi-square test for independence was also conducted to assess for the proportion of participants in asymptomatic, symptoms, and eating disorder categories in each group at post-ten weeks.

2. Increases in Mindfulness will mediate the relationship between Group (e.g., *Eat for Life* condition or wait-list control group) and the other dependent variables (e.g., Intuitive Eating, Body Appreciation, and Eating Disorder Category).
a. Structural equation modeling was used to determine whether mindfulness mediates the relationship between group and the other two continuous dependent variables (i.e., intuitive eating and body appreciation).

b. Ordinal regression was used to determine if mindfulness mediates the relationship between group and the categorical dependent variable (i.e., eating disorder category).
Chapter Four: Results

This chapter will describe and summarize the results of the statistical analyses used to evaluate the hypotheses of this study. First, the results of the preliminary analyses will be outlined, including data cleaning, missing data analysis, and tests of assumptions (i.e., normality, linearity, homogeneity of regression slopes, sample size, outliers). Results of the Student’s $t$ tests and Chi-square test of independence that examined possible baseline differences between the intervention and wait-list control groups in dependent variables (i.e., body appreciation, intuitive eating, mindfulness, and eating disorder category), demographic variables, and indicators of symptom severity will also be reported. Next, the major hypotheses of the study will be delineated, followed by the results of each analysis conducted to evaluate the hypotheses. This will include the results of the central hypothesis (i.e., that participants in the *Eat for Life* condition will demonstrate significantly greater scores on intuitive eating, mindfulness, body appreciation, and eating disorder category) than those in the wait-list control group, as well as of the meditational analyses. Finally, post-hoc analyses will be described.

Preliminary Analyses

Data Entry and Cleaning. The intervention group data was double-entered to promote accuracy of data entry, and a comparison analysis was conducted to locate the differences between the two data files. Upon the initial comparison analysis, 246 differences were found between the data files. Each of these differences was satisfactorily resolved by the primary investigator. A final comparison analysis
demonstrated no differences between the data files. The wait-list control data was downloaded from the online survey engine and converted to an Excel file. The file was then downloaded to the SPSS statistical program and examined visually for accuracy of data entry.

**Missing data analysis.** A missing data analysis was performed with the pre-post data from the 124 intervention and wait-list control group participants. Missing items were located and replaced with the imputed expectation maximization value estimated from each questionnaire. Participants who missed more than three items across all questionnaires were not included in the analyses. The number of items replaced on each questionnaire, across all subjects, was as follows: a) six on the Body Appreciation Scale; b) 13 on the Intuitive Eating Scale; c) 33 on the Five-Facet Mindfulness Questionnaire.

**Tests of assumptions.** Prior to conducting the major hypothesis analyses, the data was checked for violation of assumptions. Tests of normality and linearity were performed on each of the continuous dependent variables (i.e., body appreciation, intuitive eating, and mindfulness) via visual assessment of histograms and line graphs. Each of these dependent variables met the assumptions of normality and linearity. Tests of the assumption of homogeneity of regression slopes, which test for interactions between covariates (i.e. pre-ten weeks scores on the dependent variables) and the dependent variables, were not needed in this case, due to the obvious interaction between pre- and post-ten weeks scores. Finally, the categorical variable (i.e., eating
disorder category) was assessed for the assumptions of sufficient sample size and the presence of outliers, and met both of these assumptions.

**Baseline differences.** A series of independent samples t-tests were conducted to determine if there were baseline differences on the continuous dependent variables scores (i.e., body appreciation, intuitive eating, and mindfulness) between the intervention and wait-list control groups. There were no significant differences between groups on baseline scores for any of the continuous dependent variables.

A Chi-square test of independence was used to determine if there were baseline differences between the intervention and wait-list control groups on the categorical dependent variable (i.e., eating disorder category). The full model containing both intervention and wait-list control group eating disorder category scores was not statistically significant, $\chi^2 (1, N = 124) = 1.24, p = 0.52$. Hence, there were no significant differences between groups on baseline eating disorder category.

In addition to the outcome variables, t tests and Chi-square tests of independence were used to determine if there were baseline differences on demographic variables, including age, ethnicity, and education, and indicators of symptom severity, including weight category, estimated percentage of lifetime dieting, and whether they had contemplated bariatric surgery. There were no significant differences between groups’ baseline scores on any of the demographic or symptom severity indicators.
**Major Hypotheses**

The following section will outline the hypotheses of the study, followed by the results of each analysis used to evaluate the hypotheses.

1. Participants in the *Eat for Life* condition will demonstrate significantly greater scores on the dependent variables (Intuitive Eating, Mindfulness, Body appreciation, and Eating Disorder Category) than those in the wait-list control group.

   a. One-way between-groups ANCOVAs were conducted on each of the three continuous dependent variables: intuitive eating, mindfulness, and body appreciation. Although there were no significant differences in baseline scores between the intervention and wait-list control groups on these variables, pre-ten weeks scores were used as covariates in the analyses due to the non-random assignment of participants in the study. In addition, as differences between the two groups on baseline mindfulness scores approached significance (*p* = .054), it was determined to be appropriate to co-vary on pre-ten weeks scores for all ANCOVAs.

   After controlling for pre-ten weeks scores, there were significant differences between the intervention and wait-list control groups on all continuous dependent variables at post-ten weeks. Specifically, there was a significant difference between groups on body appreciation scores, *F*(1, 121) = 40.17, *p* < .01, partial eta squared = .25. Next, there was a significant difference

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1 Intent-to-treat (ITT) analyses demonstrated comparable significance levels for Intuitive Eating, Mindfulness, and Body Appreciation, with slightly smaller effect sizes (Partial eta squared: IE; .15, BAS; .13, FFMQ; .09). Eating Disorder Category did not reach significance; however, the most conservative of ITT analyses were conducted.
between groups on intuitive eating scores, $F(1, 121) = 67.44, p < .01$, partial eta squared = .36. Finally, there was a significant difference between groups on mindfulness scores, $F(1, 121) = 30.50, p < .01$, partial eta squared = .20. As seen in Table 4, at post-ten weeks, average scores on body appreciation, intuitive eating, and mindfulness were significantly higher in the intervention group than the wait-list control group.

b. Sub-scale scores on both intuitive eating and mindfulness were further examined with additional one-way ANCOVAs. There were significant differences between groups on each of the three intuitive eating subscales (Permission, Physical Eating, and Reliance) at post-ten weeks. Permission demonstrated the largest effect size ($F(1, 121) = 72.01, p < .01$, partial eta squared = .37), followed closely by Physical Eating, ($F(1, 121) = 33.36, p < .01$, partial eta squared = .22), and Reliance ($F(1, 121) = 29.81, p < .01$, partial eta squared = .19). As seen in Table 5, at post-ten weeks, average scores on each of these subscales was significantly higher for participants in the intervention group than in the wait-list control group, controlling for baseline scores.

Next, there were significant differences between groups at post-ten weeks on four of the five mindfulness subscales (i.e., Observing, Act with Awareness, Nonjudging, Nonreactivity). As seen in Table 6, at post-ten weeks, average scores on these four subscales was significantly higher for participants in the intervention group than in the wait-list control group. However, the Describing subscale did not demonstrate significance between groups at post-
ten weeks. Observing demonstrated the largest effect size \( F (1, 121) = 27.46, p < .01, \) partial eta squared = .18, followed narrowly by Act with Awareness \( F (1, 121) = 22.81, p < .01, \) partial eta squared = .16). Nonjudging \( F (1, 121) = 13.26, p < .01, \) partial eta squared = .10 and Nonreactivity demonstrated medium effect sizes \( F (1, 121) = 7.71, p < .01, \) partial eta squared = .06). Describe demonstrated a small, nonsignificant effect \( F (1, 121) = 3.62, p = .06, \) partial eta squared = .03.

c. The categorical dependent variable (i.e., disordered eating category) was analyzed with ordinal regression. Differences between the intervention and wait-list control groups were analyzed to determine if the intervention group evidenced greater change in disordered eating category than the wait-list control group, controlling for baseline categorization. Taking into account pre-ten weeks differences, participants in the intervention group demonstrated significantly greater odds of being asymptomatic at post-ten weeks than those in the wait-list control group. Specifically, the odds ratio was 3.65 \( (p < .01), \) indicating that participants in the intervention group had 265% higher odds to report being asymptomatic than symptomatic (and 265% higher odds to report being symptomatic than eating disordered) than those in the wait-list control group, controlling for baseline differences in the model.

