

Promoting healthy eating among college women:  
Effectiveness of an intuitive eating intervention

by

Shannon K. Young

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Major: Psychology (Counseling Psychology)

Program of Study Committee:

Meifen Wei, Major Professor

Douglas Bonett

Wendy Harrod

Lisa Larson

Norman Scott

Iowa State University

Ames, Iowa

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## CHAPTER ONE: INTRODUCTION

Psychological research of eating disorder prevention efforts is in the beginning stages of examining how the promotion of adaptive eating can reduce future risk of disordered eating. Historically, eating disorder prevention programs have emphasized primarily the modification of existing risk factors such as thin-ideal internalization (Stice, Shaw, Burton, & Wade, 2006; Stice, Presnell, Gau, & Shaw, 2007) and body dissatisfaction (Bearman, Stice, & Chase, 2003) to prevent the development of eating pathology. Although risk factor reduction is an important component in preventative efforts, it is equally critical to better understand how adaptive attitudes and behaviors (e.g., intuitive eating) can promote healthy eating and prevent the future development of disordered eating. Attending to this gap in the literature, the main goals of the current study were to examine the effectiveness of an intuitive eating intervention and explore who would benefit most from this brief preventative intervention.

### *Intuitive Eating*

A forerunner in the empirical study of healthy eating and psychological wellness, Tylka (2006) operationalized Tribole and Resch's (1995) concept of intuitive eating. There are three interrelated features to intuitive eating: (a) granting oneself unconditional permission to eat desired foods when hungry, (b) eating based on physiological hunger as opposed to emotional eating, and (c) reliance on hunger and satiety cues to decide when and how much to eat (Tribole & Resch, 2003). Unconditional permission to eat includes an attunement to hunger signals and food preferences and also the absence of making food choices based on whether or not the food falls into a good or bad (i.e., high fat content) category. In opposition to the concept of intuitive eating, many people maintain an eating



lifestyle dictated by food rules (e.g., eating low calorie food). In doing so, negative consequences to such rule-governed and/or restrictive eating result. For instance, studies have found that restriction of caloric intake resulted in binge-eating among individuals with bulimia nervosa (Telch & Agras, 1996).

The second core feature of intuitive eating, an emphasis on biologically driven versus emotionally driven eating, has been supported as a key element of healthy eating. Specifically, Costanzo, Reichmann, Friedman, and Musante (2001) and Herman, Polivy, Lank, and Heatherton (1987) found that, when restrictive dieting replaces innately guided hunger and satiety cues, the frequency of overeating while emotionally distressed increases. Moreover, increases in dieting predicted increases in negative affect (Stice & Bearman, 2001), bulimic symptoms (Stice & Agras, 1998), and eating pathology (Leon, Fulkerson, Perry, Keel, & Klump, 1999).

The third defining feature of intuitive eating (i.e., reliance on hunger and satiety cues) includes the awareness of hunger and satiety body signals and trusting these sensations to guide healthy eating (Tribole & Resch, 2003). Supporting the presence of innate cues that regulate eating, it was found that when young children are permitted to autonomously determine the amount of food they consume, their total daily caloric intake is consistently nutritionally balanced despite variable amounts and kinds of food eaten at each meal (Birch, Johnson, Andresen, Peterson, & Schulte, 1991).

With the recent introduction of the Intuitive Eating scale (IES; Tylka, 2006), based on the work of Tribole and Resch (1995), empirical investigation of intuitive eating is in its infancy. Thus far only three studies have explored correlates or predictors of intuitive eating (Avalos & Tylka, 2006; Tylka, 2006; Tylka & Wilcox, 2006). In these studies, components

of intuitive eating were found to be significantly and negatively correlated with disordered eating symptoms. Among the three intuitive eating concepts described above, reliance on hunger and satiety cues and eating for physiological rather than emotional reasons were inversely related to disordered eating symptoms. These findings have important implications for the development of disordered eating prevention programs. Specifically, the presence of intuitive eating features that are distinct from eating disorder symptoms suggests that prevention programs should extend beyond a focus on symptom reduction. In conjunction with reducing eating pathology, prevention programs should also emphasize increasing adaptive eating practices to reduce the future risk of disordered eating. Helping individuals learn how to discriminate between hunger signals and emotional needs would serve to promote healthier eating and reduce the likelihood of future bulimic symptoms (Tylka & Wilcox, 2006). Consistent with this proposition, the current study's prevention program included interventions designed to increase participants' unconditional permission to eat, ability to identify hunger and satiety cues, and ability to differentiate hunger and emotional needs to promote healthy eating. In sum, the current study examined the effectiveness of an intuitive eating intervention to increase intuitive eating practices, enhance body image effects, decrease adherence to dieting standards, and reduce disordered eating symptoms attitudes.

#### *Disordered Eating Prevention Programs: Theories and Empirical Studies*

Based on a review of the literature, the dual pathway theory of disordered eating risk (Stice, Ziemba, Margolis, & Flick, 1996) has received the most empirical testing and is supported in several studies (Stice, 2002; Stice & Agras, 1998; Stice, Killen, Hayward, & Taylor, 1998; Stice, Presnell, & Spangler, 2002). Essentially, the dual pathway model

purports that the risk for disordered eating (e.g., binge-eating) increases as a function of the interactions between thin-ideal internalization, body dissatisfaction, dieting, and negative affect. More specifically, this risk model asserts that internalizing a thin-ideal body type gives rise to body dissatisfaction, which in turn elicits dieting and negative affect. Dieting and negative affect then increase the risk for disordered eating behaviors.

Most eating disorder prevention programs are linked to the dual pathway model in that they have targeted the reduction of body dissatisfaction and dietary restraint (e.g., Bearman, Stice, & Chase, 2003; Celio et al., 2000; Franko et al., 2005; Johnson & Wardle, 2005; Mann et al., 1997; Zabinski, Wilfley, Calfas, Winzelberg, & Taylor, 2004) and thin-ideal internalization (e.g., Becker, Smith, & Ciao, 2006; Celio et al.; Franko et al.; Stice et al., 2006). Conceptually compatible with intuitive eating, the dual pathway model of disordered eating risk informed the current study's design such as the selection of body image effects and dieting as outcome variables of interest.

Recent eating disorder prevention programs have demonstrated significant intervention effects in the reduction of disordered eating risk factors among adolescent and college-age females (e.g., Franko et al., 2005; Stice et al., 2006; Zabinski et al., 2004). Specifically, among a sample of female adolescents, Stice et al. (2007) reported significant decreases in body dissatisfaction, dieting, and bulimic symptoms following participation in a dissonance-based intervention. Stice et al. (2007) also found significant reductions in body dissatisfaction and increases in healthy eating behaviors following participation in a three-session healthy eating program.

In a recent meta-analysis, Stice and Shaw (2004) provided several helpful suggestions for the development of future disordered eating prevention or healthy eating programs. First,

they recommended that the title of the prevention program (e.g., eating disorder prevention program versus body acceptance program) might moderate intervention effects. Specifically, the manner in which prevention programs are described to participants may moderate the results by virtue of how the title affects the participants' anticipated outcomes. Supporting this proposition, the majority of programs producing significant reductions in eating pathology were not described as eating disorder prevention programs. Instead, they were advertised with less stigma-laden language and less overt intentions to change behavior (e.g., body acceptance program; Stice & Shaw).

Additionally, Stice and Shaw (2004) asserted that there is no empirical evidence to support that merely providing psychoeducation about the nature and effects of disordered eating reduces the risk of future disordered eating. Accordingly, prevention programs using this approach have not produced significant effects. Their meta-analysis concluded that programs with interactive components tended to demonstrate significant intervention effects, whereas purely didactic, psychoeducational programs failed to reduce eating disorder symptoms. Also supporting the effectiveness of interactive components, Fennell and Teasdale (1987) concluded that interventions integrating homework assignments may foster self-efficacy by increasing perceived control over a behavior that has been previously experienced as uncontrollable.

#### *Current Study: The Intuitive Eating Intervention*

The format of this study's intuitive eating intervention was adapted from the original work of Tribole and Resch (1995, 2003) and also informed by the dual pathway model of disordered eating risk. In addition, the design of the intuitive eating intervention was informed by the suggestions outlined by Stice and Shaw's (2004) meta-analysis and the

previous outcome research mentioned above. The intuitive eating intervention consisted of three 50-minute workshop-format presentations based on the 10 principles of the intuitive eating model (Tribole & Resch, 2003). Tribole and Resch (1995, 2003) suggested that the process of becoming an intuitive eater develops over five stages. Given the brevity of the current study's proposed intervention, it was anticipated that intervention participants would achieve the stage of conscious exploration of intuitive eating attitudes and practices. Within this stage, individuals are motivated to apply intuitive eating concepts in their lives, but behaviors are not yet automatic and thus require a conscious commitment to implement. To assess the effects of the program, participants were asked to complete outcome questionnaires at four time points: pretest, posttest, and two follow-up sessions. In addition, to control for potential confounding variables (e.g., testing effects) the current study used random selection of participants to either a control or intervention group.

Undergraduate women assigned to the intuitive eating intervention group were introduced to the core principles of intuitive eating and provided guidance for implementing these principles into their lives. The main goal of the first intuitive eating session was to inspire participants to challenge and critically examine the culture of dieting by raising awareness of dieting myths and exploring the negative biological and psychological consequences of restrictive eating practices. The possibility of creating a healthy relationship between food, mind, and body by adopting an intuitive eating mindset and lifestyle was also introduced. More specifically, this segment provided participants with a road map for what they could anticipate as they implemented the intuitive eating concepts (e.g., internalizing an unconditional permission to eat preferred foods and learning to trust the body's hunger/fullness signals). In addition, the first session included a demonstration of how to

complete the Hunger Discovery scale (Tribole & Resch, 2003), followed by prompts for participants to practice this exercise during the workshop and at home.

The goals of the second workshop were four-fold: (a) to reinforce the concepts introduced in the first session (i.e., honoring your hunger and unconditional permission to eat), (b) to encourage participants to challenge distorted thinking regarding food and replace distorted thinking with positive messages about food (e.g., “I have the right to eat what I like.”), (c) to familiarize participants with the notion of becoming attuned to feelings of fullness as a means to inform decisions about the quantity of food intake, and (d) to raise awareness of distinguishing between eating for emotional versus biological reasons and to encourage consideration of alternative coping skills. At the close of the second workshop, participants were asked to respond to questions about what they had learned in the first two workshops.

Lastly, the third session’s objectives included: (a) reinforcing concepts introduced in the second session (e.g., feeling your fullness and alternative means of meeting emotional needs), (b) honoring body diversity and challenging cultural pressure for thinness, (c) exploring ways to increase physical activity as a means to take care of the mind and body, and (d) imparting information about normal eating and how to compassionately and realistically assess success with the process of becoming an intuitive eater. At the close of this final session, participants were asked to respond to questions about what they had learned and would like to continue applying in their daily lives.

Consistent with intuitive eating and the dual pathway model of disordered eating risk, the intuitive eating intervention comprised content specifically designed to increase intuitive eating practices, increase the positive effects of body image, and reduce dieting and

disordered eating attitudes in order to reduce present and future risk of disordered eating. Based on these objectives, it was hypothesized that, compared to the control group, the members of which were not exposed to the intervention, the intervention group would demonstrate significantly greater improvements in the outcome variables at the posttest and two follow-up assessments.

#### *Emotional Awareness and Eating Self-Efficacy as Moderators*

It was anticipated that some individuals may benefit from the intuitive eating intervention more than others depending on certain intrapersonal characteristics (e.g., emotional awareness and eating self-efficacy). First, emotional awareness (i.e., the capacity to identify and express emotions) was examined as a moderator of the effects of the intuitive eating intervention program. Considering the effective implementation of intuitive eating practices strongly rests on the ability to access and interpret internal sensations (i.e., biological hunger/fullness and emotional states), it was predicted that women who were less emotionally aware would be at a disadvantage in a brief intervention. At present, no study in the disordered eating literature was found to investigate emotional awareness as a potential moderator of intervention effects. However, a substantial body of research supports significant associations between diminished emotional awareness, measured by the alexithymia construct, and disordered eating (e.g., Bydlowski et al., 2005; Cochrane, Brewerton, Wilson, & Hodges, 1993; Garfinkel et al., 1983; Quinton & Wagner, 2005; Rybicki, Lepkowsky, & Arndt, 1989).

Alexithymia is a widely researched construct that is operationally defined as a diminished capacity to identify and verbalize emotions. Among published studies, alexithymia as a moderator of treatment effects has been examined only once. Rosenblum et

al. (2005) found alexithymia to significantly moderate the effects of a cognitive–behavioral versus motivational intervention for substance abuse. More specifically, participants with lower alexithymia (i.e., higher emotional awareness) compared to those with higher alexithymia (i.e., lower emotional awareness) benefited more from the motivational intervention focusing on emotional awareness as opposed to the cognitive–behavioral intervention focusing on skill building. Given that the current study’s intuitive eating intervention strongly emphasized enhancing awareness of internal sensations and emotions, it was anticipated that individuals with higher emotional awareness compared to those with lower emotional awareness would demonstrate greater increases in intuitive eating practices and positive body image effects as well as reductions in dieting and disordered eating symptoms.

According to self-efficacy theory (Bandura, 1977), self-efficacy plays a significant role in determining an individual’s response to new challenges. Individuals with lower self-efficacy are more apt to underestimate their ability to successfully perform unfamiliar tasks (e.g., initiating new eating practices), whereas those with higher self-efficacy tend to feel more confident in their ability to learn and master new skills (Bandura & Cervone, 1986). Bandura (1997) extended his original theory arguing that perceptions of self-efficacy are domain specific. Based on the tenets of self-efficacy theory, it was anticipated that women who have higher eating self-efficacy would feel more capable of implementing intuitive eating practices and, as a result, demonstrate greater improvements in the outcome variables. Conversely, intervention participants who have lower eating self-efficacy were deemed likely to doubt their competence from the start, resulting in less determination to employ intuitive



eating practices. As such, eating self-efficacy was identified as a possible moderator of the intervention effects in the current intuitive eating intervention.

A review of extant literature supports the link between self-efficacy and the ability to engage in new, healthy behaviors (e.g., regular physical activity and balanced nutrition plans) (Linde, Rothman, Baldwin, & Jeffery, 2006; Long & Stevens, 2004). Given that self-efficacy is related to the commitment to begin and sustain new behaviors, it is surprising that only one empirical study within relevant literature examined eating self-efficacy as a moderator of intervention effects. Specifically, Saksvig et al. (2005) found dietary self-efficacy moderated dietary knowledge and the advent of healthy eating behaviors among a sample of children participating in a healthy eating and exercise program. This study's objectives parallel the intended effects of the current study's intervention in that it was predicted that the acquisition of information about healthy eating practices (e.g., attending to hunger and satiety cues to guide food intake) would result in changes in eating attitudes and behaviors. Supported by Saksvig et al.'s findings, the present study examined eating self-efficacy as the second moderator on the effect of the intuitive eating intervention program. It was predicted that women with higher eating self-efficacy, relative to those with lower eating self-efficacy, would demonstrate significantly greater improvements in the outcome variables (i.e., increases in intuitive eating and positive effects of body image and reduction of dieting and disordered eating symptoms).

### *Hypotheses*

In summary, there were three sets of hypotheses in this study. First, it was predicted that participants assigned to the intuitive eating intervention group would demonstrate greater improvements of outcomes (i.e., greater increases in intuitive eating and positive effects of

body image and decreases in dieting and disordered eating symptoms) at posttest and the two subsequent follow-up assessments compared to the control group participants.

Second, it was hypothesized that emotional awareness would moderate the effects of the intuitive eating intervention on intuitive eating practices, body image effects, dieting, and disordered eating symptoms at posttest and the two follow-up assessments. Specifically, it was anticipated that participants with higher emotional awareness would demonstrate greater improvements (i.e., greater increases in intuitive eating practices and positive effects of body image and decreases in dieting and disordered eating symptoms) compared to participants with lower emotional awareness.

Finally, it was predicted that, after controlling for general self-efficacy, eating self-efficacy would moderate the effects of the intuitive eating intervention on intuitive eating practices, body image effects, dieting, and disordered eating symptoms at posttest and the two follow-up assessments. That is, relative to those with lower eating self-efficacy, those with higher eating self-efficacy would report significantly greater improvements (i.e., greater increases in intuitive eating and positive body image effects and decreases in dieting and disordered eating symptoms).

## CHAPTER TWO: LITERATURE REVIEW

The present literature review will first explore the background, concepts, and theoretical foundations of the intuitive eating model. Next, the dual process model of disordered eating risk and empirical findings as they relate to intuitive eating will be summarized followed by a description of the present study's intuitive eating intervention. After this section, a review of the literature regarding the constructs of emotional awareness and eating self-efficacy as they relate to the current study's moderation hypotheses will be presented. Next, descriptions and rationales for the instrument chosen to assess for eating disorder diagnoses and to measure the outcome variables (i.e., intuitive eating, body image effects, dieting, and disordered eating symptoms), the covariate (i.e., general self-efficacy) and the moderators (i.e., emotional awareness and eating self-efficacy) will be addressed. The chapter will conclude with a summary of this study's main hypotheses.

### *Intuitive Eating Model*

Psychological research has focused primarily on targeting the reduction disordered eating risk factors to prevent the future development of eating disorders, neglecting the study of adaptive eating practices that could provide a safeguard against this risk to psychological well-being. Conversely, in other fields such as dietetics there has been a stronger emphasis placed on defining healthy eating from the standpoint of adaptive attitudes and behaviors. Pioneers in the area of healthy eating, Tribole and Resch (1995, 2003) developed the intuitive eating model that has since become a widely recognized and respected healthy eating and body acceptance paradigm.

As seasoned nutritionists well-versed in working with clients to establish healthy eating guidelines, Tribole and Resch (2003) recognized that many clients were not able to

sustain the dietary plans they had created. Although these eating plans allowed for substantial freedom of choice in terms of food selection, they began to question whether their recommended plans were fundamentally similar in nature to other diets they eschewed for setting people up for failure, guilt, and disempowerment. Not willing to wholeheartedly endorse the growing anti-diet movement at the time, these authors recognized the need to integrate their knowledge of nutrition and health research with philosophical elements from the anti-diet movement. Thus was born the concept of intuitive eating.

At the heart of the intuitive eating model is the notion that we are all born with the innate ability to physically sense what our body needs for optimal nourishment and maintenance of a healthy body size and shape. Trusting biological hunger and satiety cues to guide food intake is suggested to promote a healthy body size and shape for any body type (Tribble & Resch, 1995). However, chronic obsessive dieting in the pursuit of a thin-ideal body size suppresses this innate sense. Empirical evidence supports this central tenet of the intuitive eating model. Specifically, in an experimental study with young children, when they were free to choose the quantity of food consumed at each meal, they exhibited highly variable per-meal food intake. However, their total daily caloric energy intake remained fairly constant, supporting the existence of an internal mechanism that naturally regulates food consumption to maintain favorable health (Birch et al., 1991).

Further supporting the link between the body's intrinsic ability to guide healthy eating, Avalos and Tylka (2006) reported that college-age women ( $N = 181$ ) who were more focused on how their body feels internally as opposed to their outward physical appearance were more likely to demonstrate intuitive eating behaviors ( $r = .50, p < .001$ ). Interpreting these findings, it could be that women who have an inward mind-body attunement are more

inclined to follow biological hunger and satiety cues compared to women who look to external sources (e.g., peers and culturally defined ideals) to guide their eating-related decisions.

Another key feature of the intuitive eating model is that of developing a mindset of eating foods unconditionally and thus free of guilt. Central to this feature is the rejection of formulaic dieting guidelines that restrict food selection to certain kinds of foods and abstinence from others. Tribole and Resch (2003) pointed out that dieting and categorizing foods as either good or bad engenders guilt when these guidelines are not followed, increasing the risk of emotion-based eating and food obsessions. Research findings support this proposition. For example, in an experimental study with men who had not previously exhibited food preoccupations, they became exceedingly obsessed with food after subjected to a very restricted diet for a 6-month period (Keys, Brozek, Henschel, Mickelsen, & Taylor, 1950). Moreover, many of the men had binge-eating episodes well after the conclusion of the experimental diet. Given the bulimic symptoms (i.e., binge-eating) observed in these men, it is not surprising that Tylka (2006) found a strong inverse relation between the unconditional permission to eat aspect of intuitive eating and disordered eating symptoms (i.e., dieting;  $r = -.73$ ) measured by the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979).

Similarly, individuals who abstain from dieting compared to those who regularly diet have been found to be less preoccupied with food and less apt to engage in emotional eating (Carper, Fisher, & Birch, 2000; Fedoroff, Polivy, & Herman, 1997; Kahan, Polivy, & Herman, 2003). Empirical evidence also suggests that individuals who episodically diet gain more weight over time compared to individuals who do not engage in dieting (Klesges, Isbell, & Klesges, 1992; Stice, Cameron, Killen, Hayward, & Taylor, 1999). Research

suggests that 95% of individuals who diet and lose weight eventually regain the weight that was previously lost. Furthermore, it was reported that several of the individuals who dieted actually gained more weight than was initially lost, suggesting that dieting is not a sustainable answer to weight management (Heatherton, Mahamedi, Striepe, Field, & Keel, 1997). Further supporting intuitive eating as a healthier viable alternative, Polivy and Herman (1999) found that individuals who restrict their diet actually eat more than individuals who allow themselves unconditional permission to eat their preferred foods.

Eating for physical hunger as opposed to emotional needs is another core component of the intuitive eating model and one that has also been supported as an important aspect of adaptive eating. For instance, studies have shown that people who do not restrict their diets are less likely to eat when they are distressed. It is suggested that this natural absence of emotion-triggered eating in nondieting individuals can be explained by the natural sympathetic suppressive effects of certain emotions (e.g., anxiety; Herman et al., 1987). However, when eating is not guided naturally and is instead governed by external sources, food intake often becomes disinhibited given that internal hunger and satiety cues have been habitually suppressed. As a result, the likelihood of emotion-based eating is increased (Costanzo et al., 2001; Herman et al.).

According to Tribole and Resch (2003), the process of becoming an intuitive eater is a five-stage process. The length of this process varies across individuals, depending on such factors as dieting and emotion-based eating history and strength of dieting beliefs. The goal of the first stage is a dedicated acceptance that dieting is detrimental to psychological and physical health and is an ineffective strategy to modify body size and shape. Conscious exploration of applying intuitive eating in daily life defines the second stage (e.g., learning to

distinguish between emotional states and biological hunger). At stage three, less effort is required to practice intuitive eating as attitudes and behaviors become more automatic. The belief that the body can be trusted to guide eating and the ability to sense preferred foods are more firmly established within this stage. At stage four, it has become habitual to cease eating when full and food selection becomes healthier, not for the purposes of weight loss but for physical well-being and taste preferences. Also at this stage, self-talk around food is more positive and the body will be nearing a healthy body size and shape. Lastly, at stage five food selection is free of guilt-ridden beliefs.

Given the empirical support for the intuitive eating model as an adaptive eating paradigm, this model was chosen to inform the contents of this study's intuitive eating intervention.

### *Disordered Eating Prevention Programs*

#### *Dual-Pathway Model*

Several theoretical conceptualizations of how risk factors contribute to the development and maintenance of eating disturbances have been examined in the literature. However, one model in particular stands out as the most widely supported and empirically tested: the dual-pathway model of disordered eating risk. This theory asserts that sociocultural pressure to achieve a thin-ideal body shape results in the internalization of an unrealistic, ideal body type, which in turn fosters body dissatisfaction. Body dissatisfaction may then precipitate dieting and negative affect, a combination that then contributes to the development of bulimic symptoms (e.g., binge-eating). Presumably, body dissatisfaction influences dieting behaviors because dieting is seen as a viable option for weight control and it also fosters negative affect by promoting evaluation of self-worth based on physical

appearance. Furthermore, it is claimed that dieting increases the risk of bulimic symptoms in one of two ways. Namely, depletion of essential caloric energy after dietary restriction or the emotional effects of violating dietary rules may both influence episodes of binge-eating (Stice, Ziemba, et al., 1996).

Providing support for the dual-pathway model, in three separate studies perceived pressure to be thin, thin-ideal internalization, body dissatisfaction, dieting, and negative affect predicted the onset of bulimic symptoms (Stice & Agras, 1998; Stice et al., 1998; Stice et al., 2002). Moreover, in a prospective study of the dual-pathway theory in a mediational model, Stice (2001) found consistent supporting evidence for this model. As hypothesized, pressure to be thin ( $r = .14, p = .043$ ) and thin-ideal internalization ( $r = .25, p = .001$ ) predicted greater body dissatisfaction. Body dissatisfaction predicted elevations in dieting ( $r = .35, p = .001$ ) and negative affect ( $r = .21, p = .001$ ). Dieting ( $r = .36, p = .001$ ) and negative affect ( $r = .18, p = .006$ ) predicted greater symptoms of bulimia. Overall, this model explained 23% of the variance in the escalation of bulimic symptoms.

Although support for dieting as a risk factor appears quite strong in the results outlined above, other researchers have noted the influence of dieting on eating pathology is variable. Some studies have found that only about 50% of all individuals who engage in binge-eating do so after intervals of significant dieting (Brewerton, Dansky, Kilpatrick, & O'Neil, 2000; Johnson & Wardle, 2005). Consistent with these findings, Johnson and Wardle found no support for the direct link between dietary restraint and disordered eating symptoms. However, the combined effect of body dissatisfaction and restrictive dieting appeared to be a primary predictor of bulimic symptoms.



### *Empirical Findings of Prevention Programs*

In light of the strong empirical support for the dual-pathway model, the majority of disordered eating preventative interventions have targeted the reduction of dieting and body dissatisfaction as well as general eating disorder symptoms. Reviewing 38 eating disorder prevention programs, Stice and Shaw (2004) reported 25% of the programs reduced current disordered eating symptoms and future risk for eating pathology. Moreover, 61% of the interventions resulted in significant decreases in at least one disordered eating risk factor (e.g., body dissatisfaction). In addition, several potential moderators of intervention effects were noted in this meta-analytic review. Specifically, Stice and Shaw reported notable trends in the effective prevention programs in that they targeted older adolescents or young women, were interactive as opposed to purely psychoeducational, and were not advertised as eating disorder interventions. It was suggested by the authors that this latter finding may be linked to increased participant defensiveness as an artifact of knowing that the interventions are specifically designed to change disordered eating behaviors. Prevention programming advertisements with less explicitly stated goals of behavioral change were recommended to reduce the likelihood of participant reactance in future studies.

Several of the programs examined in Stice and Shaw's (2004) meta-analysis had important implications for the current study's intuitive eating intervention. For instance, Smolak and Levine (2001) reported, at a 2-year follow up, adolescent females who had participated in a 10-session prevention program based on the social cognitive model continued to have higher body esteem compared to controls. This program included formal psychoeducational presentations and homework assignments emphasizing healthy eating, acceptance of body size diversity, and critical analysis of dieting myths. Based on the success

of this program, which was conceptually similar to the intuitive eating model, the present study's intuitive eating intervention also included interactive elements (i.e., intuitive eating homework assignments and brief discussions of homework results).

Brief disordered eating prevention efforts, similar to this study's intervention, have demonstrated success with producing comparable changes in targeted outcome variables. For instance, among a sample of female undergraduates ( $N = 30$ ), participants in a dissonance-based intervention group showed significant reductions in disordered eating risk factors. This interactive dissonance program consisted of three weekly 1-hour group sessions designed to modify the thin-ideal internalization, a variable closely linked to body dissatisfaction ( $r = .71$ ; Wiederman & Pryor, 2000). The primary mechanism of change in this intervention was the induction of cognitive dissonance among women who had internalized the thin-ideal. More specifically, these women were invited to take a counterattitudinal position against thin-ideal standards, which theoretically induced a state of cognitive dissonance and subsequent psychological adjustments to abate the dissonance. As predicted, participants in the experimental group demonstrated significant reductions in thin-ideal internalizations compared to the control group (Stice, Mazotti, Weibel, & Agras, 2000). Furthermore, relative to the control group participants, at posttreatment the women in the dissonance program demonstrated significant decreases in body dissatisfaction,  $F(2, 56) = 5.70, p < .01$ , and bulimic symptoms,  $F(2, 56) = 4.08, p < .05$ . At a 1-month follow up, these effects accounted for 17% and 13%, respectively, of the total changes in these variables over time.

Comparing intervention and control groups, these results were later replicated in a sample of adolescent females ( $N = 481$ ; Stice et al., 2006). In this later trial, significant

changes in dieting, body dissatisfaction, and bulimic symptoms were sustained at a 6-month follow up. Also in this study, a three-session healthy weight intervention was administered. Similar to the dissonance-based intervention, the healthy weight program encouraged participants to critically examine the benefits of adopting a healthy ideal as opposed to the thin-ideal. However, the two programs differed in that the healthy weight program content included psychoeducation regarding maintaining a balanced routine of diet and exercise. Compared to the control group, the intervention effects in the healthy eating group paralleled those of the dissonance-based group. In addition, at the 6-month and 1-year follow-up assessments, neither group outperformed the other in terms of producing significantly greater changes in disordered eating risk factors and bulimic symptoms.

### *Current Study*

#### *Intuitive Eating Intervention*

The present study's intuitive eating intervention was based on the intuitive eating model (Tribole & Resch, 1995, 2003) and also informed by the dual-pathway model of disordered eating risk (Stice, Ziemba, et al., 1996). Consistent with these models, the outcome variables included intuitive eating, body image effects, dieting, and disordered eating attitudes. Furthermore, the design of the study integrated the suggestions set forth by Stice and Shaw (2004) that are summarized above.

The sample for this study comprised college women enrolled in introductory psychology courses who voluntarily signed up for an on-line screening for possible participation in an intuitive eating workshop. Screening participants were assessed for whether or not they met the criteria for an eating disorder as determined by a self-report screening instrument. This screening process was based on cautions by Tribole and Resch

(2003) that individuals at certain stages of eating disorder treatment may not be psychologically ready to benefit from the intuitive eating program. After meeting certain inclusion and exclusion criteria, the women were contacted and invited to participate in the second phase of the study in which they were randomly selected for participation in either the intuitive eating intervention or control group. If they met diagnostic criteria for an eating disorder, they were excluded from the study and offered information about university counseling services.

Participants in both groups completed pretest, posttest, and two follow-up assessments within a time frame of 3 weeks. The intuitive eating intervention entailed attending three workshops 50-90 minutes in length and held on separate days. The workshops familiarized participants with the concept and benefits of an intuitive eating lifestyle. The workshop content was directly linked to the 10 principles of the intuitive eating model (Tribole & Resch, 2003). These principles are: (a) rejection of the dieting mentality perpetuated in popular culture, (b) honoring biological hunger, (c) giving oneself unconditional permission to eat preferred foods, (d) challenging and avoiding placing foods in good or bad categories, (e) becoming attuned to and guided by one's body's satiety cues, (f) allowing one's eating to be guided by cravings to make eating a satisfying experience, (g) coping with emotions without using food, (h) respecting one's genetically influenced body type, (i) engaging in regular physical activity to promote physical well-being, and (j) honoring one's body's need for balanced nutrition.

Within this study's intervention, all of these principles were addressed to varying degrees, with the majority of the emphasis placed on the first eight principles due to the intervention's short-term nature. It was anticipated that intervention participants would reach

the conscious exploration stage of applying intuitive eating principles (e.g., tuning into and allowing hunger and satiety cues to guide food type and quantity selection). Participants were encouraged to continue the process of becoming an intuitive eater beyond the conclusion of the study. They were advised that persistent application of the intuitive eating principles would eventually result in the newly learned attitudes and behaviors becoming more of an automatic lifestyle. Taking into account Stice and Shaw's (2004) observation that interactive prevention programs have been more effective, this study's intervention included guided self-reflection questions, in-session practice of the intuitive eating concepts, brief take-home assignments, and brief in-session participant sharing of their reactions to implementing intuitive eating in their daily lives.

Lastly, this study's main hypothesis involved comparing the outcome effects (i.e., intuitive eating, body image effects, dieting, and disordered eating attitudes) between the intervention and control groups. It was hypothesized that the intervention group would demonstrate greater improvements in intuitive eating and body image effects and greater decreases in dieting and disordered eating attitudes compared to the control group at posttest and the two follow-up assessments. These outcome differences were predicted for two main reasons. First, compared to the control group, it was planned that the intervention group be exposed to information that challenges faulty beliefs associated with dieting and raises awareness of how dieting can cause disordered eating symptoms (e.g., binge-eating). As a result, it was anticipated the intervention participants as opposed to the control group would reduce their dieting thoughts and behaviors and disordered eating attitudes. Second, relative to the control group, it was also planned that the intervention group be introduced to the concepts (e.g., honoring your natural body type) and application of intuitive eating (e.g.,

tuning into hunger and satiety cues) and encouraged to apply intuitive eating practices in their daily lives. Consequently, it was predicted the intervention group would demonstrate greater improvements in body image effects and intuitive eating.

### *Moderators of the Intuitive Eating Intervention*

#### *Emotional Awareness*

Several studies have reported individuals with eating disturbances demonstrate a diminished ability to identify and describe their emotional states (e.g., Kiyotaki & Yokoyama, 2006; Bydlowski et al., 2005). Specifically, among a nonclinical sample of female undergraduates in Japan ( $N = 194$ ), lower emotional awareness was significantly correlated with dieting ( $r = .93$ ), bulimia and food preoccupation ( $r = .68$ ), oral control ( $r = .51$ ), and general disordered eating ( $r = .34$ ; Kiyotaki & Yokoyama). Furthermore, also in this study it was shown that the limited capacity to identify and articulate feelings significantly predicted general eating disturbances. Similarly, difficulty identifying and describing emotions predicted symptoms of bulimia in a sample of female undergraduates (Quinton & Wagner, 2005). Based on these findings, there appears to be substantial evidence to support the link between impairments in emotional awareness and disordered eating.

Based on past research, it is possible that women with limited abilities to access and understand their emotions, compared to those without this challenge, may be at a disadvantage within a brief intervention emphasizing awareness of emotions and bodily sensations in order to promote adaptive eating practices. Thus, it was anticipated that the level of emotional awareness would moderate the effects of this study's intuitive eating intervention (i.e., changes in intuitive eating, body image effects, dieting, and disordered eating attitudes). To date, the relations among these specific variables have not been

empirically examined. A review of the literature indicated at the time of this writing that there were only two studies that had explored the construct of emotional awareness as a potential moderator, suggesting a need for more research in this area.