As seen in Table 7, a Chi-square test for independence indicated a significant association between treatment group and eating disorder category (i.e., asymptomatic, symptomatic, and eating disordered), \( \chi^2 (2, n = 124) = 7.13, \)
p < .05. At post-ten weeks, 73.58% of the intervention group was asymptomatic, whereas only 50.70% was asymptomatic in the wait-list control group. Further, approximately 49.29% of the wait-list control group demonstrated eating pathology (i.e., symptomatic or eating disordered) at post-ten weeks, whereas only 26.41% of the intervention group had pathology. Specifically, almost 33.80% of the wait-list control group was symptomatic at post-ten weeks, whereas only 15.09% of the intervention group was symptomatic. Further, 15.49% of the wait-list control group was eating disordered at post-ten weeks and 11.32% were eating disordered in the intervention group. Refer back to Table 3 to compare these percentages to those of the intervention and wait-list control group at pre-ten weeks. Chi-square analyses at pre-ten weeks found no significant difference between the groups on eating disorder category (p = 0.52).

2. Increases in Mindfulness will mediate the relationship between Group (e.g., Eat for Life condition or wait-list control group) and the other dependent variables (e.g., Intuitive Eating, Body Appreciation, and Eating Disorder Category).

a. Structural equation modeling was used to determine if mindfulness mediates the relationship between group and the other two continuous dependent variables (i.e., intuitive eating and body appreciation). The analyses were conducted using AMOS Version 7.0 (Arbuckle, 2006). Significance was set at an alpha of 0.05. Group was created as an observed variable, Mindfulness as a latent mediator variable, and Body Appreciation and Intuitive Eating as outcome variables. The standardized direct paths between Body Appreciation and Mindfulness (β = .34)
and Group and Mindfulness ($\beta = .34$) were both statistically significant ($p < .01$). Results from boostrapping analyses indicated the 95% confidence interval for the estimate of the standardized indirect effect did not contain 0 (.06, .18). Thus, the indirect effect ($\beta = .11$) was statistically significant, indicating that mindfulness partially mediated the relationship between Group and Body Appreciation. Next, the standardized direct paths between Intuitive Eating and Mindfulness ($\beta = .31$) and Group and Mindfulness ($\beta = .34$) were both statistically significant ($p < .01$). Results from boostrapping analyses indicated the 95% confidence interval for the estimate of the standardized indirect effect did not contain 0 (.06, .17). Thus, the indirect effect ($\beta = .10$) was statistically significant, indicating that mindfulness partially mediated the relationship between Group and Intuitive Eating.

b. Ordinal regression was used to determine if mindfulness mediates the relationship between group and the categorical dependent variable (i.e., eating disorder category). As described above, participants in the intervention group demonstrated significantly greater odds (3.65) of being asymptomatic at post-ten weeks than those in the wait-list control group ($p < .01$). When mindfulness was entered into the model, the odds ratio was slightly reduced (3.25), though the significance level between groups remained significant. Hence, mindfulness had a small effect as a partial mediator of the relationship between group and eating disorder category at post-ten weeks.
Post-hoc Analyses

Due to 25% attrition in the Eat for Life program, post-hoc analyses were conducted to determine if there were significant baseline differences between intervention group participants who dropped the program (i.e., participants who missed at least six classes or who actively informed the instructor of their dropping the course; N = 23) and those who remained in the program (N = 70).

A series of independent t-tests were utilized to determine possible differences on demographic variables (i.e., age, ethnicity, education level), indicators of symptom severity (i.e., percentage of lifetime dieting, weight category), and the continuous outcome variables (i.e., body appreciation, intuitive eating, and mindfulness). There were no significant differences between participants who dropped the program and those who remained in the program on any of these variables at baseline.

A Chi-square test of independence was used to determine if there were baseline differences between these participants on the categorical dependent variable (i.e., eating disorder category). The full model containing both groups’ eating disorder category scores was not statistically significant, $\chi^2 (1, N = 93) = 0.51, p = 0.87$. Hence, there were no significant differences between groups on eating disorder category at baseline.
Chapter Five: Discussion

The purpose of this study was to examine the efficacy a novel community-based intervention for adult women with a range of eating and weight-related concerns. The intervention, called *Eat for Life*, combines intuitive eating and mindfulness-based approaches to assist participants in re-learning a healthy, sustainable relationship with food and their bodies. This quasi-experimental study sought to examine whether, when compared to women in a wait-list control group, women enrolled in the *Eat for Life* intervention would exhibit greater scores on intuitive eating, body appreciation, and mindfulness, as well as lower scores on disordered eating at post-ten weeks. This study also examined the role of mindfulness as a possible mediator of differences between groups on the other outcome variables (i.e., intuitive eating, body appreciation, and disordered eating). This chapter discusses the results of this study that were presented in Chapter Four. First, the results of the study are summarized and discussed in relation to previous literature; such discussion is presented by study hypotheses. Next, theoretical implications for Intuitive Eating and Mindfulness theories are discussed. Then, limitations of the study are reviewed. Finally, suggestions for future research are outlined, as are implications for preventative and remedial counseling interventions.

Summary of Results and Relationship to Previous Literature

The *Eat for Life* intervention combines the Intuitive Eating approach outlined by Tribole and Resch (1995), with mindfulness-based approaches. While there have been some outcome studies on mindfulness-based approaches to eating and weight-related issues, this is the first intervention study pertaining to Tribole and Resch’s (1995)
Intuitive Eating approach, as well as the first intervention study examining this intervention when combined with a mindfulness-based intervention. As such, the results of this study will be compared with studies of interventions most similar in content to the aforementioned Intuitive Eating approach, called the Non-Diet or Healthy-at-Every-Size (HAES) approaches. Likewise, results will be compared with previous mindful eating intervention studies that were influential in the development of Eat for Life. Such comparisons will be made in terms of the outcome variables: intuitive eating, disordered eating, body appreciation and mindfulness. These comparisons will be outlined under Hypothesis One. Then, given that this is the first of the aforementioned mindful eating studies to formally examine the mediational effect of mindfulness, this aspect of the study will be discussed in context of the one prior correlational study pertaining to mindfulness.

**Hypothesis one.** The first hypothesis in this study pertained to changes in dependent variables for those in the Eat for Life Intervention. Specifically, it was hypothesized that participants in the Eat for Life condition would demonstrate significantly greater scores at post-10 weeks on the dependent variables (Intuitive Eating, Body appreciation, Eating Disorder Category, and Mindfulness) than those in the wait-list control group. The results of the major analyses indicated that, controlling for pre-10 week differences, participants in the Eat for Life condition and wait-list control condition were significantly different at post-10 weeks, such that those in the Eat for Life condition demonstrated significantly greater scores on all outcome variables (Intuitive Eating, Body appreciation, Eating Disorder Category, and Mindfulness) than
participants in the wait-list control condition at post 10-weeks. Furthermore, the post-10 week differences between the two conditions on each of the outcome variables were considered large, as determined by their effect sizes (Cohen, 1988).

As noted earlier, because the Eat for Life intervention was based on both an Intuitive Eating approach and a Mindfulness-based approach, appropriate comparisons include both types of studies. The current findings are consistent with the results of the six known studies (presented in eight published articles) of the Non-Diet or Healthy-at-Every Size (HAES) interventions (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). These interventions are similar to the Intuitive Eating approach, in that they teach an internally-focused manner of eating and relating with the body. The current findings can also be compared with the results of four studies of mindfulness-based interventions for the treatment of eating and weight-related concerns: the Mindful Eating and Living Program (MEAL; Shelley, 2009) for obesity, Mindfulness-based Eating Awareness Training (MB-EAT; Kristeller & Hallett, 1999) for Binge Eating Disorder, an adaptation of MBSR for sub-threshold Binge Eating Disorder (Smith et al., 2006), and Mindfulness-based Cognitive Therapy (MBCT; Baer et al., 2006) for full-syndrome and sub-threshold Binge Eating Disorder. These studies were important influences in the development of the current intervention, due to the strong, MBSR-based mindfulness training component in each of the interventions (Kabat-Zinn, 1982), as well as the range of disordered eating and weight-related concerns that were targeted (e.g., eating disorders, sub-threshold disordered eating, and obesity).
**Intuitive eating.** No prior mindfulness-based interventions have utilized the variable of intuitive eating as an outcome variable. However, prior Non-Diet and HAES interventions examined changes in a similar construct. Specifically, although the Non-Diet and HAES studies have varied widely in design and particular outcome variables, a common outcome of each of these intervention studies was a significant decrease in participants’ levels of adverse dieting behaviors and consequences (e.g., restriction and emotional eating), as well as increases in an unrestrained, internally-focused style of eating (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Provencher et al., 2007; Provencher et al., 2009; Roughan et al., 1989). The finding of the current study that participants in the *Eat for Life* intervention demonstrated significant improvements on Intuitive Eating, as compared to those in the wait-list control group, is consistent with these results. Specifically, participants in the *Eat for Life* condition reported significantly greater scores on each of the three Intuitive Eating subscales (e.g., Permission, Physical Eating, and Reliance). As with the Non-Diet and HAES studies, these subscales reflect decreased restrictive and emotional eating, as well as increased eating based on internal hunger and satiety cues.