In these moderation studies, the Toronto Alexithymia scale (TAS-20; Bagby, Parker, & Taylor, 1994) was used to assess participants' level of emotional awareness. Among a nonclinical sample of women, van Strien and Ouwens (2006) found alexithymia (i.e., difficulty identifying and expressing feelings) to significantly moderate psychological distress and emotional overeating in an experimental study ( $N = 86$ ). This result supports Bruch's (1973) contention that individuals with eating disturbances may have an impaired ability to distinguish between hunger sensations and emotional discomfort (i.e., poor interoceptive awareness) from other sources of distress. Consequently, these individuals may engage in a pattern of emotional overeating in response to internally undifferentiated physiological arousal.

Taking into account that approximately 60% of college age women diet on a regular basis (Killen et al., 1993), it was expected that some women in the current study would demonstrate elevated eating and weight concerns. Based on van Strien and Ouwens' (2006) findings, women with elevated eating and weight concerns may also have lower levels of emotional awareness compared to other participants. As such, it was anticipated that some participants in the present study would be less able to differentiate between biological hunger and their emotional needs. Due to the possible varying degrees of emotional awareness among participants, it was reasonable to assume that some women would be more readily able to apply intuitive eating practices compared to others who may struggle with identifying their internal sensations.

Supporting this potential moderating effect, Rosenblum et al. (2005) found alexithymia to significantly moderate the effects of an outpatient cognitive-behavioral group intervention for substance abuse ( $N = 230$ ). More specifically, participants who demonstrated higher levels of alexithymia benefited more from the cognitive-behavioral group than the motivational interviewing group intervention in that they sustained a longer period of abstinence. Conversely, individuals who had lower levels of alexithymia benefited more from the motivational interviewing group. Key differences between these group interventions had important implications for the development of the current study. Most importantly, the cognitive-behavioral intervention was focused mainly on skill-building whereas the motivational interviewing group strongly emphasized the awareness and articulation of emotions. Given that this study's intuitive eating intervention was planned to strongly emphasize awareness of emotional and bodily states (i.e., hunger and satiety), it was expected that individuals with higher levels of emotional awareness compared to those with lower levels (i.e., alexithymic) would benefit more from the program content.

### *Eating Self-Efficacy*

Self-efficacy plays an essential role in promoting behavior change. According to self-efficacy theory, in order for change to occur certain conditions must be present. Individuals must believe that change will bring about the desired outcomes (i.e., outcome expectancies) and also believe that they are capable of making changes (i.e., efficacy expectancies; Bandura, 1977). Furthermore, Bandura (1997) asserted that self-efficacy should be viewed as task-specific, a proposition supported in subsequent studies. For example, Pajares and Miller (1995) found that outcome expectancy with regard to success in math courses was a stronger predictor of students' selection of math majors compared to their confidence in mathematical



problem-solving. Applying the self-efficacy model to eating behavior change, several cross-sectional studies have supported eating self-efficacy as a significant predictor of eating behaviors during and after participation in weight loss programs (e.g., Clark, Abrams, Niaura, Eaton, & Rossi, 1991; Glynn & Ruderman, 1986; Linde et al., 2006; and Shannon, Bagby, Wang, & Trenkner, 1990).

Self-efficacy theory of behavior change and associated empirical evidence had important implications for the development of this study's intuitive eating intervention. Specifically, it was expected that individuals who participated in the current study's intervention would enter the program with varying degrees of eating self-efficacy to change their behavior in regards to eating patterns (e.g., not eating when anxious). As a result of these lowered self-efficacy expectations it was anticipated these participants would be less invested and motivated to actively participate in the program and transfer intuitive eating attitudes and behaviors into their daily lives. Consistent with this hypothesis, among a sample of 349 (87% adult women), eating self-efficacy measured at pretreatment predicted engagement in monitoring behaviors (e.g., tracking eating patterns) during an 8-week weight loss program ( $r_s = .24$  to  $.52$ ,  $p < .01$ ; Linde et al., 2006).

Similarly, it was predicted that lower eating self-efficacy may preclude potential program benefits for such participants who would likely anticipate failure, which may discourage them from implementing intuitive eating practices (e.g., hunger and fullness monitoring). As a result, these participants would be less likely to demonstrate improvements in the outcome variables (e.g., intuitive eating and body image effects) compared to participants with higher eating self-efficacy. Considering the influence eating self-efficacy could have on the outcomes of programs designed to change eating patterns, it was surprising

to find that only one study tested a construct similar to eating self-efficacy (i.e., dietary self-efficacy) as a moderator of intervention effects.

Saksvig et al. (2005) tested the moderating effects of dietary self-efficacy (e.g., belief that one can select healthy foods) on the outcomes of a healthy eating and exercise program designed to reduce the risk of diabetes among a sample of grade school children ( $N = 122$ ). At a 1-year follow up, higher dietary self-efficacy significantly moderated the link between dietary knowledge and healthy eating behaviors ( $OR = 3.7, p < .05$ ). These results imply that the children with higher dietary self-efficacy showed significantly more improvements in healthy eating behaviors than the children with lower dietary self-efficacy. Based on the findings in this study, it was predicted that participants in the intuitive eating intervention would vary in terms of their improvements in the outcome variables (i.e., intuitive eating, body image effects, dieting, and disordered eating attitudes) depending on their level of eating self-efficacy. Specifically, the present study evaluated eating self-efficacy as one of the moderators of the effects of the intuitive eating intervention. It was hypothesized that, after controlling for general self-efficacy, women with higher eating self-efficacy would demonstrate significantly more improvements in the outcome variables (i.e., increases in intuitive eating and positive body image effects and decreases in dieting and disordered eating attitudes) following the intervention compared to those with lower eating self-efficacy.

### *Screening Measure*

#### *Assessment of Eating Disorder Diagnoses*

Eating disorders have been found to be quite prevalent among nonclinical samples of college women (e.g., Mintz & Betz, 1988). Tribole and Resch (2003) advised that the intuitive eating framework may not be beneficial to individuals who are diagnosed with an

eating disorder. Depending on where individuals are in the eating disorder treatment process, they may or may not be ready to develop greater awareness to the body's physiological signs of hunger and fullness, especially in a brief intervention. It was beyond the scope of this study to assess the readiness of individuals who had been or were currently in treatment for an eating disorder. Thus, it was in the best interest of the potential participants as well as the goals of this study to exclude individuals who met this criterion. As such, the current study used a measure that generated eating disorder diagnoses to identify women who had a high likelihood of having an eating disorder.

Until recently, the only means to assess for Diagnostic and Statistical Manual for Mental Disorders' (4<sup>th</sup> ed.; DSM-IV) eating disorder diagnoses in a research setting was through structured diagnostic interviews. These interview-format assessment instruments include the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993) and the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon, & First, 1990). Although these are useful diagnostic tools, they limit the ease with which eating disorders can be assessed within studies requiring large sample sizes and also require specialized training to administer. Recognizing the need for more expedient diagnostic assessments, researchers have since developed two self-report measures that yield eating disorder diagnoses. These measures are the Questionnaire for Eating Disorder Diagnoses (Q-EDD; Mintz, O'Halloran, Mulholland, & Schneider, 1997) and the Eating Disorder Diagnostic scale (EDDS; Stice, Telch, & Rizvi, 2000).

The Q-EDD was considered for use in the current study, but on closer inspection it was determined the scale length would pose considerable response burden on participants completing the on-line screening. Specifically, the Q-EDD contains 50 items that were

adapted from the Weight Management Questionnaire (WMQ; Mintz & Betz, 1988, DSM-III-R revision of Ousley, 1986, DSM-III questionnaire). The Q-EDD yields categorical diagnoses as well as frequency data for disordered eating behaviors (e.g., self-induced vomiting). Categorical labels are manually assigned using flowchart decision rules. Compared to the other available diagnostic measure, the Q-EDD would require considerably more time to score and, as a result of manual scoring, more room for error. Based on these limitations, the Q-EDD was not selected for the current study.

Conversely, the EDDS (Stice, Telch, et al., 2000) is a relatively brief instrument that also produces categorical diagnostic labels and can be computer-scored. The EDDS is a 22-item self-report instrument that produces diagnoses for the three main DSM-IV eating disorders: anorexia nervosa, bulimia nervosa, and binge-eating disorder. Responses can be standardized to control for different response formats and summed (with the omission of the height and birth control use questions) to generate a composite score of eating disorder symptoms. The EDDS was adapted from the EDE (Fairburn & Cooper, 1993) and the SCID (Spitzer et al., 1990), both of which are validated structured psychiatric interviews.

In the original validation study, 367 females ranging in ages 13 to 65 were recruited from several ongoing studies across the United States and included mainly nonclinical (i.e., not in treatment for an eating disorder) individuals. Specifically, the validation sample included females with threshold and sub-threshold eating disorder symptoms ( $n = 185$ ); in treatment for anorexia, bulimia, or binge-eating disorder ( $n = 32$ ); and involved in a study on eating disorder risk factors ( $n = 109$ ). The majority of the sample were later classified as non-eating disordered by their EDDS scores ( $n = 253$ ). Showing strong criterion validity, the EDDS demonstrated consistent agreement with the structured diagnostic interview for

anorexia ( $\kappa = .93$ ), bulimia ( $\kappa = .81$ ), and binge-eating ( $\kappa = .74$ ; Stice, Telch, et al., 2000).

Similar criterion validity was noted in later studies with a predominantly nonclinical sample of females ( $N = 728$ ). Stice, Fisher, and Martinez (2004) cited a 96% consensus between the EDDS and the EDE for DSM-IV eating disorder diagnoses.

Convergent validity was examined by testing whether the EDDS-identified women with eating disorders also scored high on other measures of disturbed eating. As predicted, the eating-disordered individuals showed elevated scores on dietary restraint, eating, shape, and weight concerns ( $N = 217$ ; Stice, Telch, et al., 2000). Furthermore, as predicted, EDDS-identified individuals with anorexia scored significantly lower on disinhibited eating and those with binge-eating disorder showed lower dietary restraint scores. Test–retest reliability for the EDDS was high over a 1-week interval ( $r = .87$ ; Stice, Telch, et al.). Results from four studies with adolescent girls and young women ( $N = 728$ ), 289 of which were college students, suggested good internal consistency (mean  $\alpha = .89$ ; Stice et al., 2004). For the composite score, Mitchell, Mazzeo, Rausch, and Cooke (2007) reported the Cronbach's alpha was .76 among a sample of 252 female undergraduate students.

In conclusion, the EDDS was selected to assess for eating disorder diagnoses within the screening sample. This selection was made for several reasons. First, this instrument is supported in the literature as a diagnostic tool that can be used among college populations to determine whether individuals meet the DSM-IV criteria for an eating disorder. Second, the brevity of the EDDS would minimize the response burden and increase the likelihood of acquiring more complete data. Third, the computer algorithm scoring would allow for more expedient and accurate diagnostic assessment. Finally, this measure has demonstrated strong criterion and construct validity.

## *Outcome Measures*

### *Intuitive Eating*

Until recently, the integration of findings with regards to adaptive and disordered eating from the fields of nutrition and psychology has gone largely untouched. Making strides in this direction, Tylka (2006) introduced a measure of intuitive eating based on the intuitive eating model of healthy eating established by Tribole and Resch (1995, 2003). Currently, there is only one empirical measure of the intuitive eating construct. Thus the selection process for this instrument was quite straightforward. The measure that was used for the current study was the Intuitive Eating scale (IES; Tylka, 2006), which contains items informed by theories and empirical findings related to intuitive eating, unrestrained eating, and the promotion of adaptive eating practices.

The IES is a 21-item instrument comprising three subscales that measure aspects of intuitive eating. The subscales include: (a) Unconditional Permission to Eat, consisting of nine items; (b) Eating for Physical Rather Than Emotional Reasons, containing six items; and (c) Reliance on Internal Hunger and Satiety Cues, which has six items. Respondents rate items on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores suggest higher levels of intuitive eating. The IES total score ranges from 5 to 105. In its original format, the IES is a more trait-based instrument. However, the author granted permission for the scale instructions to be altered for the current study. To be consistent with the study's measured time points, the scale instructions asked the participants to respond to the scale items based on their attitudes and behaviors within the past week.

Assessing the psychometric properties of the IES, Tylka (2006) used four samples of college women who were predominantly Euro-American. Within one of the four samples,

exploratory and confirmatory factor analyses supported a three-factor structure, with Unconditional Permission to Eat accounting for 28%, Eating for Physical Rather Than Emotional Reasons 14%, and Reliance on Internal Hunger and Satiety Cues 7% of the variance in the IES total score ( $N = 391$ ). The IES subscale scores evidenced internal consistency reliability ( $\alpha s = .75$  to  $.91$ ; Tylka, 2006; Tylka & Wilcox, 2006). Furthermore, the subscale scores were highly correlated with the IES total score, supporting the use of the IES total score as a general measure of intuitive eating ( $r s = .60, .66,$  and  $.81$ ; Tylka, 2006). Test–retest reliability for the IES total score over a 3-week period was  $.90$  (Tylka, 2006). Supporting construct validity, the IES total score was significantly correlated in predicted directions with the Eating Attitudes Test-26 (EAT-26;  $r = -.66$ ; Garner, Olmsted, Bohr, & Garfinkel, 1982); body dissatisfaction ( $r = -.56$ ); pressure for thinness ( $r = -.55$ ); internalization of the thin–ideal stereotype ( $r = -.50$ ); and interoceptive awareness ( $r = -.49$ ; Tylka, 2006). Avalos and Tylka (2006) also found the IES total score significantly correlated with body appreciation ( $r = .63$ ) and focus on body function instead of appearance ( $r = .43$ ).

### *Body Image Effects*

Keeping consistent with the focus on adaptive attitudes and behaviors, the present study sought to assess the degree to which the participants experienced positive associations with regard to their body image. The extant measures of body image impart rather negative operational definitions of this construct, a practice which was incongruent with the current study’s emphasis on wellness in a research area that has been largely pathology-focused. Exemplifying the problem-focused language commonly used in measures of body image, an item within the widely-used Body Shape Questionnaire-Short Form (Evans & Dolan, 1993) reads, “Have you thought that your thighs, hips or bottom are too large for the rest of you?” It

was challenging to find a body image measure compatible with this study's aim of emphasizing a strength-based, wellness approach. The majority of the available body image instruments were determined inconsistent with this goal and thus not addressed within the following review.

Another consideration when choosing a measure of body image for the current study was the degree to which it accurately and comprehensively captures the impact of body image. Cash and Fleming (2002) advised that body image research often overlooks that body dissatisfaction may vary in the degree and nature of how it influences someone's life. For instance, dislike for one's weight may have variable implications across people. Where one person may be impacted within their social life another may only be affected in terms of their eating behaviors. Of the over 50 measures available in the body image literature, the vast majority focus exclusively on body dissatisfaction or body image investment but fail to address how self-perceptions and attitudes actually influence an individual's quality of life.

Neglecting to examine body image effects across different contexts (e.g., relationships and work-related experiences) and self-concept (e.g., feelings about the self) could result in a misinterpretation of findings. For example, in a study exploring the body image differences among Euro-American and African American females it was found that although the Euro-American sample had significantly higher body dissatisfaction than did their African American counterparts, the African American women had higher levels of body image investment (i.e., amount of time or energy devoted to improving physical appearance; Smith, Thompson, Racyznski, & Hilner, 1999). Based on these results, it would be inaccurate to conclude that body image investment necessarily places one at a higher risk for future psychological problems (e.g., disordered eating). However, if a measure were to evaluate the



impact of body image within one's life it would minimize the possibility of misleading conclusions when using only one measure in a study. Therefore, the present study incorporated a measure of this nature.

Currently, there is only one instrument that measures the impact of body image in one's life. The Body Image Quality of Life Inventory (BIQLI; Cash & Fleming, 2002) is designed to assess the impact of body image on feelings about the self, emotional states, eating and exercise, relationships, and sexual experiences. The BIQLI is a 19-item self-report instrument that directs participants to rate items on a 7-point Likert-type bipolar scale ranging from -3 (*very negative effect*) to +3 (*very positive effect*). Higher scores indicate that body image is a more positive influence on life experiences, whereas lower scores suggest that body image is a more negative influence on life experiences. Sample items include “[My body image affects] my satisfaction with life in general” and “[My body image affects] my experiences when I meet new people.”

In its original form, the BIQLI requests respondents to rate the items based on how “body image usually affects you.” For the purposes of the current study, a more state-based instructional format was needed to measure the body image construct in 1-week intervals. Following consultation with the author, permission was granted to alter the instructions within the scale in a manner consistent with the present study's design. Within the present study, the instructions directed participants to rate each item based on how “your body image has affected you during the past week.” Moreover, the item rating scale was altered to range from 1 (*very negative effect*) to 7 (*very positive effect*) to be consistent with the scoring sheets that participants used to complete the questionnaires.

Thus far only two studies have examined the BIQLI's psychometric properties. In the original validation sample of college women ( $N = 116$ ), internal consistency ( $\alpha = .95$ ) and test-retest reliability over a 2- to 3-week period ( $r = .79$ ) was supported (Cash & Fleming, 2002). Among tests of convergent validity, the BIQLI correlated in predicted directions with body satisfaction ( $r = .66$ ), body shame ( $r = -.33$ ), and internalized cultural standards of beauty ( $r = -.22$ ; Cash & Fleming). In the second validation study with a larger sample of university women ( $N = 468$ ), a principal component analysis was conducted and resulted in a one-factor solution, accounting for 50% of the item variance of the total score. Item loadings within the single factor ranged from .49 to .85 (Cash, Jakatdar, & Williams, 2004). Convergent validity was further evidenced by significant correlations between the BIQLI and body image dissatisfaction ( $r = -.54$ ), body image dysphoria ( $r = -.59$ ), and disordered eating attitudes ( $r = -.32$ ; Cash et al., 2004).

In conclusion, the BIQLI was chosen to assess how participants' body image impacts their sense of self and life experiences across various life domains. This selection was made for several reasons. First, this instrument was consistent with this study's focus on wellness and adaptive attitudes and behaviors. Second, the BIQLI provides a more accurate depiction of the impact of body image in one's life. Third, this scale is supported in the literature as a measure of body image among college female samples. Lastly, this measure demonstrated strong internal reliability and construct validity in relevant studies.

### *Dieting*

One of the most frequently used measures of dieting is the Dutch Restrained Eating scale (DRES; van Strien, Frijters, Van Staveren, Defares, & Deurenberg, 1986).

Unfortunately, it was cost prohibitive to use this scale for the current study as it is not in the public domain.

Another measurement of dieting that is commonly used and in the public domain is the Cognitive Behavioral Dieting scale (CBDS; Martz, Sturgis, & Gustafson, 1996). The CBDS is a 14-item, Likert-type scale with scores ranging from 14 to 70 that assesses dieting cognitions and behaviors within the previous 2 weeks; thus measuring states as opposed to traits. For the purposes of the current study, the author's permission was obtained to alter the CBDS to direct respondents to answer based on dieting thoughts and behaviors during the previous week. Originally developed for university students using a sample of female undergraduate and graduate students ( $N = 176$ ), the CBDS was deemed quite suitable for the purposes of the current study. Within a sample of college age females ( $N = 61$ ), the CBDS has demonstrated strong construct validity as evidenced by significant correlations with the Body Esteem scale (BES;  $r = -.60$ ; Franzoi & Shields, 1984) and the Three-Factor Eating Questionnaire-Restraint Factor subscale (TFEQ;  $r = .40$ ; Stunkard & Messick, 1985). Two-day test-retest reliability ( $r = .92$ ) and internal consistency ( $\alpha = .95$ ) for the one dieting factor were satisfactory as well (Martz et al.).

Criterion validity of the CBDS has been tested using multiple regression to assess predictors of caloric intake (assessed using 24-hour diet recall), including body mass index, calories needed for exercise, and CBDS scores. Results showed the CBDS was the only significant predictor of caloric intake ( $R^2 = .08$ ,  $p < .0001$ ), suggesting dieting reported on the CBDS is able to detect calorie intake from a 1-day food sample (Martz et al., 1996). As such, this scale's sensitivity to detect daily food intake was ideal for use in the current study's brief intuitive eating intervention. Also supporting the use of the CBDS in the present study, other

preventative efforts have used this scale to measure changes from pre- to posttest. Within a experimental–control study, Nicolino, Martz, and Curtin (2001) implemented a 2-hour cognitive–behavioral intervention targeting improvements in body image and reduction of dieting. In the experimental group ( $n = 45$ ), the female participants showed a trend of decreased dieting compared to the control group ( $n = 40$ ). Although this was not a statistically significant finding, the selection of this measure for the current study was appropriate given that the CBDS was sensitive enough to pick up discrete changes in dieting following a very brief intervention.

In conclusion, the CBDS was chosen to assess the construct of dieting in this study. This selection was made for number of reasons. First, this instrument is supported in the literature as a general measure of dieting among college women. Second, the scale was available at no cost. Third, this measure has demonstrated strong internal reliability and construct validity. Lastly, the CBDS appears sensitive to intervention effects.

### *Disordered Eating Attitudes*

Given that one of the goals of the present study’s intervention was to reduce the risk for future disordered eating, it was decided to also incorporate a measure of disordered eating attitudes. There are several available measures of psychological and behavioral traits associated with disordered eating. Thus, selecting a suitable measure was a challenging endeavor. This section will explore two of the most popular measures of disordered eating attitudes and provide a justification for the measure chosen for this study.

One of the more widely used self-report instruments measuring cognitive and behavioral characteristics associated with disordered eating symptoms is the Eating Attitudes Test-40 (EAT-40) developed by Garner and Garfinkel (1979) using a clinical sample ( $N =$

300). The EAT-40 was later modified to the Eating Attitudes Test-26 (EAT-26; Garner et al., 1982), which was the measure chosen to assess disordered eating attitudes in the present study. Currently, the EAT-26 is a frequently used self-report measure of eating disorder symptomatology. At the time of the EAT-40 development, bulimia nervosa was not a recognized diagnosis within the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [APA], 1968). Thus, in its original conception, the EAT-40 measured attitudes and behaviors associated with anorexia nervosa, the only type of eating disorder classification at that time. In reality however, the items included in the EAT-40 assessed symptoms that have since been incorporated into the diagnostic category of bulimia (DSM-IV; APA, 1994).

The EAT-40 consisted of 40 items measuring dieting, bulimic symptoms, and oral control. The original factor analysis revealed three main latent factors, with 14 items not adequately loading on any factor. These 14 items were excluded, resulting in 26 items that comprise the EAT-26 (Garner et al., 1982). The EAT-26 directs respondents to rate on a 6-point Likert-type scale how often each disordered eating attitude or behavior applies to them, ranging from *always* (3) to *never* (0). Garner et al. (1982) recommended that the item responses never, rarely, and sometimes receive a score of 0 and the responses often, very often, and always receive scores 1, 2, 3, respectively. However, recent studies have used scores ranging from 6 (*always*) to 1 (*never*) to prevent a skewed distribution (e.g., Tylka & Subich, 2004). Following this reasoning, the present study used scores ranging from 6 (*always*) to 1 (*never*).

Supporting the convergent validity of this instrument, Berland, Thompson, and Linton (1986), also using a clinical sample, demonstrated strong EAT-26 total score

correlations with the EAT-40 and the Eating Disorder Inventory, Drive for Thinness subscale (EDI; Garner, Olmsted, & Polivy, 1983),  $r = .90, .77$ , respectively. Furthermore, Mazzeo (1999) found the EAT-26 and the Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991) total scores were highly correlated as well in a nonclinical sample ( $r = .79$ ). Although the EAT-26 has been described as a measure of anorexia and bulimia, this inventory was not empirically validated in a nonclinical sample for these purposes until the past decade.

In a sample of college women, Mintz and O'Halloran (2000) found the EAT-26 total score discriminated between those with and without an established eating disorder diagnosis with 90% accuracy. Moreover, the mean score differentiated between diagnosed, symptomatic, and asymptomatic women. As such, these results supported the use of this scale as a continuous measure of disordered eating in nonclinical samples. Furthermore, Mazzeo (1999) provided additional psychometric support for using the EAT-26 as a general measure of disordered eating in a college sample of women (Cronbach's  $\alpha = .92$ ). Although the original developers reported a three factor solution for the EAT-26, a recent study suggested a five factor solution may be more appropriate (Doninger, Enders, & Burnett, 2005). However, considering the objectives of the present study, a general measure of disordered eating was needed. As such, the factor structure discrepancy among these studies did not contraindicate using the EAT-26 total score.

Another popular self-report measure of disordered eating attitudes and behaviors is the Eating Disorder Inventory-2 (EDI-2; Garner, 1991). Combined with its predecessor, the EDI (Garner et al., 1983), these scales have been used in over 400 published studies (Espelage et al., 2003). Using data from the original sample, the only change from the EDI to

the EDI-2 has been the addition of three provisional subscales. One of central strengths of the EDI-2 is that it contains subscales assessing eating and weight as well as psychological and personality correlates of disordered eating. More specifically, the EDI-2 includes 91 items rated according to a 6-point Likert-type scale and has three subscales measuring attitudes and behaviors about weight, eating, and body shape; five subscales assessing personality constructs; and three provisional subscales tapping other psychological characteristics. Respondents are asked to rate the degree to which each item applies to them, ranging from *always true of me* (3) to *never true of me* (0). Many researchers have found the EDI and the EDI-2 particularly useful in differentiating between clinical and subclinical respondents (Tylka & Subich, 1999).

Studies assessing the psychometric properties of the EDI-2 include mixed results. For example, Raciti and Norcross (1987) reported a low correlation between the Bulimia subscale of the EAT-26 and the EDI Body Dissatisfaction subscale ( $r = .35$ ), which in theory should be strongly related. However, internal consistency alphas were in an acceptable range from .80 to .92 among the eight main subscales. The authors did not report the Cronbach alpha for the total score. Results from confirmatory factor analysis only partially supported the originally proposed eight factor solution, suggesting cautionary interpretations of the individual subscales (Espelage et al., 2003). Similarly, Klemchuk, Hutchinson, and Frank's (1990) factor analytic study yielded a six factor model, accounting for only 41% of the total variance and recommended further study of the two main factors for the purposes of assessing disordered eating. Moreover, Garner (1991) recommended the subscales be used individually as the low intercorrelation between subscales suggests they are measuring distinct constructs instead of a general measure of eating disorder symptomatology.

In conclusion, the EAT-26 was selected to measure the construct of disordered eating attitudes in this study. This selection was made for several reasons. First, this instrument is supported in the literature as a general measure of disordered eating in a college sample. Second, the brevity of the EAT-26 would minimize the response burden and increase the likelihood of acquiring more complete data. Finally, this measure has demonstrated strong internal reliability and construct validity.

### *Measuring the Moderators*

#### *Emotional Awareness*

The current study sought to measure participants' ability to be aware of and describe their emotions. A review of the literature revealed a few possible instruments to use for this purpose. Two scales measuring emotional awareness are only commercially available and are quite costly. As such, they were not selected for the current study. These instruments include the Bar-On Emotional Quotient Inventory (EQ-I; Bar-On, 1997) and the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Caruso, & Salovey, 2000). Two other self-report scales were identified that are in the public domain. This section will explore these measures and provide a justification for the instrument chosen for this study.

The less empirically tested and supported of the two available public domain instruments is the Emotional Intelligence scale (EI scale; Schutte et al., 1998). From its inception, the EI scale has not been supported as a psychometrically sound measure. Specifically, the factor structure does not appear stable across studies. Originally, the developers suggested a one factor solution after claiming the initial four factors extracted were not interpretable (Schutte et al.). In a follow-up study examining the EI scale's factor structure, Petrides and Furnham (2000) reported a four factor solution, critically proclaiming



the current form of the EI scale as psychometrically unsatisfactory. Similarly, among a sample of 354 college undergraduates, Saklofske, Austin, and Minski (2003) replicated the four factor structure found in the previous study and recommended the generation of additional items for rederiving the EI scale's factor structure. In light of these psychometric problems, this measure was not chosen for the current study.

With a substantial amount of support from measurement and experimental studies, the Toronto Alexithymia scale (TAS-20; Bagby et al., 1994) is a widely used 20-item self-report measure that taps respondents' difficulty with identifying and describing emotions. Respondents are directed to rate items on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). To obtain a total score, items are summed, with higher scores indicating greater degrees of alexithymia. The total score ranges from 20 to 100.

The TAS-20 total score has demonstrated good internal consistency among nonclinical samples ( $n = 1933$ ;  $\alpha = .86$ ; Parker, Taylor, & Bagby, 2003). The TAS-20 has also consistently demonstrated discriminant validity, showing significant inverse correlations with emotional intelligence ( $r = -.72$ ; Parker, Taylor, & Bagby, 2001); openness with feelings ( $r = -.39$ ; Luminet, Bagby, Wagner, Taylor, & Parker, 1999) among nonclinical samples.

In summary, the TAS-20 was chosen to evaluate participants' level of emotional awareness in the present study. This instrument was selected based on its support in the literature as a measure of emotional awareness among nonclinical samples. Furthermore, the TAS-20 has evidenced strong internal consistency and construct validity.

### *Eating Self-Efficacy*

The current study also measured self-efficacy with regard to eating behaviors. A review of the literature revealed there were only two instruments measuring this construct: the Weight Efficacy Life-Style Questionnaire (WEL; Clark, Abrams, & Niarura, Eaton, & Rossi, 1991) and the Eating Self-Efficacy scale (ESES; Glynn & Ruderman, 1986). Both of these instruments were adapted from Condiotte and Lichtenstein's (1981) measure for smoking cessation self-efficacy.

On the WEL questionnaire, items are rated on a 10-point Likert-type scale ranging from 0 (*not confident*) to 9 (*very confident*) with regard to how confident respondents are about their ability to resist eating in various situations. The WEL scale was originally designed for use in obesity treatment or weight loss programs. This measurement intent is quite evident from the manner in which the items are phrased. Sample items include: "I can resist eating when there are many different foods around," "I can resist eating when I am reading," "I can resist eating when I have a headache," "I can resist eating even when I am at a party," and "I can resist eating when I am watching TV." Taking into account the language used in the items, it was determined this scale would not be appropriate for use in the current study for a couple of reasons. First, the use of the sentence stem "I can resist" is counter to the philosophy of intuitive eating in that the intuitive eating model encourages following physiological hunger cues and not "resisting" foods per se. Second, the types of eating situations presented within the scale were not normed for the college population. Meaning, the scale's language does not adequately reflect eating situations relevant to college students. Conversely, normed for college students, the ESES offered a suitable alternative to assess eating self-efficacy within the present study.

Despite the applicability of the ESES to the college population, only two studies using this measure were found in the literature. In the initial factor analyses, the ESES was administered to samples totaling 690 undergraduate students. The principal component factor analyses supported three factors comprising the final 25-item version of the ESES. Examining the psychometric properties of the ESES among a sample of female college students ( $N = 484$ ), the internal consistency reliability of the total score was found to be strong ( $\alpha = .92$ ). The test-retest reliability was lower than desired, but adequate across a 7-week period ( $r = .70$ ). Supporting construct validity, the ESES was positively correlated with dietary restraint ( $r = .47$ ), previous dieting ( $r = .23$ ), and current dieting ( $r = .24$ ). As expected, the ESES total score was negatively correlated with self-esteem ( $r = -.51$ ). Predictive validity was evidenced by significant associations between the ESES total score and weight loss over time among a sample of individuals involved in a community weight loss program ( $N = 32$ ; Glynn & Ruderman, 1986). Moreover, ESES scores significantly predicted eating behavior change among a nonclinical sample of females participating in a 10-week weight loss course ( $N = 180$ ; Shannon et al., 1990).

In conclusion, the ESES was chosen to assess eating self-efficacy within the current study. This selection was made for several reasons. First, the ESES is supported in the literature as a measure of eating self-efficacy among college female samples. Third, this measure has demonstrated strong internal consistency reliability and construct validity.

### *Hypotheses*

#### *Main Effects*

In summary, there were three sets of hypotheses in the present study. First, relative to the control group, the intuitive intervention group would demonstrate significantly greater

improvements in the outcome variables (i.e., improvements in intuitive eating and positive body image effects and decreases in dieting and disordered eating attitudes at the posttest and delayed 1-week and 2-week follow-up assessments, after controlling for the initial level of each outcome variable.

### *Moderation Effects*

Second, it was hypothesized that emotional awareness would moderate the effects of the intuitive intervention program on intuitive eating, body image effects, dieting, and disordered eating attitudes at the posttest and delayed 1-week and 2-week follow-up assessments. Specifically, those with higher emotional awareness would report significantly greater improvements (i.e., improvements in intuitive eating and body image effects and decreases in dieting and disordered eating attitudes) at the posttest and delayed 1-week and 2-week follow-up assessments compared with those who had lower emotional awareness, after controlling for the initial level of each outcome variable.

Finally, after controlling for general self-efficacy, eating self-efficacy would moderate the effects of the intuitive intervention program on intuitive eating, body image effects, dieting, and disordered eating attitudes at the posttest and delayed 1-week and 2-week follow-up assessments. That is, relative to those with lower eating self-efficacy, those with higher eating self-efficacy would demonstrate significantly greater improvements (i.e., improvements in intuitive eating and body image effects and decreases in dieting and disordered eating attitudes) at the posttest and delayed 1-week and 2-week follow-up assessments, after controlling for the initial level of each outcome variable.

## CHAPTER THREE: METHODS

### *Power Analysis*

To estimate the number of participants needed to obtain a small to medium effect size, an a priori power analysis was calculated using a sample size requirement formula for a repeated-measures design compliments of D. Bonett (personal communication, April 29, 2010). The planning effect size value was chosen based on previous eating disorder prevention literature. Specifically, a recent experimental study examining the effects of an eating disorder prevention program reported intervention effect sizes for dieting ( $r = .14, p = .001$ ) and body dissatisfaction ( $r = .20, p < .001$ ; Stice et al., 2006). Taking into account these effect size coefficients, a Cohen's  $d$  of .25 (small effect) was chosen to produce a more conservative sample size estimation to detect small to moderate effects. Thus, the input effect size was set at .25,  $\alpha$  error probability at .05, power .80, and averaged correlation among repeated measures .8. Results indicated the total sample size would need to be  $N = 60$  (or about 30 per group) to obtain sufficient power. Considering a possible attrition rate of 20–30% within a study requiring repeated attendance, a sample size of roughly 40 per group was chosen to yield a small to medium effect size.