**Body appreciation.** None of the previous studies of mindfulness-based interventions used in the development of *Eat for Life* utilized body satisfaction as an outcome variable, and therefore, the finding that participants in *Eat for Life* reported significantly greater scores on Body Appreciation compared to the wait-list control group is unable to be compared to such prior mindfulness-based intervention studies. On the other hand, in each of the Non-Diet and Healthy-at-Every Size intervention
studies that tested for additional psychological variables, participants also demonstrated significant and sustained increases in body and self-acceptance (Bacon et al., 2002; Bacon et al., 2005; Carrier et al., 1994; Ciliska, 1998; Omichinski & Harrison, 1995; Roughan et al., 1989). The current study’s finding that participants reported significantly greater body appreciation at post-intervention is consistent with these results.

**Eating disorder category.** Both prior mindfulness-based intervention research and prior Non-Diet and HAES interventions have examined eating disorder variables as outcomes. The finding that participants in the *Eat for Life* condition decreased disordered eating (e.g., significantly greater scores on Eating Disorder Category on the Q-EDD, Mintz et al., 1997) is consistent with the results of two of the studies on mindfulness interventions for disordered eating (Kristeller & Hallett, 1999; Smith et al., 2006), while a third study of a mindfulness-based disordered eating intervention demonstrated only mixed results (Baer et al., 2006). Specifically, participants in the former studies demonstrated decreased binge eating behavior, as did participants in the current study. Similarly, of the two Non-Diet and Healthy-at-Every-Size intervention studies that utilized formal, standardized eating disorder questionnaires as an outcome variable (Bacon et al., 2002; Bacon et al., 2005; Ciliska, 1998), both studies demonstrated decreased scores on Bulimia subscales and scales that measured restraint (e.g., dieting behaviors) and disinhibition (e.g., over-eating or binge eating). The current finding that participants in the *Eat for Life* condition had significantly decreased scores
on disordered eating, which included binge eating and symptomatic chronic dieting, compared to those in the control group, is consistent with these results.

**Mindfulness.** No prior Non-Diet or HAES based interventions have utilized the variable of mindfulness as an outcome variable. However, prior mindfulness-based eating and weight-related interventions examined changes in this construct. The finding in the current study that participants in the *Eat for Life* condition reported significant increases in mindfulness is consistent with each of the three published studies on mindfulness-based eating interventions that reported mindfulness scores (Baer et al., 2006; Kristeller & Hallett, 1999; Smith et al., 2006).

**Hypothesis two.** The second hypothesis in this study pertained to the mediational effects of mindfulness. Specifically, it was hypothesized that mindfulness would mediate the relationship between Group (*Eat for Life* condition or wait-list control group) and the other outcome variables (e.g., intuitive eating, body appreciation, and disordered eating category). Results of meditational analyses indicated that mindfulness served as a partial mediator for the relationship between group and intuitive eating and body appreciation at post-ten weeks. Further, although it demonstrated a smaller effect, mindfulness also served as a partial mediator for the relationship between group and disordered eating category. Because no prior intervention studies utilized formal meditational analyses in their designs, this aspect of the current study is not directly comparable to prior research. However, two prior studies of the effects of a mindfulness-bases intervention on binge eating (Kristeller & Hallett, 1999; Smith et al., 2006) utilized correlational analyses to assess for a
relationship between increases in mindfulness and decreases in binge eating. These studies demonstrated mixed results for the importance of mindfulness in improvements in binge eating, with one of the studies demonstrating a significant relationship between mindfulness and decreases in binge eating (Kristeller & Hallett, 1999), and the other not finding such a relationship (Smith et al., 2006). However, the authors of the latter study relate this lack of correlation to their small sample size (N = 25). As such, the current finding fits with preliminary findings of the importance of mindfulness for changes in eating concerns.

**Implications for Intuitive Eating and Mindfulness Theory**

The results of this study have important implications for both Intuitive Eating and Mindfulness Theory. Each will be described separately below.

**Intuitive eating theory implications.** Intuitive Eating theory (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995) asserts that individuals develop disordered eating behaviors, body dissatisfaction, and overweight/obesity due to eating and relating with their bodies based on external cues (i.e., diet programs, the media), rather than internal cues. The theory suggests that if people can re-learn how to eat based on internal hunger and satiety cues, move their bodies because it feels good, and appreciate their bodies based on how they feel, individuals can develop a positive, sustainable relationship with food and their bodies. Specifically, with these skills, individuals are theorized to decrease disordered eating behaviors, engage in appropriate physical activity, establish a weight that is fitting for their bodies, and decrease body
dissatisfaction. Notably, unlike diet programs, these changes are theorized to be sustainable.

The design of the current study enables the findings to support several components of this theory, while other aspects are unable to be evaluated. First, the finding that participants in the Eat for Life condition demonstrated significantly increased intuitive eating, decreased disordered eating, and increased body appreciation, as compared to those in the wait-list control group, may point to the aforementioned tenet that learning to eat and relate with the body intuitively, as was taught in the Eat for Life program, may contribute to decreased disordered eating and body dissatisfaction. Although meditational analyses would be necessary to discuss any causal relationship between improvements in intuitive eating and the other two outcomes, the controlled design of the study points to preliminary support for an intuitive-eating program contributing to decreased disordered eating and improved body appreciation. Further, these findings support previous correlational studies that demonstrated a negative relationship between an intuitive eating style and both eating disorder (ED) symptomology (Tylka, 2006; Tylka & Wilcox, 2006) and body dissatisfaction (Tylka, 2006).

As the current study did not incorporate body mass index (BMI) or physical activity as outcome variables, the other tenets of Intuitive Eating theory are unable to be evaluated in light of the findings of the current study. Further, as the study did not contain a follow-up assessment, the assertion that individuals develop a sustainable positive relationship with food and their bodies cannot be supported. Future studies
could incorporate these additional outcome measures and longer-term follow-ups to examine these aspects of the theory.

**Mindfulness theory implications.** Mindfulness is defined as the practice of “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994, p. 4). Mindfulness theory suggests that intentionally attending to life with a non-judgmental stance can enhance individuals’ self-regulation abilities, increase exposure (and therefore decrease reactivity) to negative emotional stimuli, clarify values, enhance attitudinal qualities of acceptance, and increase behavioral flexibility (Shapiro et al., 2006). It appears that the self-regulatory, exposure, and acceptance components of mindfulness are the primary components that justify the use of mindfulness-based interventions in the treatment of eating and weight-related concerns (Kristeller et al., 2006). Briefly, it is theorized that as disordered eating is a means by which individuals attempt to regulate their emotions, the practice of present-moment awareness can help expose individuals to their emotions and decrease reactivity to them. Moreover, it is theorized that the formal mindfulness practices that are taught in mindfulness programs (i.e., sitting meditation, yoga) will help participants gain skill in becoming aware of their internal and external lives, which will result in increased self-regulation. Further, the attitude of acceptance is theorized to help individuals decrease their resistance to their problematic thoughts, emotions, and behaviors, and therefore increase their ability to change (Kristeller et al., 2006; Smith et al., 2006).
The results of the mediation analyses in the current study that showed mindfulness to be a partial mediator of greater scores on body appreciation and intuitive eating, as well as lower scores on disordered eating at post-ten weeks for the intervention group provides preliminary support for the theory that mindfulness can be a helpful component in eating and weight-related interventions. Regarding the aforementioned theory of the mechanisms of mindfulness in eating interventions, it is notable that the Observing and Acting with Awareness subscales of the Five-Facet Mindfulness Questionnaire demonstrated the largest effect sizes at post-10 weeks. These facets measure the ability to be attentive to internal and external stimuli and to act with conscious awareness of one’s behaviors. These results may fit with the theorized self-regulatory and exposure mechanisms of mindfulness in improving eating behaviors. Specifically, participants may have benefitted from bringing more awareness to their reasons for eating (i.e., physical hunger or emotional distress), which could have had a self-regulatory function in decreasing their typical disordered eating patterns. Further, increased awareness may have also led to decreased reactivity to negative beliefs and emotional patterns related to their bodies. Future meditational research could ascertain what facets of mindfulness were most important in the improvement of eating and weight-related concerns. Additionally, research employing larger samples and structural equation modeling could potentially shed light on a theoretical model that combines the influence of mindfulness and intuitive eating on increased body image, decreased disordered eating and perhaps other weight and body-image variables, such as BMI and internalization of cultural ideals to name a few.
Limitations