### *Participants*

This study involved two phases: (a) a screening phase to identify participants for the study on the basis of specific inclusion and exclusion criteria and (b) an experimental phase comparing an intuitive eating program to a control condition. The use of a control condition in this type of study is supported in the literature to control for the possible effects of the passage of time and pretest sensitization on the outcome variables (Stice & Shaw, 2004). Participants in these two phases were recruited from a pool of female college students over

the age of 18 and enrolled in introductory psychology courses at a large Midwestern university. Participant recruitment took place from Spring term 2008 to Fall term 2008 (i.e., March to October). A total of 484 undergraduate women completed the screening survey. Screening participants ranged in age from 18 to 51 ( $M = 19.55$ ,  $SD = 2.73$ ) and identified themselves as Euro-American (86.1%), African American (2.1%), Asian American (2.7%), Latina (2.9%), Native American (0.2%), multiethnic (1.9%), international student (3.3%), and other (0.8%). The majority of screening participants identified as first-year students (50.6%); of the remaining participants, 20.9% were sophomores, 14.7% were juniors, 12.8% were seniors, and 0.9% identified as other. Screening participants included those who identified as single (45.7%), in a committed relationship (51.2%), and married (2.3%), and 0.6% selected the other category to designate their status. Responses from the screening participants indicated that 2.7% ( $n = 13$ ) had been or were currently receiving treatment for an eating disorder, 6.8% ( $n = 33$ ) were currently prescribed psychotropic medication, 6.8% ( $n = 33$ ) identified as a student athlete, 1.9% ( $n = 9$ ) were currently under medical supervision for weight loss or gain, 2.9% ( $n = 14$ ) were currently involved in Weight Watchers, 4.6% ( $n = 22$ ) reported food-related allergies or digestive concerns, and 20.2% ( $n = 97$ ) declined participation in the second part of the study (i.e., intervention or control group). A total of 37 screening participants (13.1%) were identified by the EDDS screening measure as meeting diagnostic criteria for anorexia, bulimia, or binge-eating disorder.

Of the remaining participants ( $n = 179$ ), 72 volunteered to participate in the second part of the study and were randomly selected for the intervention or control group. Several invited participants declined continued participation in the study because they had already earned the allowed amount of research credits for their psychology course. One person who

volunteered was unable to complete the study beyond the pretest due to a family death. The intervention and control group data set included participants who ranged in ages from 18 to 27 ( $M = 19.70$ ,  $SD = 2.06$ ) and identified themselves as Euro-American (91.7%), African American (2.8%), Asian American (2.8%), multiethnic (1.4%), and international student (1.4%). Of these participants, 48.6% were first-year students, 22.2% were sophomores, 11.1% were juniors, 15.3% were seniors, 1.4% identified as a graduate student, and 1.4% selected the other category to specify their year in school. Relationship status for the intervention and control group participants included those who identified as single (47.2%), in a committed relationship (50.0%), and married (2.8%).

### *Measures*

#### *Screening Survey Items and Measures*

*Demographic questionnaire.* Participants were asked to complete brief questions soliciting information about their age, year in school, relationship status, ethnicity, e-mail address, phone number, and last six digits of their Iowa State University student identification number. Participants were also asked to answer seven additional questions. The first question was to assess whether they had been or currently were in treatment for an eating disorder. The item asked respondents to answer yes or no to the question: “Have you been or are you currently in treatment or receiving counseling services for an eating disorder?” The second question was to determine whether or not they were currently prescribed medication for an emotional concern. Specifically, participants were asked to answer yes or no to the question “Are you currently prescribed medication for an emotional concern?” The third question was to determine if the participant was currently an athlete. Participants were asked to answer yes or no to the question “Are you a student athlete?” The

fourth question was to assess whether or not participants were currently receiving medical care with regard to their weight. Participants were asked to answer yes or no to the question “Are you under a physician's or registered dietitian's care for eating, for attaining or monitoring of either weight gain or loss?” The fifth question, again asking participants to respond yes or no, was “Are you currently involved in a Weight Watchers program?” The sixth question also asked participants to respond yes or no and was “Do you have any food allergies or digestive difficulties for which you have or are receiving medical treatment?” The final question asked participants to answer yes or no to the following: “If you are eligible to participate in the second phase of the study, would you like to be contacted by the researcher to arrange for the next meeting?”

*Eating disorder diagnosis.* The possibility of participants meeting the diagnostic criteria for an eating disorder was assessed through the use of the Eating Disorder Diagnostic scale (EDDS; Stice, Telch, et al., 2000). Participants completed the EDDS, a 22-item self-report questionnaire that generates eating disorder diagnoses (i.e., anorexia nervosa, bulimia nervosa, and binge-eating disorder) within the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; APA, 1994)*. The EDDS also produces a composite score for eating disorder symptoms. The EDDS items were derived from a structured psychiatric diagnostic interview: the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993) and the Structured Clinical Interview for DSM-III-R (SCID; Spitzer et al., 1990). A sample item is “How many times per week on average over the past 3 months have you engaged in excessive exercise specifically to counteract the effects of overeating episodes?” Scoring for this scale is accomplished manually or using a computer algorithm.



The EDDS composite score has shown good temporal stability ( $r = .87$ ) and internal consistency (mean  $\alpha = .89$ ) in a sample of adolescent and college age females ( $N = 728$ ; Stice et al., 2004). Similarly, in a community sample (ages ranging from 13 to 65) of females with ( $n = 114$ ) and without eating disorders ( $n = 103$ ) the categorical diagnoses demonstrated strong test–retest reliability (mean  $\kappa = .80$ ) and criterion validity with structured interview diagnoses (mean  $\kappa = .83$ ; Stice, Telch, et al., 2000). Moreover, the EDDS-identified females with eating disorders also scored higher on validated measures of disordered eating relative to EDDS-identified females without an eating disorder ( $N = 217$ ; Stice, Telch, et al., 2000).

In later assessments of the EDDS in a sample of adolescent and undergraduate females ( $N = 728$ ), Stice et al. (2004) found strong criterion validity when comparing diagnoses generated by the EDDS and those via the gold standard EDE interview. The positive specificity rating, meaning the degree of consistency between the EDE-identified diagnoses and those also identified by the EDDS, was .88. Further supporting criterion validity, the negative specificity rating in the same sample was .98. The overall agreement rate between the EDDS and the EDE for DSM-IV eating disorder diagnoses was 96%. Supporting good convergent validity, Stice et al. (2004) found strong correlations between the EDDS symptom composite score and risk factors associated with eating disturbances (e.g., body dissatisfaction,  $r = .52$ ; dieting,  $r = .69$ ; thin–ideal internalization,  $r = .46$ ). The EDDS was also found to be sensitive to detect intervention effects in a program consisting of three 1-hour sessions. Demonstrating good predictive validity, the interaction between the treatment condition and EDDS scores, after controlling for initial EDE scores, predicted posttest EDE scores, with 4% of the variance in pre- to posttest EDE scores explained (Stice et al., 2004).

*Pretest, Posttest, and Follow-Up Assessment Measures*

*Emotional awareness.* The Toronto Alexithymia scale (TAS-20; Bagby et al., 1994) was used to assess participants' level of emotional awareness. The TAS-20 is a 20-item self-report instrument that measures respondents' difficulty with identifying and communicating feelings as well as degree of externally oriented thinking. Each item is rated on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores range from 20 to 100 and scores equal to or above 61 indicate the presence of alexithymia. However, for the purposes of presenting the results in a consistent manner across instruments, the items were reverse-scored whereby higher scores were indicative of greater emotional awareness. Sample items include "It is difficult for me to find the right words for my feelings" and "I don't know what's going on inside me." Suggesting good internal consistency, the Cronbach alpha has been reported at .82 among a sample of female patients with an eating disorder (Carano et al., 2006). Also, among a sample of college undergraduates ( $N = 286$ ), Zimmermann, Rossier, Meyer de Stadelhofen, and Gaillard (2005) noted the TAS-20 internal consistency alpha as .75. The TAS-20 has shown construct validity through significant correlations with theoretically related variables including body image disturbance ( $r = .49$ ) and self-esteem ( $r = -.66$ ; Carano et al.). In the current study, the internal consistency alpha for this measure was .83.

*Eating self-efficacy.* The Eating Self-Efficacy scale (ESES; Glynn & Ruderman, 1986) was used to measure the construct of eating self-efficacy. This self-report instrument comprises 25 items that are rated on a 7-point Likert type scale ranging from 1 (*complete confidence to control eating*) to 7 (*no confidence to control eating*). The total score ranges from 25 to 155. Higher scores are generally indicative of higher eating self-efficacy.

However, for the purposes of presenting the results in a consistent manner across instruments, the items were reverse-scored whereby higher scores were indicative of greater eating self-efficacy. With the sentence stem “How confident are you that you can control . . .” sample items include “. . . overeating when you feel upset” and “. . . overeating when you want to sit back and enjoy some food.”

Among a sample of university women ( $N = 484$ ), internal consistency reliability of the total score was strong ( $\alpha = .92$ ). In the current study, the internal consistency of this measure was .96. The test–retest reliability was adequate across a 7-week period ( $r = .70$ ). Supporting convergent validity, the ESES was positively correlated with dietary restraint ( $r = .47$ ), previous dieting ( $r = .23$ ), and current dieting ( $r = .24$ ). As expected, the ESES total score was negatively correlated with self-esteem ( $r = -.51$ ), suggesting divergent validity. Predictive validity was evidenced by significant associations between the ESES total score and weight loss over time among a sample of individuals involved in a community weight loss program ( $N = 32$ ; Glynn & Ruderman, 1986). Moreover, ESES scores significantly predicted eating behavior change among a nonclinical sample of females participating in a 10-week weight loss course ( $N = 180$ ; Shannon et al., 1990).

*General self-efficacy.* To examine the unique effects of eating self-efficacy above and beyond general self-efficacy, the General Self-Efficacy scale (GSES; Sherer et al., 1982) was used to control for the construct of general self-efficacy. This is a 17-item self-report measure of general expectations of self-efficacy that are not tied to specific situations or behavior. Respondents are directed to rate each item from 1 (*disagree strongly*) to 5 (*agree strongly*) based on how each statement applies to their personal attributes and traits. The

score ranges from 17 to 85. The developers reported the good internal consistency with alpha of .86. In the current study, the internal consistency alpha was .84.

*Intuitive eating.* The Intuitive Eating scale (IES; Tylka, 2006) is a 21-item self-report scale designed to assess central features of intuitive eating including (a) unconditional permission to eat when hungry and to eat food desired at any given moment, (b) eating based on physical instead of emotional needs, and (c) reliance on internal cues to determine when and how much to eat. Participants rate the items on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate higher levels of intuitive eating. Sample items include “I can tell when I slightly full” and “I trust my body to tell me when to eat.” With samples of college females, studies have reported good internal consistency ( $\alpha = .89$ ) and test–retest reliability over a 3-week period ( $r = .90$ ; Avalos & Tylka, 2006). In the current study, the 3-week test–retest reliability was lower than this previous study ( $r = .76$ ), but sufficient. Supporting construct validity, the IES is correlated in theoretically expected directions with eating disorder symptoms ( $r = -.69$ ), body dissatisfaction ( $r = -.56$ ) and poor interoceptive awareness ( $r = -.49$ ; Tylka, 2006).

*Body image effects.* The Body Image Quality of Life Inventory (BIQLI; Cash & Fleming, 2002) is a 19-item self-report inventory that quantifies the degree to which body image influences various life domains (e.g., social functioning, sense of self, eating, and sexuality). In its original form, respondents rate the impact of their body image using a 7-point bipolar scale ranging from -3 to +3, allowing for negative, positive, or no impact. Original scoring ranges from -57 to 57, with higher scores indicating one’s body image imparts greater degrees of positive influence on one’s life. The original instructions for this scale request participants to base their responses on how their body image “usually” affects

them. However, to meet the current study's objectives the instructions prompted respondents to answer the items based on how their body image had affected them during the previous week. Adaptations to body image measures, such as the one included in the current study, are supported in the literature (J. K. Thompson, 2004). Sample items include "[My body image affects] my day-to-day emotions" and "[My body image affects] my relationships with friends." Among female undergraduates ( $N = 111$ ), reported internal consistency of the BIQLI was good ( $\alpha = .95$ ) and test-retest reliability over a 2- to 3-week period appears strong ( $r = .79$ ; Cash & Fleming). The 3-week test-retest reliability in the current study was adequate ( $r = .76$ ). Convergent validity appears promising as well, with significant correlations with higher body satisfaction ( $r = .66$ ) and body shame among college age women ( $r = -.33$ ; Cash & Fleming).

*Dieting.* The Cognitive Behavioral Dieting scale (CBDS; Martz et al., 1996) is a 14-item self-report measure that assesses respondents' dieting behavior and thoughts over the previous 2 weeks. Each item is rated on a 5-point Likert-type scale with responses ranging from 1 (*never*) to 5 (*always*) and 1 (*disagree*) to 5 (*strongly disagree*). The 14 items are summed to produce a total score. Scores range from 14 to 70, with higher scores indicating greater degrees of restrictive dieting and weight concern. However, for the purposes of presenting the results in a consistent manner across instruments, the items were reverse-scored whereby higher scores were indicative of improvements (i.e., less dieting). Sample items include "I have used the nutritional labels on foods to determine if I eat a certain food or not" and "I have eaten foods that I don't prefer just because they are low in calories."

Martz et al. (1996) reported strong internal consistency ( $\alpha = .95$ ) and a 2-day test-retest reliability of  $r = .95$  among college age females and males. In the current study, the 3-

week test–retest reliability was strong ( $r = .81$ ). Moreover, the CBDS was significantly correlated with body image esteem ( $r = -.53$ ) and dietary restraint ( $r = .60$ ), suggesting good construct validity among a sample of female undergraduate students ( $N = 176$ ). The original instructions request that the participants base their responses on their cognitions and behaviors over the previous 2 weeks. However, to meet the current study’s objectives the instructions asked respondents to answer the items based on their cognitions and behavior during the previous week. Alterations of the scale instructions in this manner are supported in the literature (Martz et al.).

*Disordered eating attitudes.* The Eating Attitudes Test-26 (EAT-26; Garner & Garfinkel, 1979) was used as a general measure of disordered eating outcomes. The EAT-26 is a 26-item self-report measure that assesses characteristic attitudes and behaviors associated with disordered eating. Based on Tylka and Subich’s (2004) suggestion, the items were rated on a 6-point Likert-type scale with responses ranging from 1 (*never*) to 6 (*always*). There are three subscales for this measure: Dieting (e.g., “[I am] aware of the calorie content in the foods I eat”), Bulimia (e.g., “[I] have the impulse to vomit after meals”), and Oral Control (e.g., “[I] avoid eating when I am hungry”). In addition, the original instructions request that the participants base their responses on how often each item generally applies to them. However, to meet the current study’s objectives the instructions prompted respondents to answer the items based on how often each item applied to them during the previous week. Although there were not examples of longitudinal studies adapting the EAT-26 in this manner, there were examples of adaptations to similar measures of disordered eating. For example, Stice et al. (2007) used the EDDS at weekly intervals to assess intervention effects, finding significant reductions in bulimic symptoms over time.

Although there are three subscales, use of the total score in a college sample is supported in the literature (e.g., Tylka, 2004; Tylka & Subich, 2004). Therefore, in the present study the total score was used, with a higher score (ranging from 26 to 156) indicating a higher level of disordered eating attitudes. However, for the purposes of presenting the results in a consistent manner across instruments, the items were reverse-scored whereby higher scores were indicative of improvements (i.e., less disordered eating attitudes). Internal consistency for the EAT-26 ranges from .90 (Miller, Schmidt, Vaillancourt, McDougall, & Laliberte, 2006) to .91 (Mazzeo, 1999) in college female samples. This scale has also demonstrated good stability over a 3-week interval among a sample ( $N = 302$ ) of female undergraduates ( $r = .86$ ; Mazzeo). In the current study, the 3-week test–retest reliability indicated strong temporal stability ( $r = .86$ ).

Among an outpatient sample of 81 women who self-identified as having an eating disorder, Berland et al. (1986) found the total score of EAT-26 had high convergent validity with the total score of Eating Attitudes Test-40 (EAT-40) developed by Garner and Garfinkel (1979;  $r = .90$ ). Also within the same sample, high convergent validity was also demonstrated between the EAT-26 total score and the following measures: all subscales of Eating Disorder Inventory (EDI; Garner et al., 1983) and the total score of the Eating Inventory (EI; Stunkard, 1981).

### *Procedures*

The present study's procedural flowchart and a complete listing of screening, pretest, posttest, and follow-up measures are available in Appendices A and B, respectively.

### *Screening Procedure*

Prior to participant screening, I obtained the Iowa State University Institutional Review Board's approval to conduct a study with human subjects. Students voluntarily signed up for this study electronically using the Department of Psychology's Sona Research System (see Appendix C for Sona posting sheet). The study's description involved inviting students to participate in an on-line screening to determine their eligibility and interest in participating in an intuitive eating study. Participants were informed that the screening process would take about 15–20 minutes to complete and that they would be given one research credit toward their psychology course grade for their participation.

After the potential participants signed up on the Sona Research System, they were able to access an Internet link to [surveymonkey.com](https://www.surveymonkey.com) where the informed consent and screening questionnaires were posted for completion. After linking to the survey site, participants first viewed the screening informed consent (see Appendix D) and were directed to click on the “I Agree and Continue” button, indicating their consent to complete the screening stage of the study.

After consenting to participate in the screening, participants were directed to answer demographic questions; questions regarding current or past eating disorder treatment, current use of psychotropic medication, student athlete status, medical supervision of weight loss or gain, Weight Watcher's involvement, medical treatment for past or current food allergies or digestive concerns, and a question regarding interest in continued participation in the second phase of the study; and the EDDS. Following completion of the questionnaire, a debriefing form (see Appendix E) was displayed on the subsequent webpage. The debriefing form explained the possible emotional impact following completion of the survey and provided



contact information for the principal investigator, faculty supervisor, the Iowa State University Student Counseling Service, and the Office of Research Assurances.