There are several limitations influencing the internal and external validity of this quasi-experimental study. The first and most central limitation is the self-selection of participants to the intervention and wait-list control groups, rather than random assignment. While no significant differences were found between the groups at pre-ten weeks on any demographic or outcome variable, and pre-ten week scores were utilized as covariates to enhance statistical rigor in all major analyses, random assignment would have been a more ideal design to control for between-group differences. A second limitation is the lack of an active control group, which limits the conclusions one can make from the results of the study. Specifically, if intervention group participants were compared to a traditional diet program, more definitive conclusions could be made about its superiority to this standard form of weight-loss treatment. However, as *Eat for Life* is unique in targeting a wide range of eating and weight-related pathology (rather than either obesity or eating disorders, as is most common in other interventions), the availability of an appropriate comparison intervention was limited. Future studies could compare *Eat for Life* to two active control groups, a traditional diet program and a traditional eating disorder intervention. A third limitation refers to the short length of time between the pre- and post-questionnaires and lack of a longer-term follow-up. This methodology may limit the degree of change that can be observed in either group or over-inflate the initial improvements made by the intervention group upon completion of *Eat for Life*. Now that the initial efficacy of *Eat for Life* has been established, future studies should address longer-term effects. Next, the significant
attrition rate (e.g., 25%) of the *Eat for Life* intervention should be noted as a limitation. While post-hoc analyses revealed no significant differences between the participants who dropped out of the program and those who remained in the program on any demographic or outcome variable at pre-intervention, it is possible that the two groups differed in some aspect that was not measured. Future studies should examine those who drop out more closely. Additional limitations include the self-report nature of the data and sampling from a university system in a single region of the United States (e.g., the Midwest). However, the sound psychometric properties of each of the self-report measures used in the study, as well as the broad sampling from multiple universities, partially mitigates these effects.

**Implications for Future Research**

To further elucidate the efficacy of the *Eat for Life* intervention, future studies should consider mitigating the effects of the aforementioned limitations by utilizing random assignment, active control groups, and follow-up assessments. First, randomly assigning participants to either the intervention or control group would greatly enhance the scientific rigor of the study and expand the conclusions that could be made about the efficacy of the *Eat for Life* intervention. In addition, as Intuitive Eating theory (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995) postulates that non-diet, internally-focused approaches are more effective than restrictive diet programs, comparing *Eat for Life* to a traditional diet program (i.e., Weight Watchers) as an active control could better examine this aspect of the theory. Finally, due to the assertion of Intuitive Eating theory that an internally-focused style of eating and relating to the body is more sustainable
than traditional diet programs, such future studies that compare *Eat for Life* with traditional diet approaches would certainly benefit from incorporating one or more longer-term follow-up assessments.

In addition to the studies in reference to the design limitations of the current study, future studies would benefit from incorporating additional outcome variables to further elucidate the efficacy of the *Eat for Life* intervention. For example, participants’ body mass index (BMI) was not utilized as an outcome variable in the current study, due to Intuitive Eating theory’s (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995) core assertion that participants benefit from a focus on internal indicators of health and well-being (e.g., how they feel), rather than external factors (e.g., weight). However, as Intuitive Eating theory (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995) suggests that intuitive eaters will restore a weight that is appropriate to their body’s needs and sustainable for them, it would be interesting to examine if *Eat for Life* contributes to significant and sustained changes (e.g., increases or decreases) in BMI over both the course of the intervention and importantly, at longer-term follow-up period. Importantly, in order to be consistent with Intuitive Eating theory and related spirit of the intervention, it would be important for the BMI data be obtained in as unobtrusive of a manner as possible. Additional health indicators could also be important to measure, such as blood pressure and blood glucose levels. Similarly, as Intuitive Eating theory (Gast & Hawks, 1998, 2000; Tribole & Resch, 1995) points to increased and sustainable physical activity as a possible result of an internally-oriented focus on...
movement, it could also be beneficial to incorporate a measure of physical activity in future studies.

In addition to additional outcome measures, it would also be interesting to understand more about the causal mechanisms of the improvements in the current outcome variables of intuitive eating, body appreciation, mindfulness, and disordered eating. Future studies could utilize the subscales of the Intuitive Eating Scale (Permission, Physical Eating, Reliance; Tylka, 2006) in mediation analyses for their role in improvements in body appreciation and decreased disordered eating. Studies could also expand upon the mediation analyses performed in the current study by individually examining the subscales of the Five-Facet Mindfulness Questionnaire (Observing, Acting with Awareness, Describing, Nonjudging of Inner Experience, Nonreactivity to Inner Experience; Baer et al., 2006). As mentioned earlier, the development of a theoretical model that incorporated both intuitive eating and mindfulness, in terms of their impact on eating, body image, and weight-related concerns, could be of great benefit. Future studies should also examine the efficacy of the *Eat for Life* intervention with more diverse samples, both in terms of gender and race/ethnicity. Specifically, as the sample of the current study was limited to female participants, future studies could expand upon this study by incorporating data from male participants. Due to the differing ways in which men and women experience eating and weight-related concerns, as well as the lack of available disordered eating and body perception inventories that have been standardized on mixed samples, it would be important for these studies to be intentional about utilizing appropriate questionnaires and methodologies to support
such a heterogeneous sample. In addition, as the current sample largely consisted of individuals who identified as Caucasian, it would be important for future studies to examine the efficacy of *Eat for Life* with individuals who identify as racial/ethnic minorities.

Finally, future studies could compare the current mode of administration of the *Eat for Life* program (i.e., in-person) with other methods of administration. Specifically, the in-person program could be compared with the online version of *Eat for Life* that is administered via the University of Missouri Blackboard system. Other possible studies could compare the in-person *Eat for Life* program with a version in which participants worked through the manual alone or with minimal intervention such as participation in a weekly or bi-weekly group support or limited phone or email contact with a study administrator. These studies could elucidate the relative importance of the *Eat for Life* instructors in the efficacy of the program, which could potentially aid in administering the program more widely and in a more cost-effective modality. Finally, studies in which the efficacy of various components of Eat for Life are isolated (e.g., exercises, homework, reading assignments) could be useful in developing as cost-effective an intervention as possible.

**Implications for Therapy and Prevention**

The results of the present study have important implications for the present state of available obesity, disordered eating, and body dissatisfaction interventions. First, as discussed in Chapter Two, many of the existing eating disorder and body dissatisfaction interventions have been standardized on homogenous samples of young
women (Agras et al., 2000(a), Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000(b); Fairburn, 2005; Jarry & Berardi, 2004; Shapiro et al., 2007). As the female participants in this study represented a range of ages and backgrounds, the efficacy of the Eat for Life intervention is a significant step towards creating community-based interventions for adult women to create positive relationships with food and their bodies. Second, along with being limited in the ages served, most prior eating and weight-related interventions have been limited in scope and target population. Specifically, most existing interventions target either obesity or full-syndrome eating disorders (Dingemans et al., 2002; Wilson et al., 2007). These uni-focused interventions do not address the interrelated nature of eating and weight-related concerns (e.g., obesity, disordered eating, and body dissatisfaction) (Mintz et al., 2007; Neumark-Sztainer et al., 2006). These interventions also discount the continuum of disordered eating patterns that exist in adult women in the community, including symptomatic disordered eating behaviors (Mintz et al., 1997). As such, the efficacy of the Eat for Life intervention in contributing to significantly decreased scores on disordered eating (including both full-syndrome EDNOS and sub-threshold disordered eating behaviors) and significantly greater scores on body appreciation, compared to the wait-list control group, points to the possibility of a more holistic form of intervention that can target the range of these interrelated concerns. Further, while participants’ BMI was not used as an outcome variable in this study, it is possible that participants’ increased internally-focused eating behaviors (i.e., intuitive eating) would result in decreases in weight over time for those who need to lose weight. This finding would be consistent with Intuitive Eating Theory
(Gast & Hawks, 1998, 2000; Tribole & Resch, 1995) and correlational studies that demonstrated the relationship between an intuitive eating style and lower BMI (Hawks et al., 2005; Smith & Hawks, 2006). As such, such a holistic intervention that effectively targets the interrelated issues of obesity, disordered eating, and body dissatisfaction could prove to be a cost-effective alternative to treating these inter-related difficulties with separate treatments.

The results of the current study point to intuitive and mindful eating interventions as possible beneficial alternatives to traditional forms of eating disorder and obesity treatments. As many eating disorder interventions are not efficacious for large subsections of their samples (Agras et al., 2000(a); Wilson et al., 2007) and the majority of obesity interventions result in only short-term weight loss and eventual regain (Mann et al., 2007; Miller, 1999), it seems important to understand the role of alternative methods of helping individuals to develop positive eating behaviors and attitudes towards their bodies. While this study did not utilize BMI as an outcome variable or incorporate follow-up studies to assess for the sustainability of changes, the significantly greater scores on body appreciation and decreased disordered eating, as compared to controls, provide preliminary support for how such methodologies can be utilized in the community.

Hence, as the Eat for Life program appears to be a potentially cost-effective alternative to traditional obesity, disordered eating, and body dissatisfaction interventions for community women, this intervention could be adapted to other settings. Specifically, as in the current study, Eat for Life could be incorporated in other
universities’ employee wellness programs. Such programs could be cost-effective for universities over the long-term by reducing costs associated with the psychological and physical consequences of the inter-related issues of obesity, disordered eating, and body dissatisfaction (i.e., costs associated with employee leave). In addition, *Eat for Life* could be adapted to assist employees in other non-academic workplaces and/or to be administered through community mental health agencies. As the program is relatively brief (e.g., ten sessions), *Eat for Life* could be reasonably inexpensive to administer in venues in which time and financial resources are limited. Furthermore, if necessary, *Eat for Life* could be shortened to be appropriate for these settings. One illustrative adaptation would be to decrease the group discussion components of the intervention and focus more solely on the didactic and experiential (i.e., meditation) components. Future studies could examine the efficacy of *Eat for Life* in these adapted forms, perhaps comparing them to the longer versions of the intervention.

Regarding prevention, efforts in the last decade have made important efforts to create holistic prevention programs by targeting obesity and eating disorders simultaneously, with body dissatisfaction as a targeted risk factor (Mintz et al., 2007; Neumark-Sztainer et al., 2006). The findings of the current study support these efforts to create holistic programs. While several psychoeducational programs have been found to be effective (Mintz et al., 2007), it may be of added benefit incorporate experiential training into such programs to help young people learn skills to become aware of the body’s internal hunger and satiety cues. For example, the obesity and eating disorder prevention program, *Planet Health* (PH; Gortmaker et al., 1999) which encourages
young girls to create behavioral changes (i.e., increase fruit and vegetable intake and physical activity) and has received support in decreasing weight-control behaviors (Austin, Field, Wiecha, Peterson, & Gortmaker, 2005), could benefit from adding skills training in an internally-focused, sustainable alternative to dieting (i.e., intuitive and mindful eating). Such training at a younger age could aid in preventing the development of restrictive dieting and over-eating behaviors, as well as lead to a more internally-driven relationship with the body (i.e., appreciation of how the body feels and what it does, rather than how it looks). Additionally, components of the *Eat for Life* program could be incorporated into the nutrition and health curriculums of primary and secondary education. In addition, the program could be administered as an after-school program for students who are at particular risk for disordered eating, obesity, or body dissatisfaction (i.e., young women). Future studies could examine the efficacy of the *Eat for Life* program in these adapted formats.

**Summary and Conclusions**

The current research is innovative in that it provides support for a new, holistic intervention for the spectrum of eating and weight-related concerns in adult women in the community. It is the first study of an intervention that combines two innovative paradigms, Intuitive Eating (Tribole & Resch, 1995) and Mindfulness, which are increasingly being discussed as supportive in the development of positive and sustainable methods of eating and relating with one’s body (Mathieu, 2009). Strengths of this study include strong ecological validity and its controlled, longitudinal design. Specifically, unlike many intervention studies, the present study did not include
numerous exclusion criteria or utilize a sample from only one demographic group (e.g., college women) with only one presenting concern (e.g., obesity or eating disorders). Rather, this study utilized a community sample of individuals with diverse ages and backgrounds who represented the range of concerns that are seen in society. Hence, the results of this intervention could be replicated in other communities, with efficiency and without the usual cost of in-depth pre-screening interviews. Further, the longitudinal and controlled design of this research allows for stronger conclusions to be made about the role of Eat for Life in any changes that participants may have experienced over time, as compared to those who did not participate in the intervention. Lastly, the mediation analyses used in the study allow for increased understanding of the importance of mindfulness training in this eating and weight-related intervention. As such, it is hoped that this study serves as a starting point for future use of and study of Eat for Life, a program which appears to be potentially quite useful and efficacious and in assisting individuals in developing positive relationships with food and their bodies.
Bibliography


Appendix A

Eat for Life Program Manual

As the Eat for Life Program manual is too large to be included in this paper, a complete copy of the manual can be found in the T.E. Atkins Healthy for Life program office at the University of Missouri. The manual includes outlines of the contents of each class, as well as the practice exercises and handouts given to participants each week. Copies of the CD of recorded meditations are also available. To obtain a copy of the manual and/or CD, please email Dr. Lynn Rossy at rossyl@umsystem.edu.
Appendix B

The Intuitive Eating Scale

Directions for participants: For each item, please circle the answer that best characterizes your attitudes or behaviors.

1. I try to avoid certain foods high in fat, carbohydrates, or calories.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

2. I stop eating when I feel full (not overstuffed).
   Strongly Disagree Disagree Neutral Agree Strongly Agree

3. I find myself eating when I’m feeling emotional (e.g., anxious, depressed, sad), even when I’m not physically hungry.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

4. If I am craving a certain food, I allow myself to have it.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

5. I follow eating rules or dieting plans that dictate what, when, and/or how much to eat.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

6. I find myself eating when I am bored, even when I’m not physically hungry.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

7. I can tell when I’m slightly full.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

8. I can tell when I’m slightly hungry.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

9. I get mad at myself for eating something unhealthy.
   Strongly Disagree Disagree Neutral Agree Strongly Agree

10. I find myself eating when I am lonely, even when I’m not physically hungry.
    Strongly Disagree Disagree Neutral Agree Strongly Agree
11. I trust my body to tell me when to eat.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

12. I trust my body to tell me what to eat.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

13. I trust my body to tell me how much to eat.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

14. I have forbidden foods that I don’t allow myself to eat.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

15. When I’m eating, I can tell when I am getting full.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

16. I use food to help me soothe my negative emotions.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

17. I find myself eating when I am stressed out, even when I’m not physically hungry.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

18. I feel guilty if I eat a certain food that is high in calories, fat, or carbohydrates.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

19. I think of a certain food as “good”or “bad” depending on its nutritional content.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

20. I don’t trust myself around fattening foods.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

21. I don’t keep certain foods in my house/apartment because I think that I may lose control and eat them.
1   2  3  4  5
Strongly Disagree Disagree Neutral Agree Strongly Agree

Note: Permission subscale: Items 1, 5, 9, 14, 18, 19, 20, 21, 4; Physical Eating: Items 3, 6, 10, 16, 17, 2; Reliance: Items 7, 8, 11, 12, 13, 15
Appendix C

The Body Appreciation Scale

Please indicate whether the question is true about you never, seldom, sometimes, often, or always.