Participants were granted one research credit toward their psychology course grade on the Sona Research System and notified by e-mail whether or not they were eligible to continue with the second stage of the study. In order to apply research credits to participants' psychology course grade, participants' e-mail addresses attached to their surveymonkey.com responses were used to locate and assign one credit to participants on the Sona System.

#### *Eligibility Determination*

In order to participate in the second phase of the study, screening participants must have met certain inclusion and exclusion criteria. Inclusion criteria included (a) female, (b) at least 18 years old, (c) granted informed consent to complete the screening survey, and (d) indication of interest in learning more about and potentially participating in the second stage of the study. Exclusion criteria included (a) had been or were currently in treatment for an eating disorder, (b) met criteria for an eating disorder based on results from the EDDS, (c) were currently prescribed psychotropic medication, (d) currently a student athlete, (e) current involvement in Weight Watcher's program, (f) currently under medical supervision for weight loss or gain, and (g) past or current food allergies or digestive concerns.

These exclusion criteria were informed by previous eating disorder prevention research (e.g., Celio et al., 2000; Mann et al., 1997; Zabinski et al., 2004). Empirical research suggests that primary (i.e., preventing new clinical cases) and secondary (i.e., reducing duration of existing clinical cases) interventions are better implemented separately because they seek different outcomes that may require interventions that oppose one another (Mann et al.). Moreover, individuals with a chronic history of diagnosable eating disorder symptoms

may be unable to cognitively and physically recognize when they are hungry or full. As such, the intuitive eating model may be beneficial only at certain stages of eating disorder treatment (Tribole & Resch, 2003). It was beyond the scope of this study to assess the readiness of individuals who had been or were currently in treatment for an eating disorder. Thus, it was in the best interest of the participants as well as the goals of this study to uphold these exclusion criteria. Lastly, excluding individuals who were currently prescribed psychotropic medication was intended to rule out the possibility that the effects of the medication could have influenced the outcomes of the study. Without controlling for potential confounding listed above, the ability to infer causality may have been compromised. If a screening participant met any of the exclusion criteria, she was notified within 1 week via e-mail that she was not selected for the study (see Appendix F for e-mail notification template).

*Design: Intervention and Control Groups*

Eligible participants were randomly selected for either the intuitive eating intervention group or the control group. Screening participants who met the inclusion criteria were contacted within 1 week via e-mail and informed they would be contacted by telephone by the principal investigator to schedule three subsequent sessions to complete the in-person portion of the study's second phase (see Appendix F for e-mail notification template). Each participant was offered to schedule and attend a total of three sessions and complete three on-line follow-up assessments. All sessions and follow-up dates were scheduled during this initial phone call and reminder e-mails were sent to the participants (see Appendix G for follow-up e-mail template). Session dates were arranged according to the participants' class times, which were either Monday, Wednesday, and Friday or Tuesday and Thursday

schedules. The first session was scheduled 1 to 2 weeks after the screening, the second session occurred 2 days following the first session, the third session took place 5 days after the second session, the on-line posttest assessment took place 2 days following the third session, the first on-line follow up was arranged 1 week after the third session, and finally the second follow up was arranged 1 week after the first follow up. Stice and Shaw (2004) found several effective intervention programs of three to four sessions in length in their meta-analytic review, supporting this study's use of a three-session design.

To protect the confidentiality of the participants to the best extent possible and also support the integrity of the study, the following measure was taken: participants' were assigned an arbitrary identification number at the pretest data collection time, preventing the identification of their name with their responses on the pretest, posttest, and follow-up surveys. However, they were asked to provide the last six digits of their school identification numbers at each data collection point to help ensure participants' responses were properly tracked over the course of the study.

### *Intervention Group Design*

Participants assigned to the intervention group were informed that during the first session (i.e., pretest) they would complete assessments and attend an intuitive eating workshop. Participants were also informed that the first session would take approximately 1½ hours to complete and would entail receipt of two research credits toward their psychology course grade. They were also notified that the second session would include attending the second intuitive eating workshop, which would last approximately 50 minutes and include receipt of one research credit (see Appendix H for Intervention Group Informed Consent). Lastly, the intervention participants were requested to complete one posttest and

two on-line follow-up assessments. The participants were informed that the posttest and follow-up assessments would take 50 minutes or less to complete and include receipt of one research credit per assessment session toward their psychology course grade.

Intervention group sessions were conducted in groups of 10–12 participants, and the posttest and follow-up assessments were completed on-line using surveymonkey.com.

Participants in the intervention group were granted the opportunity to acquire an additional seven research credits.

#### *Control Group Design*

If the participant was randomly selected for the control group, she was offered to schedule and participate in a total of six data collection sessions (i.e., pretest, midpoint assessment, posttest, and two follow ups) and have the opportunity to earn six research credits toward her psychology course grade by participating in all six sessions (see Appendix I for Control Group Informed Consent). The scheduling of these sessions mirrored those of the intervention group. Control group participants were also notified that each session would include completing questionnaires and take approximately 50 minutes or less to complete. Those randomly selected for the control group completed the first three assessments in groups of 10–20 participants, whereas the final three assessments were completed on-line.

#### *Posttest and Follow-up Assessments: Intervention and Control Groups*

The intervention and control group participants completed the posttest and follow-up assessments on-line using surveymonkey.com. Participants who completed the posttest and final follow-up assessments had the opportunity to register for a drawing worth \$30. The drawings took place at the end of the each final follow-up assessment for a total of three

drawings across three waves of data collection. All winning participants who responded to the drawing results opted for research credit instead of the monetary earnings.

### *Intuitive Eating Intervention*

This intervention was adapted from the intuitive eating program designed by Tribole and Resch (2003). To enhance the fidelity of the program, all intervention workshops were administered by the principal investigator using a structured PowerPoint format.

*Session 1.* This session included a brief introduction to the study, review and signing of an informed consent (see Appendix H), completion of pretest measures (i.e., TAS-20, ESES, GSES, IES, BIQLI, CBDS, and EAT-26), and attending the first intuitive eating workshop. The first workshop introduced the central concepts of intuitive eating and explored the negative biological and psychological consequences of dieting. In addition, participants were familiarized with the benefits and process of becoming an intuitive eater. To foster internalization and thus improve the effectiveness of the intervention, participants were provided instruction on how to complete the Hunger Discovery scale (Tribole & Resch, 2003) and encouraged to practice this procedure in the workshop. For homework, participants were asked to fill out the Hunger Discovery scale at least a couple of times a day throughout the duration of the study and share their reactions to the homework with other participants at the second and third intervention workshops. As the participants attend to the workshop presentation, intermittent questions were posed to them to increase the depth of cognitive processing of the program content. For example, participants were asked to “recall a time when you restricted your eating and to write down what happened with your eating after restricting” and “What were your feelings after giving in and eating the food you were

trying to not eat?” At the end of first workshop, participants were given a debriefing form (see Appendix J) and granted two research credits.

*Session 2.* After participants were welcomed to the second workshop, they were asked to verbally share their experiences and reactions to completing the Hunger Discovery scale (Tribole & Resch, 2003). Following this brief discussion, participants were familiarized with the idea of giving oneself unconditional permission to eat any type of food and how to challenge the distorted thinking of the food police. In addition, there was instruction provided on how to practice feeling your fullness while eating. Lastly, learning how to differentiate between biological hunger and emotional eating was explored. For homework, participants were asked to complete the Fullness Discovery scale (Tribole & Resch, 2003) at least a couple of times a day and bring their reactions to the third session. Participants were granted one research credit for this session.

*Session 3.* Similar to the previous workshop session, this session began encouraging participants to share their experiences and reactions to completing the Hunger and Fullness Discovery scales. Next, participants were introduced to the topic of honoring body diversity and challenging cultural pressure for thinness. Influences that foster and maintain body dissatisfaction were included in this portion of the intervention. Following the body acceptance segment, the idea of maintaining regular physical activity based on how it feels to your mind and body as opposed to exercising for weight loss was addressed. In addition, a brief summary of general nutrition guidelines consistent with intuitive eating were presented. As the third session came to a close, the final segment emphasized the importance of compassionately gauging one’s success with implementing intuitive eating. Most importantly, it was conveyed that there were no failures associated with becoming an

intuitive eater, only opportunities for learning along the way. Participants were asked to briefly write their reactions to what they had learned and wanted to continue applying as a result of participating in the intuitive eating workshops. At the close of the workshop, participants were given a debriefing form and reminded of the upcoming on-line posttest and follow-up assessments. Participants were granted one research credit for attending this workshop session.

During the on-line posttest and follow-up assessments, intervention participants completed the IES, BIQLI, CBDS, and the EAT-26. After completing each on-line assessment, they were provided a debriefing form and granted one research credit per follow-up session.

#### *Control Group*

Participants randomly selected for the control group completed a pretest and two assessment only sessions as well as the on-line posttest and two follow-up assessments. At each assessment, the control group participants completed the following measures: the IES, BIQLI, CBDS, and EAT-26. Participants also reviewed and signed an informed consent at the pretest (see Appendix I) and were provided a debriefing form at each session (see Appendix J).

## CHAPTER FOUR: RESULTS

### *Descriptive Statistics*

Means and standard deviations for all the observed variables are reported along with the zero-order correlations at pretest in Table 1. Internal consistency coefficients for all variables across each assessment point are summarized in Table 2. Prior to conducting the analyses for this study, data were examined to determine whether the variables' distributions were consistent with the normality assumption required of the planned statistical tests. All measured variables (the covariate, i.e., general self-efficacy; two moderators, i.e., emotional awareness and eating self-efficacy; and four dependent variables, i.e., intuitive eating, body image effects, dieting, and disordered eating attitudes) across four time points were examined for their skew and kurtosis values. The statistics for skew ranged from -0.81 to 0.27 ( $Z_s = -2.86$  to  $0.93$ , all  $ps > .001$ ), and the statistics for kurtosis ranged from -1.02 to 2.06 ( $Z_s = -1.82$  to  $3.66$ , all  $ps > .001$ ), with one exception. The only one exception was the body image effects variable at the 1-week follow up (i.e., the statistic for kurtosis was 2.06;  $Z = 3.66$ ,  $p < .001$ ). Therefore, in general, most of the measured variables across four time points were normally distributed.

### *Preintervention Differences*

A series of independent samples  $t$  tests<sup>1</sup> were performed to determine whether there were any significant differences in the main variables between the intervention and control groups at pretest. These variables included the covariate (i.e., general self-efficacy), two moderators (i.e., emotional awareness and eating self-efficacy), and four dependent variables (i.e., intuitive eating, body image effects, dieting, and disordered eating attitudes). No

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<sup>1</sup> Tests were conducted using the imputed data set also used for the study's main analyses.



Table 1.

*Zero-Order Correlations Among Variables over Time*

	1	2	3	4	5	6	7	8	9	10
1.GSE	—									
Moderators										
2.ESE	<b>.47</b>	—								
3.TAS	<b>.46</b>	<b>.46</b>	—							
Pretest										
4.Pre-IES	.10	<b>.37</b>	<b>.22</b>	—						
5.Pre-EAT	<b>.37</b>	<b>.63</b>	<b>.39</b>	<b>.67</b>	—					
6.Pre-BI	<b>.39</b>	<b>.39</b>	<b>.39</b>	<b>.45</b>	<b>.50</b>	—				
7.Pre-CBD	.20	<b>.35</b>	<b>.30</b>	<b>.86</b>	<b>.68</b>	<b>.42</b>	—			
Posttest										
8.IES	.82	<b>.30</b>	.17	<b>.81</b>	<b>.57</b>	<b>.35</b>	<b>.72</b>	—		
9.EAT	<b>.32</b>	<b>.47</b>	<b>.24</b>	<b>.54</b>	<b>.63</b>	<b>.39</b>	<b>.54</b>	<b>.75</b>	—	
10.BI	<b>.47</b>	<b>.29</b>	<b>.32</b>	<b>.35</b>	<b>.39</b>	<b>.76</b>	<b>.36</b>	<b>.45</b>	<b>.55</b>	—
11.CBD	.13	.19	.17	<b>.73</b>	<b>.51</b>	<b>.36</b>	<b>.80</b>	<b>.84</b>	<b>.72</b>	<b>.43</b>
Fol.-Up 1										
12.IES	.18	<b>.27</b>	.17	<b>.83</b>	<b>.54</b>	<b>.32</b>	<b>.75</b>	<b>.91</b>	<b>.71</b>	<b>.47</b>
13.EAT	<b>.30</b>	<b>.39</b>	.10	<b>.44</b>	<b>.57</b>	<b>.28</b>	<b>.52</b>	<b>.68</b>	<b>.92</b>	<b>.46</b>
14.BI	<b>.45</b>	.20	.16	<b>.35</b>	<b>.36</b>	<b>.54</b>	<b>.43</b>	<b>.39</b>	<b>.55</b>	<b>.84</b>
15.CBD	.13	.14	.08	<b>.61</b>	<b>.34</b>	<b>.30</b>	<b>.69</b>	<b>.72</b>	<b>.54</b>	<b>.30</b>
Fol.-Up 2										
16.IES	.05	<b>.30</b>	.06	<b>.77</b>	<b>.46</b>	<b>.30</b>	<b>.65</b>	<b>.93</b>	<b>.68</b>	<b>.38</b>
17.EAT	<b>.42</b>	.40	.29	<b>.50</b>	<b>.57</b>	<b>.32</b>	<b>.55</b>	<b>.68</b>	<b>.93</b>	<b>.53</b>
18.BI	<b>.53</b>	.29	.25	<b>.27</b>	<b>.38</b>	<b>.68</b>	<b>.35</b>	<b>.39</b>	<b>.58</b>	<b>.88</b>
19.CBD	.12	.15	.10	<b>.66</b>	<b>.38</b>	<b>.32</b>	<b>.71</b>	<b>.78</b>	<b>.62</b>	<b>.42</b>
%No Respond	0	0	0	0	0.2	0.2	0	0.2	0.8	0.3
Mean	81.76	107.26	74.64	116.3	64.58	5.33	46.81	123.84	75.7	8.0
SD	10.37	26.53	10.23	18.24	11.06	21.89	12.74	17.34	13.03	19.08

Table 1 (continued)

	11	12	13	14	15	16	17	18	19
1.GSE									
Moderators									
2.ESE									
3.TAS									
Pretest									
4.Pre-IES									
5.Pre-EAT									
6.Pre-BI									
7.Pre-CBD									
Posttest									
8.IES									
9.EAT									
10.BI									
11.CBD	—								
Fol.-Up 1									
12.IES	<b>.83</b>	—							
13.EAT	<b>.71</b>	<b>.69</b>	—						
14.BI	<b>.46</b>	<b>.56</b>	<b>.54</b>	—					
15.CBD	<b>.85</b>	<b>.67</b>	<b>.56</b>	<b>.26</b>	—				
Fol.-Up 2									
16.IES	<b>.79</b>	<b>.91</b>	<b>.65</b>	<b>.38</b>	<b>.73</b>	—			
17.EAT	<b>.74</b>	<b>.75</b>	<b>.92</b>	<b>.61</b>	<b>.52</b>	<b>.65</b>	—		
18.BI	<b>.43</b>	<b>.45</b>	<b>.53</b>	<b>.89</b>	<b>.27</b>	<b>.45</b>	<b>.59</b>	—	
19.CBD	<b>.90</b>	<b>.77</b>	<b>.63</b>	<b>.44</b>	<b>.90</b>	<b>.78</b>	<b>.63</b>	<b>.36</b>	—
%No Respond	0.1	2.0	2.1	1.9	2.0	6.9	4.4	6.7	6.7
Mean	53.39	123.84	76.59	5.66	53.63	99.84	78.06	7.66	53.24
SD	12.07	19.08	14.65	23.7	11.99	14.15	15.73	20.57	12.25

*Note.*  $N = 71$ . GSE = General Self-Efficacy scale; ESE = Eating Self-Efficacy scale; TAS = Toronto Alexithymia scale; IES = Intuitive Eating scale; EAT = Eating Attitudes Test; BI = Body Image Quality of Life scale; CBD = Cognitive Behavioral Dieting scale; Fol.-Up 1 = 1<sup>st</sup> follow up session, Fol.-Up 2 = 2<sup>nd</sup> follow-up session. % No Respond = Percentage of missing data not due to attrition. *SD* = Standard Deviation. Numbers in bold represent significant correlations at  $p < .05$ .

Table 2.

*Internal Consistency Estimates for All Variables*

Variables	$\alpha$	$\alpha$ 95% Confidence Interval
Pretest ( $n = 68$ )		
GSE	.84	[.78, .89]
ESE	.96	[.94, .97]
TAS	.83	[.77, .89]
IES	.87	[.82, .91]
EAT	.92	[.88, .94]
BI	.96	[.94, .97]
CBD	.94	[.91, .96]
Posttest ( $n = 63$ )		
IES	.92	[.89, .96]
EAT	.91	[.87, .94]
BI	.97	[.95, .98]
CBD	.94	[.92, .96]
1-Week Follow-up ( $n = 59$ )		
IES	.93	[.90, .95]
EAT	.92	[.88, .94]
BI	.98	[.97, .99]
CBD	.93	[.90, .96]
2-Week Follow-up ( $n = 57$ )		
IES	.94	[.91, .96]
EAT	.92	[.87, .95]
BI	.98	[.97, .98]
CBD	.94	[.92, .96]

*Note.* GSE = General Self-Efficacy scale; ESE = Eating Self-Efficacy scale; TAS = Toronto Alexithymia scale; IES = Intuitive Eating scale; EAT = Eating Attitudes Test; BI = Body Image Quality of Life scale; CBD = Cognitive Behavioral Dieting scale.

significant differences were found,  $t(69)s = .69, .97, .08, .72, .93, .56,$  and  $.54, ps$  range = .08 to .97). Thus, the groups were approximately equivalent at the beginning of the study on the key measured variables. This suggests that the random assignment of participants into the intervention and control groups was successful.