1. I respect my body.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

2. I feel good about my body.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

3. On the whole, I am satisfied with my body.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

4. Despite its flaws, I accept my body for what it is.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

5. I feel that my body has at least some good qualities.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

6. I take a positive attitude towards my body.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

7. I am attentive to my body’s needs.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

8. My self worth is independent of my body shape or weight.
   1  2  3  4  5
   Never  Seldom  Sometimes  Often  Always

9. I do not focus a lot of energy being concerned with my body shape or weight.
1. My feelings toward my body are positive, for the most part.

2. I engage in healthy behaviors to take care of my body.

3. I do not allow unrealistically thin images of women presented in the media to affect my attitudes toward my body.

4. Despite its imperfections, I still like my body.

Appendix D
The Five-Facet Mindfulness Questionnaire

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>never or very rarely true</td>
<td>rarely true</td>
<td>sometimes true</td>
<td>often true</td>
<td>very often or always true</td>
<td></td>
</tr>
</tbody>
</table>

_____ 1. When I’m walking, I deliberately notice the sensations of my body moving.

_____ 2. I’m good at finding words to describe my feelings.

_____ 3. I criticize myself for having irrational or inappropriate emotions.

_____ 4. I perceive my feelings and emotions without having to react to them.

_____ 5. When I do things, my mind wanders off and I’m easily distracted.

_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____ 7. I can easily put my beliefs, opinions, and expectations into words.

_____ 8. I don’t pay attention to what I’m doing because I’m daydreaming, worrying, or otherwise distracted.

_____ 9. I watch my feelings without getting lost in them.

_____ 10. I tell myself I shouldn’t be feeling the way I’m feeling.

_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and
emotions.

12. It’s hard for me to find the words to describe what I’m thinking.

13. I am easily distracted.

14. I believe some of my thoughts are abnormal or bad and I shouldn’t think that way.

15. I pay attention to sensations, such as the wind in my hair or sun on my face.

16. I have trouble thinking of the right words to express how I feel about things

17. I make judgments about whether my thoughts are good or bad.

18. I find it difficult to stay focused on what’s happening in the present.

19. When I have distressing thoughts or images, I “step back” and am aware of the thought or image without getting taken over by it.

20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

21. In difficult situations, I can pause without immediately reacting.

22. When I have a sensation in my body, it’s difficult for me to describe it because I can’t find the right words.

23. It seems I am “running on automatic” without much awareness of what I’m doing.

24. When I have distressing thoughts or images, I feel calm soon after.

25. I tell myself that I shouldn’t be thinking the way I’m thinking.

26. I notice the smells and aromas of things.

27. Even when I’m feeling terribly upset, I can find a way to put it into words.
28. I rush through activities without being really attentive to them.

29. When I have distressing thoughts or images I am able just to notice them without reacting.

30. I think some of my emotions are bad or inappropriate and I shouldn’t feel them.

31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

32. My natural tendency is to put my experiences into words.

33. When I have distressing thoughts or images, I just notice them and let them go.

34. I do jobs or tasks automatically without being aware of what I’m doing.

35. When I have distressing thoughts or images, I judge myself as good or bad, depending on what the thought/image is about.

36. I pay attention to how my emotions affect my thoughts and behavior.

37. I can usually describe how I feel at the moment in considerable detail.

38. I find myself doing things without paying attention.

39. I disapprove of myself when I have irrational ideas.

Note: Observing subscale: Items 1, 6, 11, 15, 20, 26, 31, 36; Describing subscale: Items 2, 7, 12, 16, 22, 27, 32, 37; Acting with Awareness subscale: Items 5, 8, 13, 18, 23, 28, 34, 38; Nonjudging of Inner Experience subscale: Items 3, 10, 14, 17, 25, 30, 35, 39; Nonreactivity to Inner Experience sub-scale: Items 4, 9, 19, 21, 24, 29, 33
Appendix E

Questionnaire for Eating Disorder Diagnoses

Please complete the following questionnaire as honestly as possible. The questions refer to current behaviors and beliefs, meaning those that have occurred in the past 3 months.

Sex: (Please circle) Male Female

Age: __________

School/Occupational Status: (Please circle)
- Junior High or younger (specify grade: _____)
- High School Freshman
- High School Sophomore
- High School Junior
- High School Senior
- College Freshman
- College Sophomore
- College Junior
- College Senior
- Not in School/Employed (specify: )

Present height: _______ feet _________ inches

Present weight: _______ pounds

My body-frame is: small medium large (Please circle)

I would like to weigh _________ pounds.

1. Do you experience recurrent episodes of binge eating, meaning eating in a discrete period of time (e.g., within any 2-hour period) an amount of food that is definitely larger than most people would eat during a similar time period?

   YES       NO

   If YES: Continue to answer the following questions.
   If NO: Skip to Question #4 (on the next page)
2. Do you have a sense of lack of control during the binge eating episodes (i.e., the feeling that you cannot stop eating or control what or how much you are eating)?

YES  NO

3. Circle the answers within the **two** sets of **bold brackets** below that best fit for you:

On average, I have had **[1, 2, 3, 4, 5, 6 or more]** binge eating episodes a **WEEK** for at least

**[1 month, 2 months, 3 months, 4 months, 5 months, 6-12 months, more than one year: __________ (specify)]**

4. Please circle the appropriate responses below concerning things you may do **currently** to prevent weight gain. If you circle yes to any question, please indicate how often on the average you do this and how long you have been doing this.

a) **Do you make yourself vomit to prevent weight gain?**  YES  NO

*How often do you do this?*

Daily  Twice/Week  Once/Week  Once/Month

*How long have you been doing this?*

1 month  2 months  3 months  4 months  5-11 months  More than a year: __________ (specify)

b) **Do you take laxatives to prevent weight gain?**  YES  NO

*How often do you do this?*

Daily  Twice/Week  Once/Week  Once/Month

*How long have you been doing this?*

1 month  2 months  3 months  4 months  5-11 months  More than a year: __________ (specify)
c) Do you take diuretics (water pills) to prevent weight gain?  

**How often do you do this?**

Daily  Twice/Week  Once/Week  Once/Month

**How long have you been doing this?**

1 month  2 months  3 months  4 months  5-11 months  More than a year: ___________ (specify)

d) Do you fast (skip food for 24 hours) to prevent weight gain?  

**How often do you do this?**

Daily  Twice/Week  Once/Week  Once/Month

**How long have you been doing this?**

1 month  2 months  3 months  4 months  5-11 months  More than a year: ___________ (specify)

e) Do you chew food but spit it out to prevent weight gain?  

**How often do you do this?**

Daily  Twice/Week  Once/Week  Once/Month

**How long have you been doing this?**

1 month  2 months  3 months  4 months  5-11 months  More than a year: ___________ (specify)

f) Do you give yourself an enema to prevent weight gain?  

**How often do you do this?**

Daily  Twice/Week  Once/Week  Once/Month

**How long have you been doing this?**

1 month  2 months  3 months  4 months  5-11 months  More than a year: ___________ (specify)

g) Do you take appetite control pills to prevent weight gain?  

**How often do you do this?**

Daily  Twice/Week  Once/Week  Once/Month
**How long have you been doing this?**

1 month  2 months  3 months  4 months  5-11 months  More than a year: ____________ (specify)

h) **Do you diet strictly to prevent weight gain?**  YES  NO

**How often do you do this?**

Daily  Twice/Week  Once/Week  Once/Month

**How long have you been doing this?**

1 month  2 months  3 months  4 months  5-11 months  More than a year: ____________ (specify)

i) **Do you exercise a lot?**  YES  NO

**How often do you do this?**

Daily  Twice/Week  Once/Week  Once/Month

**How long have you been doing this?**

1 month  2 months  3 months  4 months  5-11 months  More than a year: ____________ (specify)

5. If you answered YES to “exercise a lot,” please answer questions #5a, 5b, 5c, & 5d. If you answered NO to “exercise a lot,” skip to question #6.

5a. Fill in the blanks below:

I ________________________________ (types of exercise, e.g., jog, swim) for an average of ______________ hours at a time.

5b. My exercise sometimes significantly interferes with important activities.

   YES  NO

5c. I exercise despite injury and/or medical complications.

   YES  NO

5d. Is your primary reason for exercising to counteract the effects of binges or to prevent weight gain?

   YES  NO
For the following questions, circle the response that best reflects your answer:

6. Does your weight and/or body shape influence how you feel about yourself?

1  2  3  4  5
Not at all  A little  A moderate  Very much  Extremely or Completely Amount

6. How afraid are you of becoming fat?

1  2  3  4  5
Not at all  A little  A moderate  Very much  Extremely or Completely Amount

7. How afraid are you of gaining weight?

1  2  3  4  5
Not at all  A little  A moderate  Very much  Extremely or Completely Amount

8. Do you consider yourself to be:

1  2  3  4  5  6
Grossly Moderately Overweight Normal Low Severely Obese Obese Weight Weight Underweight

9. Certain parts of my body (e.g., my abdomen, buttocks, thighs) are too fat.

YES  NO

10. I feel fat all over.

YES  NO

11. I believe that how little I weigh is a serious problem.

YES  NO

12. I have missed at least 3 consecutive menstrual cycles (not including those missed during a pregnancy).

YES  NO
Appendix F

Supplemental Questionnaire: Pre-Program

(Question Modified for Wait-List Control Group at Bottom)

Which ethnic group do you primarily identify with?

- Caucasian ________
- African American ________
- Latino / Latina ________
- Asian/ Pacific Islander ________
- Alaskan Native/Native American ________
- Bi/Multiracial ________
- Other (please specify): ___________________

Highest Grade or Degree: ____________

Eating/Dieting:

1. What is there about the way that you eat or your relationship with food that you would like to change?

________________________________________________________________________

________________________________________________________________________

2. As you look over your lifetime as an adult, what percentage of the time have you been on a diet or weight loss program? ________________%

3. What, if any, relationship do you see between your dieting and unhealthy eating (i.e. overeating, binge eating, restricted eating, etc.)

?______________________________

________________________________________________________________________

4. Have you ever considered weight reduction surgery such as lap band or gastric bypass (stomach stapling)? Yes___________ No ______________
Weight:

1. How would you describe your present weight? (Circle one)

Very overweight  Moderately overweight  Average  Moderately underweight  Very underweight

2. How satisfied are you with the way you look at your present weight? (Circle one)

Completely satisfied  Moderately satisfied  Neutral  Moderately dissatisfied  Very dissatisfied

3. At what weight do you think you would be most satisfied? __________

Exercise:

1. How frequently do you now exercise? 5-7 times/week  __________
   3-5 times/week  __________
   1-2 times/week  __________
   2 times/month  __________
   Rarely  __________
   Never  __________

2. What do you do for exercise? __________________________________________
   __________________________________________

3. How hard do you exercise? (Circle)

Not hard at all  Moderately  Very hard

1  2  3  4  5  6  7  8  9  10

4. What is the major reason you exercise?

Fun  __________
Weight Loss  __________
Fitness  __________
Social Activity  __________
Health  __________
Other  __________ (Please specify) ____________________________
A number of ways of attempting to lose weight are listed below. Please fill in the blanks.
(Only fill out before the program)

<table>
<thead>
<tr>
<th>Methods</th>
<th>Ages used</th>
<th>Number of times used</th>
<th>Maximum weight loss</th>
<th>Comments: Length of time wt. loss maintained; success; difficulties</th>
<th>Approx. cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOPS, self help</td>
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<td>Weight Watchers</td>
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<td>Wt. loss businesses</td>
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<td>Shots and pills</td>
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<tr>
<td>Medically supervised diet</td>
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<td></td>
</tr>
<tr>
<td>Unsupervised diet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not eating</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Psychotherapy</td>
<td></td>
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</tr>
<tr>
<td>Hypnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

What would you like to gain from this program?

1.  
_______________________________________________________________________
________________________________________________________________________

2.  
________________________________________________________________________
________________________________________________________________________
Pre-Program Supplemental Question Modified for Wait-List Control Group:

What would you like to gain from taking Eat for Life, if you decide to participate in the class after the ten week period?

1.

________________________________________________________________________
________________________________________________________________________

2.

________________________________________________________________________
________________________________________________________________________

3.

________________________________________________________________________
________________________________________________________________________
Appendix G

Supplemental Questionnaire: Post-Program

(Questions Modified for the Wait-List Control Group at Bottom)

Age: ______________ Gender: __________

Eating/Dieting:

1. What is there about the way that you eat or your relationship with food that you have changed over the past 10 weeks?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

2. As you look over the last 10 weeks, what percentage of the time have you been on a diet or weight loss program? _______________%

3. What, if any, relationship do you see between your dieting and unhealthy eating (i.e. overeating, binge eating, restricted eating, etc.)?
________________________________________________________________________
________________________________________________________________________

Weight:

1. How would you describe your present weight? (Circle one)

Very overweight  Moderately overweight  Average  Moderately underweight  Very underweight

2. How satisfied are you with the way you look at your present weight? (Circle one)

Completely satisfied  Moderately satisfied  Neutral  Moderately dissatisfied  Very dissatisfied

3. At what weight do you think you would be most satisfied? ___________
Exercise:

1. How frequently do you now exercise?  
   - 5-7 times/week  
   - 3-5 times/week  
   - 1-2 times/week  
   - 2 times/month  
   - 1 time/month  
   - Rarely  
   - Never  

2. What do you do for exercise?  
   ________________________________  
   ________________________________  

3. How hard do you exercise? (Circle)  
   Not hard at all 1 2 3 4  
   Moderately 5 6 7 8  
   Very hard 9 10  

4. What is the major reason you exercise?  
   Fun  
   Weight Loss  
   Fitness  
   Social Activity  
   Health  
   Other  (Please specify)  

What did you gain from this program?  

1.  
   ________________________________  
   ________________________________  

2.  
   ________________________________  
   ________________________________
3.   ________________________________________________________________

______________________________________________________________

Other comments:

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

Post-Program Supplemental Questions Modified for Wait-List Control Group

1. What, if anything, about the way that you eat or your relationship with food has changed over the past 10 weeks (e.g., since the last time you took a set of surveys in this study)?

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

1. Have you done anything in the past ten weeks to address your concerns with food, eating, or your body (e.g., begin or end a diet program, read a book about these topics, talk to a counselor, etc.)?

Yes ___

No ___

If you answered "No" please click Next at the bottom of the page and move on to the next survey.
2. If you answered “yes” to question #1 “did you do anything in the past ten weeks to address your concerns with food, eating, or your body), what did you do?

3. Do you believe your relationship with food, eating, or your body was improved in any way by what you did during the last ten weeks?

If you answered “No”, please click Next at the bottom of the page and move on to the next survey.

4. If you answered yes to question #3 (e.g., do you believe your relationship with food, eating, or your body was improved in any way by what you did during the last ten weeks), how did it help?
Appendix H

Recruitment Emails: Intervention and Wait-List Control Groups

Intervention Group:

This 10 week program uses mind-body practices (meditation and yoga) and the principles of intuitive eating as the foundation for learning how to create a healthy relationship with your food, mind, and body. If you have a history of yo-yo dieting or find yourself eating when you're stressed, bored, or unhappy, this may be the program for you. Mandatory orientation: XX. Classes on XX starting XX (5:30-7 p.m.). There is a $60 fee, $20 to be refunded if you attend 9 of 10 classes. **CLASS SIZE IS LIMITED.** Contact Hannah Bush at hegx88@mail.missouri.edu to enroll.