A series of chi-square tests (for the categorical variables: ethnicity, year in school, and relationship status) and an independent samples  $t$  test (for the continuous variable, age) were conducted to determine whether there were any significant differences between the intervention and control groups on any of the demographic variables at pretest. No significant pretest differences in demographic characteristics between the intervention and control groups were found,  $\chi^2(4, 71) = 3.81, p = .43$  for ethnicity,  $\chi^2(2, 71) = 0.41, p = .82$  for relationship status,  $\chi^2(5, 71) = 3.08, p = .69$  for year in school, and  $t(68) = 0.51, p = .61$  for age.

Moreover, independent samples  $t$  tests were conducted to determine if there were any significant differences on the seven main variables at the pretest between the two different survey orders. Applying the appropriate Bonferroni adjustment (i.e.,  $\alpha = .05/7 = .007$ ), no significant differences were found among the following variables: general self-efficacy,  $t(69) = 1.38, p = .17$ ; emotional awareness,  $t(69) = 1.79, p = .08$ ; eating self-efficacy,  $t(69) = 2.24, p = .03$ ; intuitive eating,  $t(69) = 0.45, p = .66$ ; dieting,  $t(69) = 0.52, p = .61$ ; body image effects,  $t(69) = 2.01, p = .04$ ; and disordered eating attitudes,  $t(69) = 0.50, p = .62$ . Thus, it was deemed there were no confounding effects with regard to the order of the measures.

#### *Missing Data and Attrition Analysis*

Based on best practices for missing data reporting in longitudinal studies, the percentages of missing data not due to attrition for each of the main study variables was

examined for potential bias (Schlomer, Bauman, & Card, 2010). Missing data ranged from 0.1% for the posttest dieting items to 6.9% for the 2-week follow-up dieting items (see Table 1 for missing data percentages). Less than 10% missing data on each measure at each time point suggested that statistical analyses would be less likely to be compromised due to nonrandom measurement or participant-related factors (Bennett, 2001).

As is often the case in longitudinal designs, participant attrition led to a loss of data. Sixty-eight participants (100%; 35 intervention, 33 control) completed the pretest, 63 were available at posttest (89%; 32 intervention, 31 control), 59 completed the 1-week follow up (83%; 30 intervention, 29 control), and 57 completed the final 2-week follow up (80%; 28 intervention, 29 control). The examination of whether the attrition effects were a function of different demographic variables was assessed through chi-square tests (for the categorical variables: ethnicity, year in school, and relationship status) and an analysis of variance (ANOVA) test (for the continuous variable, age). There were eight patterns of missingness: (a) missing at pretest, (b) missing at posttest, (c) missing at the 1-week follow up, (d) missing at the 2-week follow up, (e) missing at the posttest and 1-week follow up, (f) missing at posttest and both follow ups, (g) missing at both follow ups, and (h) missing at pretest and final follow up. A missing value indicator was created that represented each of these patterns, and the following tests were run to assess whether the missingness was at random. On the demographic variables, there were no differences among the patterns for year in school,  $\chi^2(1, 40) = 53.95, p = .07$ ; relationship status,  $\chi^2(1, 16) = 12.29, p = .72$ ; and age,  $F(8, 61) = .88, \eta_p^2 = .10, p = .54$ . There were significant differences found for ethnicity however,  $\chi^2(1, 32) = 102.44, p = .000$ ). Specifically, there were significantly more Euro-American participants who did not complete the posttest and follow-up assessments ( $n = 5$ ), compared to the other

ethnic groups represented ( $n = 0$ ). This was not surprising given the study sample comprised 91.7% Euro-American students.

A series of ANOVA tests were also run to assess the patterns of missingness among the dependent variables. There were no statistically significant differences between the attrition patterns described above on any of the study variables ( $\eta_p^2$  range = .03 to .18,  $ps$  range = .12 to .98). Thus, the missing data were unlikely related to the main study variables and were random in nature. This increases the chances of obtaining unbiased results when using imputation approaches to handling missing data.

Complete case analysis (i.e., removing participants with missing data) is a common solution to dealing with missing data (Little & Rubin, 2002). When examining multiple time points simultaneously in mixed ANOVA models, complete-case analysis is not ideal because available data would be ignored and, as a result, would reduce statistical power. Thus, missing data for the total scores was addressed with multiple imputation (Little & Rubin) that is enabled by the Amelia package in *R* (version 2.8.1). This procedure uses information from available data to impute (or estimate) plausible values for the missing data. Three different imputed data sets were created that vary due to uncertainty in the estimates of the missing data. All analyses were run on all three data sets with comparable patterns of results between them. Thus, the results from only one randomly-selected imputed data set are presented here. All analyses were also run with complete cases only (i.e., removing participants with any missing data) and the results were comparable to those with the imputed data sets. Though there were comparable patterns of results between the original dataset and the randomly selected imputed data set, in order to increase power the imputed data set was used for the following analyses.

### *Effect Size*

In addition to examining the equivalence of the sample, it is important that this study attends to the issue of statistical significance and effect size reporting. Statistical significance has historically been determined by  $p$  values, with Bonferroni corrections applied inconsistently across studies. Nakagawa (2004) argued that the use of Bonferroni adjustments limits the reporting of nonsignificant findings that may otherwise be informative to the field. As an alternative, others have suggested replacing the practice of Bonferroni corrections with the reporting of effect sizes when conducting multiple comparisons (B. Thompson, 2002). Currently, it is a required practice in most psychology journals to report effect sizes. Although effect size reporting is an important step toward establishing consistency in how statistical and practical significance is determined, often overlooked is how the sampling error of these estimates may inflate empirical conclusions. In response to this concern, researchers advocate reporting effect size confidence intervals to generate more accurate conclusions about the magnitude of observed findings (e.g., Bonett, 2008). Based on the above suggestions, for the current study effect size (e.g., Cohen's  $d$  and partial eta-squared,  $\eta_p^2$ ) and confidence intervals for Cohen's  $d$  and regression coefficients,  $B$ ) will be reported. Based on Cohen (1973),  $\eta_p^2$  was reported instead of eta-squared because  $\eta_p^2$  allows for more meaningful comparisons across studies when control variables are included in the design.

### *Analytic Approach and Statistical Assumptions*

Mixed ANOVA models were used to address the primary research questions. Mixed ANOVA models are used when there are both between-subjects and within-subjects factors in an experimental design. The between-subjects factor is whether a participant is in the control or intervention group, and the within-subjects factor are the measurements of the four

dependent variables across the four time points of interest (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). Based on recommendations in Green, Salkind, and Akey (2000), a multivariate approach was used to analyze the repeated measures effects in the ANOVA models as this method does not assume equal variances and equal covariances. When significant interactions were found, follow-up independent samples *t* tests or analysis of covariance (ANCOVA) tests were conducted to examine the simple main effects. All analyses were conducted in SPSS version 18.0.

### *Hypothesis Testing*

The purpose of the first set of hypotheses was to evaluate the effectiveness of the intuitive eating intervention on each of the four dependent variables (i.e., intuitive eating, body image effects, dieting, and disordered eating attitudes) over time (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). The effectiveness of the intervention was evidenced when there was a significant interaction effect (i.e., Time x Condition).

### *Intuitive Eating*

The overall multivariate test indicated the interaction effect (Time x Condition) was significant, Pillai's Trace  $F(3, 67) = 5.89, p = .001, \eta_p^2 = .21$ . Moreover, there were significant results for the linear,  $F(1, 69) = 16.54, p < .001, \eta_p^2 = .19$ , and quadratic effects,  $F(1, 69) = 9.41, p = .003, \eta_p^2 = .12$ , but not for the cubic effect,  $F(1, 69) = 0.17, p = .69, \eta_p^2 = .002$ . In order to understand the source of these interactions, four independent *t* tests were conducted to examine the simple main effects between the intervention and control groups over time (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). As seen in Table 3, the *t* test results indicated that the intervention and control groups did not significantly



Table 3.

*Results for Intuitive Eating*

Time	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect size 95% CI
Pretest	Intervention	65.46	10.86	0.72	.48	.19	[-0.29, 0.66]
	Control	63.57	11.38				
Posttest	Intervention	80.25	10.84	3.38**	.001	.80	[ 0.30, 1.30]
	Control	70.46	13.52				
1-week follow-up	Intervention	82.56	11.92	4.08***	.000	.96	[0.50, 1.46]
	Control	69.72	14.62				
2-week follow-up	Intervention	84.06	12.67	3.75***	.000	.89	[0.38, 1.39]
	Control	71.16	16.25				

*Note.* Intervention group ( $n = 38$ ); control group ( $n = 33$ ).

\*\* $p < .01$ . \*\*\* $p < .001$ .

differ at pretest and the effect size was small. However, these two groups' scores were significantly different at posttest, 1-week follow up, and 2-week follow up, with small to large effect sizes indicated.

Figure 1 depicts that the pretest intuitive eating scores were not significantly different between the intervention and control groups. However, after intervention, the intuitive eating mean score in the intervention group was significantly higher than that of the control group at the posttest assessment, a significant difference that was maintained at 1-week and 2-week follow ups. In sum, these results show that the intervention did have an initial and lasting effect on intuitive eating scores and are consistent with the qualitative data collected from participants at the second and third intervention session (see Tables 4 and 5 for summary).

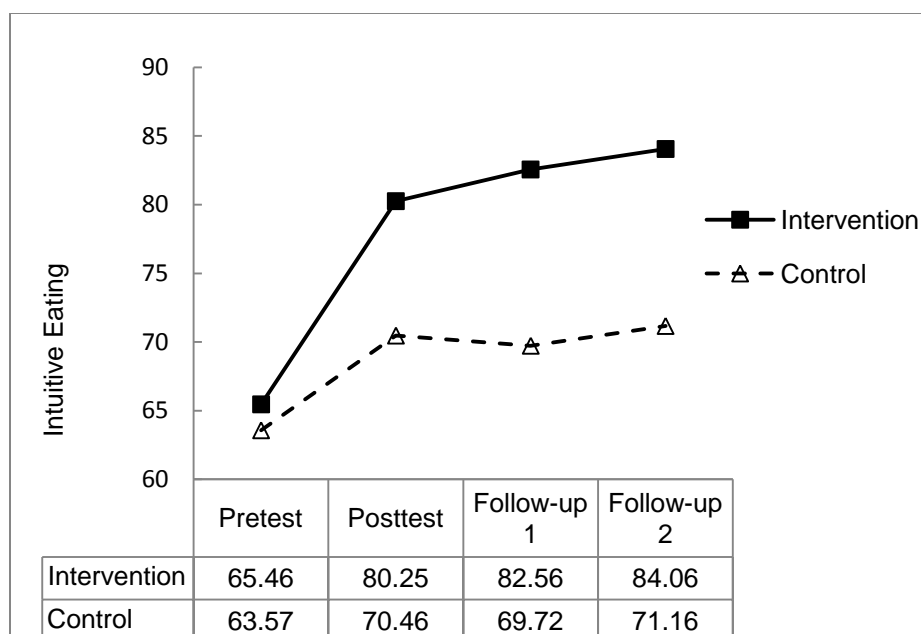


Figure 1. Intuitive eating mean scores over time.

Table 4.

*Summary of Intervention Participant Responses Regarding What Was Learned at Sessions 1-3*

Question	Quoted responses
I learned...	<p>1a. ...to pay more attention to when my body tells me to eat or stop eating.</p> <p>2a. ...intuitive eating is eating in a healthy way for your body that doesn't restrict "bad" foods.</p> <p>3a. ...diets can lead to eating disorders by restricting particular foods you increase food obsessions and can later lose control and binge.</p> <p>4a. ...you aren't supposed to eat just when you're starving, but when you're moderately hungry. I thought a lot more when I was hungry. How hungry am I? What am I hungry for? Why am I hungry?</p> <p>5a. ...that you are much more likely to overeat when you are very hungry.</p> <p>6a. ...that I'm already kind of an intuitive eater because I tend to eat what I crave and when I am hungry.</p> <p>7a. ...that my body will tell me when I need to eat and it is okay to eat what I want because there is probably a biological reason why I want a particular food.</p>

Table 4. (continued)

Question	Quoted responses
8a.	...that checking food labels and calories is a way of dieting even though I tell myself I'm looking at the nutrients; that's just an excuse for me.
9.	...that I sometimes wait too long to eat and then my head hurts.
10a.	...that my hunger signals are that I get irritable and really bad headaches when I skip meals.
11a.	...dieting and food deprivation is bad for your body; it causes weight swings and slow metabolism.
12a.	...about yo-yo dieting and how it's not effective
13a.	...that I get full a lot sooner than I previously thought. Before I used to think I needed to eat all that was in front of me.
14a.	...my barriers to recognizing fullness are distractions like people/homework.
15a.	...that I eat when stressed so I'm trying to stop that habit.
16a.	...that using food to cope with emotions makes it harder for your body to discern between the feeling and being hungry.
17a.	...that I sometimes eat when I'm tired and bored.
18a.	...that I should take actions directly toward my emotions instead of using food.
19a.	...that listening to my intuitive eater can help me safely be the body size nature intended.
20a.	... that I should feel good about my body shape because we're all different in our body types.
21a.	...about changing my negative body image thoughts into ideas that are more positive and will help my confidence.
22a.	...that it's good to exercise but to do it because it feels good and listen to your body when it needs rest.

Table 5.

*Summary of Intervention Participant Responses Regarding Future Outcomes*

Question	Quoted responses
I want to continue...	<p>1b. ...applying intuitive eating in my life because I noticed that over the past few weeks I felt much better about myself.</p> <p>2b. ...most of what has been mentioned is stuff I was aware of and have already been implementing. I find the acknowledgement of this encouraging and plan to continue using it.</p> <p>3b. ...paying attention to my body telling me to eat and when to stop eating.</p> <p>4b. ...applying intuitive eating into my life by not categorizing and getting off course as a failure.</p> <p>5b. ...to look at the actual problem and see if I'm really hungry or if the problem needs to be looked at [nonemotional eating].</p> <p>6b. ...knowing it's okay to snack.</p> <p>7b. ...trying to discover my fullness and to get better at it.</p> <p>8b. ...not eating when I'm full even if there's food left on the plate which is hard for me.</p> <p>9b. ...cutting back on eating when I'm stressed, but not hungry.</p> <p>10b ...trying not to worry so much about what I eat and comparing myself to others.</p> <p>11b ...[my plan] to begin exercising and embracing myself more positively, and monitoring my fullness/hunger to achieve a healthy body size/image.</p>

### *Dieting*

The overall multivariate test indicated that the interaction effect (Time x Condition) was significant, Pillai's Trace  $F(3, 67) = 4.76, p = .005, \eta_p^2 = .18$ . There was also a significant linear effect,  $F(1, 69) = 4.93, p = .03, \eta_p^2 = .07$ , and cubic effect,  $F(1, 69) = 8.20, p = .006, \eta_p^2 = .11$ , but a nonsignificant quadratic effect,  $F(1, 69) = 3.15, p = .08, \eta_p^2 = .05$ . Therefore, four independent *t* tests were calculated to examine the nature of the interaction (i.e., simple main effects) over time (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). As seen in Table 6, the mean scores for dieting were not significantly different between intervention group and control group at pretest, with a small effect size noted. However, the groups' mean scores were significantly different at posttest and at the 2-week follow up. These differences yielded small to large effect sizes.

Table 6.

#### *Results for Dieting*

Time	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect size 95% CI
Pretest	Intervention	47.57	12.41	.54	.59	.13	[-0.35, 0.60]
	Control	45.94	13.25				
Posttest	Intervention	56.96	10.98	2.80**	.007	.66	[0.18, 1.15]
	Control	49.28	12.12				
1-week follow-up	Intervention	56.16	11.78	1.95	.06	.46	[-0.01, 0.94]
	Control	50.71	11.73				
2-week follow-up	Intervention	56.81	11.32	2.76**	.007	.65	[0.17, 1.14]
	Control	49.13	12.16				

*Note.* Intervention group ( $n = 38$ ); control group ( $n = 33$ ). Higher dieting scores indicate less dieting thoughts and behaviors.

\*\* $p < .01$ .

The interaction effects on dieting are plotted in Figure 2, illustrating that, after the pretest, the intervention group posttest and 2-week follow-up mean scores were significantly higher than were those of the control group. Though the differences between the two groups' mean scores at the 1-week follow up were not significant, there was a trend to maintain the intervention effects at the 1-week follow up. Overall, these results suggest that the intervention did appear to have an initial and lasting effect on dieting scores.