Wait-List Control Group:

We are seeking participants to complete two sets of online surveys over a ten week period as wait-list control participants in a study about the benefits of Eat for Life. As an incentive, you will be offered the Eat for Life class at a reduced fee in our next enrollment periods. Eat for Life is a 10 week program that uses mindfulness as the foundation for learning how to create a healthy relationship with your food, mind, and body. The course is available in person or as an online course. If you find yourself eating when you are stressed, bored, or unhappy, or have a history of yo-yo dieting, this may be the program for you. If you are interested, please email Hannah Bush at hegx88@mail.missouri.edu.
Table 1

Demographic Information for Intervention and Wait-list Control Groups (N = 124)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (53)</th>
<th>Wait-list Control (71)</th>
<th>Total (124)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>SD</td>
<td>11.25</td>
<td>11.48</td>
<td>11.30</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Caucasian         | 41                | 68                     | 109         | 87.9
| African American  | 7                 | 0                      | 7           | 5.6
| Latino            | 1                 | 1                      | 2           | 1.6
| Native American   | 0                 | 1                      | 1           | 0.8
| Bi/Multi-racial   | 2                 | 0                      | 2           | 1.6
| Other             | 1                 | 1                      | 2           | 1.6
| **Education**     |                   |                        |             |
| Ph.D.             | 3                 | 5                      | 8           | 6.5
| M.D./J.D./D.O     | 0                 | 3                      | 3           | 2.4
| Master’s          | 12                | 17                     | 29          | 23.4
| Bachelor’s        | 23                | 30                     | 53          | 42.7
| Associate’s       | 6                 | 0                      | 6           | 4.8
| Some College      | 4                 | 13                     | 17          | 13.7
| H.S. Diploma      | 5                 | 3                      | 8           | 6.5

Note. The number in parentheses is the number of participants. Since one participant did not complete this data, the total N for Ethnicity is 123 (52 in the Intervention; 71 in the Wait List Control).
Table 2

**Weight Categories of Intervention and Wait-list Control Groups at Pre-Ten Weeks (N = 124)**

<table>
<thead>
<tr>
<th>Weight Category</th>
<th>Intervention (53)</th>
<th>Wait-list (68)</th>
<th>Total (120)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Grossly Obese</td>
<td>4</td>
<td>7.5</td>
<td>8</td>
</tr>
<tr>
<td>Moderately Obese</td>
<td>30</td>
<td>56.6</td>
<td>18</td>
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<tr>
<td>Overweight</td>
<td>10</td>
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<td>22</td>
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<td>Normal</td>
<td>8</td>
<td>15.1</td>
<td>17</td>
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<tr>
<td>Low Weight</td>
<td>1</td>
<td>1.9</td>
<td>2</td>
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</tbody>
</table>

Note. The numbers in parentheses are the number of participants who reported their weight-related information. Since four participants did not complete this data, the total N is 120 (53 in the Intervention, 68 in the Wait-list control group). Weight category determined by calculated Body Mass Index (BMI). BMI is calculated as weight in kilograms divided by meters squared. A BMI of greater than 40.1 = Grossly Obese, 30.1 - 40 = Moderately Obese, 25.1 – 30 = Overweight, 20.1 – 25 = Normal, 18.1 – 20 = Low Weight.
### Table 3

**Eating and Dieting Behaviors of Intervention and Wait-list Control Groups at Pre-Ten Weeks (N = 124)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (53)</th>
<th>Wait-list (71)</th>
<th>Total (124)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Eating Behaviors</strong></td>
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<tr>
<td>Eating Disorder</td>
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<td>32.1</td>
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<td>Symptomatic</td>
<td>18</td>
<td>34.0</td>
<td>33</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>18</td>
<td>34.0</td>
<td>23</td>
</tr>
<tr>
<td><strong>Dieting Behaviors</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TOPS</td>
<td>4</td>
<td>7.5</td>
<td>6</td>
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<tr>
<td>Weight Watchers</td>
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<td>Other Business</td>
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<td>15</td>
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<tr>
<td>Shots/Pills</td>
<td>11</td>
<td>20.8</td>
<td>22</td>
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<td>MD Supervised</td>
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<td>7.5</td>
<td>9</td>
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<tr>
<td>Unsupervised</td>
<td>22</td>
<td>41.5</td>
<td>50</td>
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<tr>
<td>Not Eating</td>
<td>10</td>
<td>18.9</td>
<td>18</td>
</tr>
<tr>
<td>Psychotherapy</td>
<td>2</td>
<td>3.8</td>
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</tr>
<tr>
<td>Hypnosis</td>
<td>6</td>
<td>11.3</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>17.0</td>
<td>17</td>
</tr>
<tr>
<td><strong>% Lifetime dieting</strong></td>
<td>36.6</td>
<td>41.3</td>
<td>39.3</td>
</tr>
</tbody>
</table>

Note: The number in parentheses is the number of participants. Eating behavior information obtained from the Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz et al., 1997); those classified as Eating Disordered were those who met the criteria for Eating Disorder Not Otherwise Specified (EDNOS). Dieting information obtained from the Demographic/Supplemental Questionnaire. % Lifetime dieting = participants’ estimation of the percentage of their lives on a diet.
Table 4

Means of Outcome Variables at Post-Ten Weeks for Intervention Group versus Wait-list Control Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention Group</th>
<th>Wait-list Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>BAS</td>
<td>3.53*</td>
<td>3.01</td>
</tr>
<tr>
<td>IES</td>
<td>3.39*</td>
<td>2.72</td>
</tr>
<tr>
<td>FFMQ</td>
<td>136.31*</td>
<td>123.41</td>
</tr>
</tbody>
</table>

Note: BAS, Body Appreciation Scale score; IES, Intuitive Eating Scale score; FFMQ, Five Facet Mindfulness Questionnaire score. Numbers presented are Estimated Marginal Mean scores. IES and BAS scores range from one to five, higher scores represent higher levels of body appreciation and intuitive eating. FFMQ scores range from 39 – 195, higher scores represent higher levels of mindfulness. * = statistically significant difference, $p < .01$. Effect sizes: Partial eta squared = .25 (BAS); .36 (IES); .20 (FFMQ).
Table 5

Means of Intuitive Eating Scale subscales at Post-Ten Weeks for Intervention Groups versus Wait-list Control Group

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Intervention Group</th>
<th>Wait-list Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Permission</td>
<td>3.50*</td>
<td>2.71</td>
</tr>
<tr>
<td>Physical</td>
<td>2.89*</td>
<td>2.25</td>
</tr>
<tr>
<td>Reliance</td>
<td>3.72*</td>
<td>3.21</td>
</tr>
</tbody>
</table>

Note. Permission, Unconditional Permission to Eat subscale; Physical, Eating for Physical Reasons subscale; Reliance, Reliance on Hunger/Satiety Cues subscale. Numbers presented are Estimated Marginal Mean scores. Scores range from one to five, higher scores represent higher levels of permission, eating for physical reasons, and reliance on internal cues. * = statistically significant difference, \( p < .01 \). Effect sizes: Partial eta squared = .37 (Permission); .22 (Physical Eating), .19 (Reliance).
Table 6

*Means of Five Facet Mindfulness Questionnaire subscales at Post-Ten Weeks for Intervention Groups versus Wait-list Control Group*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Intervention Group M</th>
<th>Wait-list Control Group M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observing</td>
<td>29.18*</td>
<td>26.23</td>
</tr>
<tr>
<td>Describing</td>
<td>27.93</td>
<td>26.74</td>
</tr>
<tr>
<td>Awareness</td>
<td>26.65*</td>
<td>23.22</td>
</tr>
<tr>
<td>Nonjudging</td>
<td>29.80*</td>
<td>26.56</td>
</tr>
<tr>
<td>Nonreactivity</td>
<td>22.50*</td>
<td>20.84</td>
</tr>
</tbody>
</table>

*Note. Numbers presented are Estimated Marginal Mean scores. Facet scores range from 8 – 40, with the exception of Nonreactivity, which ranges from 7 – 35. Higher scores represent higher levels of reported ability to observe and describe, as well as bring awareness, nonjudgment, and nonreactivity to experience. * = statistically significant difference, $p < .01$. Effect sizes: Partial eta squared = .18 (Observe); .03 (Describe); .16 (Awareness); .10 (Nonjudgment); .06 (Nonreactivity).*
Table 7

Chi-Square Distribution of Asymptomatic, Symptomatic, and Eating Disordered Participants in Intervention Group versus Wait-List Control Group at Post-Ten Weeks (N = 124)

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group (53)</th>
<th>Wait-List Control Group (71)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Eating Disordered</td>
<td>6</td>
<td>11.32</td>
</tr>
<tr>
<td>Symptomatic</td>
<td>8</td>
<td>15.09</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>39</td>
<td>73.58</td>
</tr>
</tbody>
</table>

Note. The number in parentheses is the number of participants. $\chi^2 (2, n = 124) = 7.13, p < .05.$
VITA

Hannah E. Bush was born August 29, 1983 in Clarksville, TN. She graduated from the University of Minnesota – Twin Cities in 2005 with a Bachelor’s Degree in Psychology and a Minor in Family Social Science. She earned a Master’s degree in Counseling Psychology from the University of Missouri-Columbia in 2008. She will complete her predoctoral internship at the University of Illinois at Chicago Counseling Center in 2011-2012, and plans to pursue a career in clinical practice.