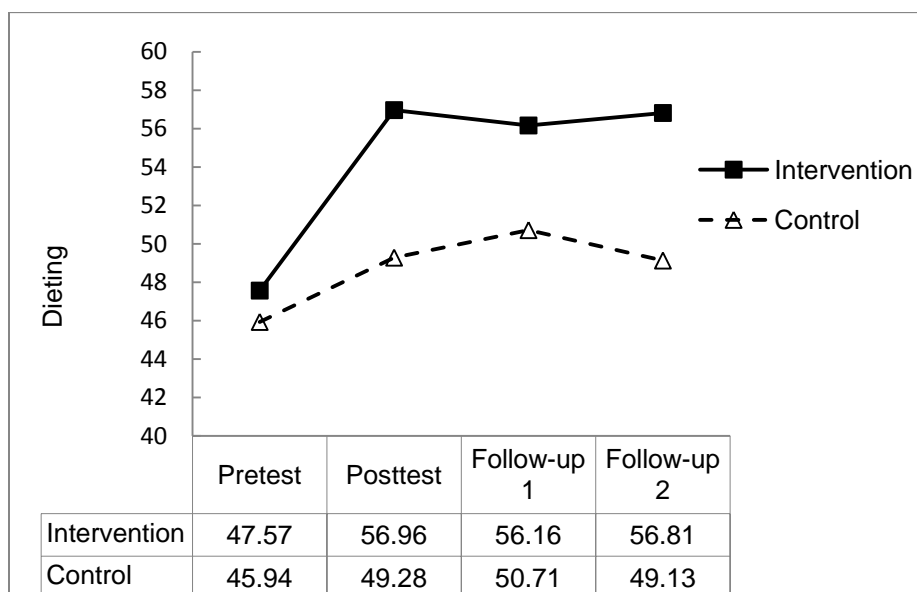


Figure 2. Dieting mean scores over time.

### Body Image Effects

The overall multivariate test indicated that the interaction effect (Time x Condition) was not significant, Pillai's Trace  $F(3, 67) = .77, p = .52, \eta p^2 = .03$ . Moreover, there were no significant results for the linear effect,  $F(1, 69) = 1.09, p = .30, \eta p^2 = .02$ ; quadratic effect,  $F(1, 69) = 0.26, p = .61, \eta p^2 = .004$ ; or cubic effect,  $F(1, 69) = 1.80, p = .18, \eta p^2 = .03$ . As seen in Table 7, there were no significant mean score differences at pretest, posttest, 1-week

Table 7.  
*Results for Body Image Effects*

Time	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect size 95% CI
Pretest	Intervention	6.69	23.34	.56	.58	.13	[-0.34, 0.60]
	Control	3.77	20.34				
Posttest	Intervention	9.64	17.17	.80	.43	.19	[-0.29, 0.67]
	Control	6.01	21.18				
1-week follow-up	Intervention	9.47	17.93	1.47	.15	.34	[-0.14, 0.83]
	Control	1.27	28.55				
2-week follow-up	Intervention	10.59	18.25	1.29	.20	.30	[-0.18, 0.78]
	Control	4.30	22.78				

*Note.* Intervention group ( $n = 38$ ); control group ( $n = 33$ ).

follow up, and 2-week follow up. Based on significance testing, these results indicate that the intervention did not appear to have a notable impact on participants' perceptions of how their body image affects their lives.

#### *Disordered Eating Attitudes*

The overall multivariate test indicated that the interaction effect (Time x Condition) was not significant, Pillai's Trace  $F(3, 67) = 2.37, p = .08, \eta_p^2 = .94$ . However, there was a significant quadratic effect on the time and condition interaction,  $F(1, 69) = 4.30, p = .04, \eta_p^2 = .06$ . Therefore, as described above, four independent samples  $t$  tests were used to examine the simple main effects over time (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). As seen in Table 8, the mean disordered eating attitudes scores were not significantly different between the intervention and control groups at pretest and posttest. However, the scores on these two groups were significantly different at 1-week follow up and 2-week

Table 8.

*Results for Disordered Eating Attitudes*

Time	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect size 95% CI
Pretest	Intervention	118.19	17.27	.93	.36	.22	[-0.26, 0.70]
	Control	114.14	19.32				
Posttest	Intervention	126.92	16.07	1.75	.09	.41	[-0.07, 0.90]
	Control	119.80	18.21				
1-week follow-up	Intervention	128.67	16.91	2.36*	.02	.56	[0.07, 1.04]
	Control	118.28	20.15				
2-week follow-up	Intervention	103.25	12.67	2.24*	.03	.53	[0.04, 1.01]
	Control	95.91	15.00				

*Note.* Intervention group ( $n = 38$ ); control group ( $n = 33$ ). Higher disordered eating attitude scores indicate healthier eating attitudes.

\* $p < .05$ .

follow up. Effect sizes for the two follow-up assessments suggest the effects could range from small to large.

Illustrated in Figure 3, the pretest mean disordered eating attitude scores were not significantly different between the intervention and control groups. At posttest, the disordered eating attitudes mean score (i.e., healthier eating attitudes) in the intervention group was higher than that of the control group but did not reach a significant level. However, at the 1-week follow up, the mean difference was significantly higher for the intervention group than for the control group. Then, at the 2-week follow up, the disordered eating attitude mean score dropped for both groups, though it remained significantly higher for the intervention group.



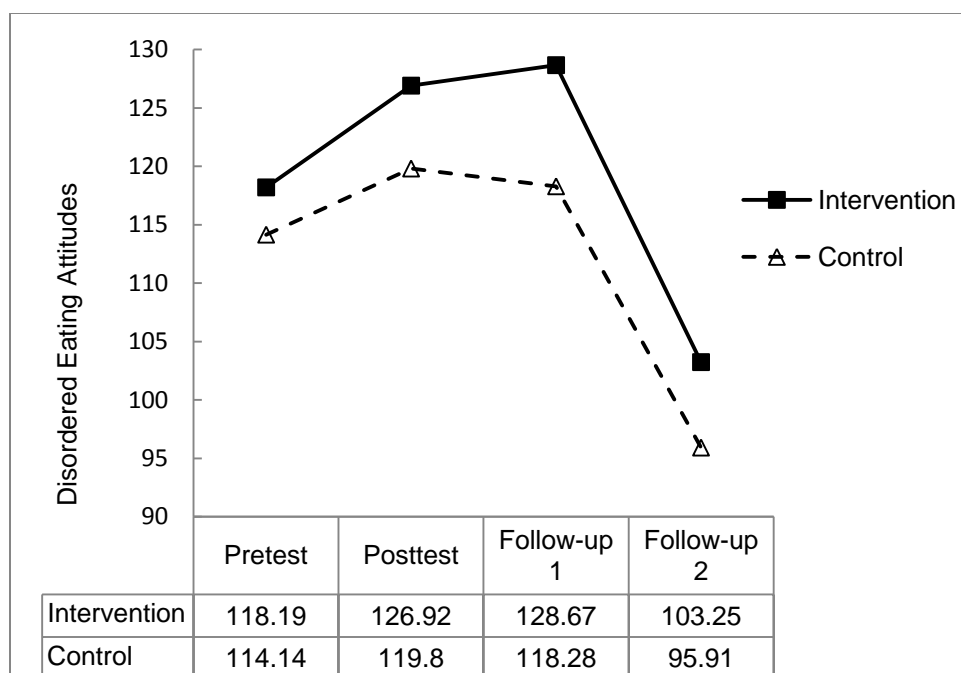


Figure 3. Disordered eating attitude mean scores over time

#### *Emotional Awareness as a Moderator of Intervention Effects*

The second set of hypotheses examined the moderating effects of emotional awareness on the effects of the intervention for the four dependent variables across all four time points (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). Repeated-measures ANOVA tests were used to test whether there were differential changes in each of the outcome measures between the higher vs. lower emotional awareness groups (i.e., a median split of the intervention group's emotional awareness scores). Scores ranged from 51 to 75 for the lower emotional awareness group, whereas the higher group scores ranged from 76 to 93. It was predicted that participants with higher emotional awareness scores ( $n = 19$ ) would demonstrate significantly better outcomes relative to those with lower emotional awareness scores ( $n = 19$ ) at posttest and both follow ups.

### *Intuitive Eating*

The overall multivariate tests revealed a significant moderating effect of emotional awareness on intuitive eating scores, Pillai's Trace  $F(3,34) = 4.92, p = .006, \eta_p^2 = .30$ . There was also a significant quadratic effect on the time and emotional awareness interaction,  $F(1, 36) = 5.16, p = .03, \eta_p^2 = .13$ . Follow-up independent samples  $t$  tests were used to examine the simple main effects for the two emotional awareness groups in order to understand the nature of this interaction (i.e., moderating effect). No significant simple main effects were found (see Table 9). As illustrated in Figure 4, these results suggest that the lower emotional awareness group showed an increasing trend that leveled off at later time points. In contrast, the higher emotional awareness group showed an increasing trend, then a flattening off at follow-up 1, and then another rise at the 2-week follow up. As seen in Table 9, the difference between the high vs. low emotional awareness groups was approaching significance at the 2-

Table 9.

#### *Results for High and Low Emotional Awareness on Intuitive Eating*

Time	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect size 95% CI
Pretest	High emotional awareness	68.35	10.09	1.65	.10	.54	[-0.12, 1.21]
	Low emotional awareness	62.58	11.09				
Posttest	High emotional awareness	81.92	11.98	.95	.35	.31	[-0.35, 0.97]
	Low emotional awareness	78.57	9.60				
1-week follow-up	High emotional awareness	82.99	13.26	.22	.83	.07	[-0.58, 0.73]
	Low emotional awareness	82.13	10.77				
2-week follow-up	High emotional awareness	87.60	13.60	1.78	.08	.58	[-0.09, 1.24]
	Low emotional awareness	80.51	10.88				

*Note.* High emotional awareness group ( $n = 19$ ); low emotional awareness group ( $n = 19$ ).

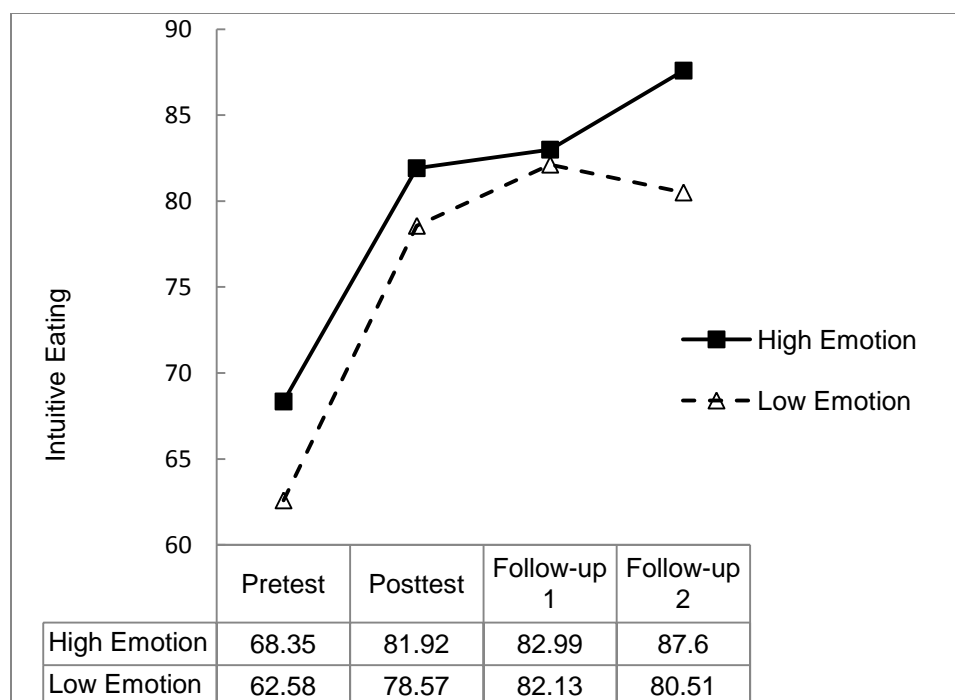


Figure 4. *Intuitive eating mean scores over time.*

week follow up. Based on the magnitudes of the effect sizes, the results are inconclusive because the effects could be large or as small as zero across all time points.

### *Dieting*

The overall multivariate test for a time and emotional awareness interaction on dieting scores was not significant,  $F(3, 34) = 1.96, p = .13, \eta_p^2 = .15$ . However, there was a significant linear effect of time and emotional awareness,  $F(1, 36) = 5.89, p = .02, \eta_p^2 = .14$ . Thus, four independent samples  $t$  tests were used to examine the simple main effects over time (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). As seen in Table 10 and illustrated in Figure 5, the lower emotional awareness group had a significantly lower pretest dieting mean score relative to the higher emotional awareness group. However, after intervention, their dieting scores were as good as those with higher emotional awareness.

Table 10.

*Results for High and Low Emotional Awareness on Dieting*

Time	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect size 95% CI
Pretest	High emotional awareness	52.36	11.01	2.55*	.02	.83	[0.15, 1.51]
	Low emotional awareness	42.78	12.13				
Posttest	High emotional awareness	59.65	10.32	1.54	.13	.50	[-0.16, 1.16]
	Low emotional awareness	54.27	11.23				
1-week follow-up	High emotional awareness	56.86	12.34	0.37	.72	.12	[-0.54, 0.77]
	Low emotional awareness	55.45	11.49				
2-week follow-up	High emotional awareness	57.94	12.27	0.61	.54	.20	[-0.46, 0.85]
	Low emotional awareness	55.68	10.48				

*Note.* High emotional awareness group ( $n = 19$ ); low emotional awareness group ( $n = 19$ ). Higher dieting scores indicate less dieting thoughts and behaviors.

\* $p < .05$ .

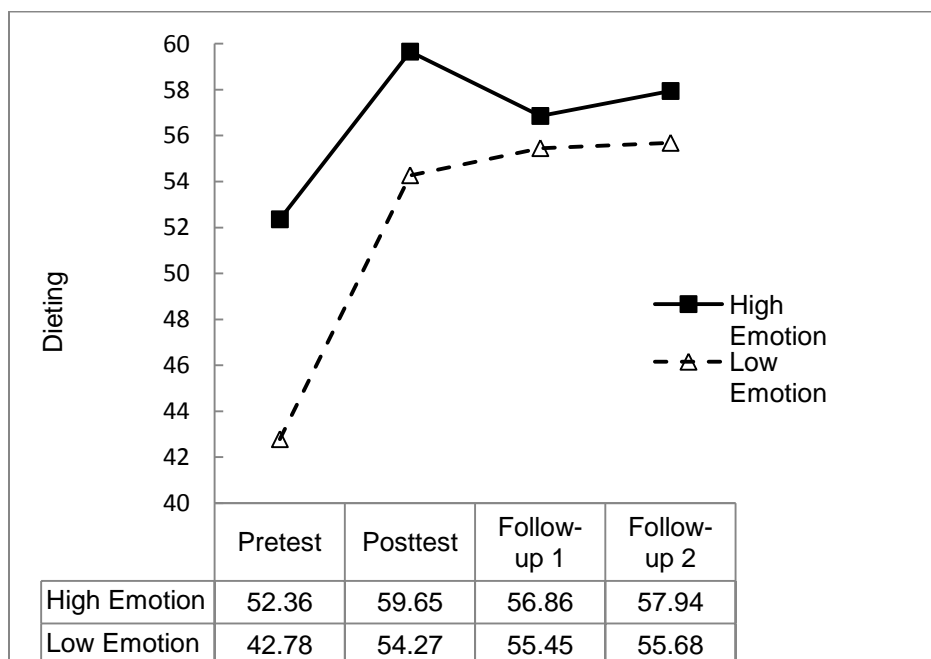


Figure 5. *Dieting mean scores over time.*

These results might imply that the intervention helped both those with lower and higher emotional awareness to modify their dieting practices in a positive direction. It is notable that the effect was maintained at 1-week and 2-week follow ups after intervention. The differences at posttest, 1-week follow up, and 2-week follow up are inconclusive because the effect sizes could be large or as small as zero.

### *Body Image Effects*

Multivariate tests showed no significant interactions between time and emotional awareness on body image effects scores,  $F(3, 34) = 1.06, p = .38, \eta_p^2 = .09$ . Also, there were no significant linear, quadratic, or cubic effects for the interaction of time and emotional awareness. However, there was significant main effect,  $F(1, 36) = 6.71, p = .014, \eta_p^2 = .16$ . This indicated that, averaging across the time points, scores on body image effects were higher for those with higher scores on emotional awareness than for those with a lower score on emotional awareness.

### *Disordered Eating Attitudes*

The overall multivariate tests indicated a significant moderating effect of emotional awareness on disordered eating attitude scores, Pillai's Trace  $F(3,34) = 2.98, p = .045, \eta_p^2 = .21$ . There was also a significant linear effect on the time and emotional awareness,  $F(1, 36) = 7.77, p = .01, \eta_p^2 = .18$ . Follow-up independent samples  $t$  tests were conducted to examine simple main effects for the two emotional awareness groups in order to explore the nature of this interaction (i.e., moderating effect). As seen in Table 11 and illustrated in Figure 6, the lower emotional awareness group had a significantly lower pretest disordered eating attitudes mean score relative to the higher emotional awareness group. However, there was no significant difference between their scores at posttest, 1-week follow up, and 2-week follow

Table 11.

*Results for High and Low Emotional Awareness on Disordered Eating Attitudes*

Time	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect size 95% CI
Pretest	High emotional awareness	124.56	12.23	2.42*	.02	0.78	[0.10, 1.47]
	Low emotional awareness	111.82	19.45				
Posttest	High emotional awareness	129.53	13.02	1.00	.32	0.33	[-0.33, 0.98]
	Low emotional awareness	124.30	18.63				
1-week follow-up	High emotional awareness	132.19	13.88	1.30	.20	0.42	[-0.24, 1.08]
	Low emotional awareness	125.15	19.21				
2-week follow-up	High emotional awareness	104.21	8.90	0.47	.65	0.15	[-0.50, 0.80]
	Low emotional awareness	102.29	15.64				

*Note.* High emotional awareness group ( $n = 19$ ); low emotional awareness group ( $n = 19$ ). Higher disordered eating attitude scores indicate healthier eating attitudes.

\* $p < .05$ .

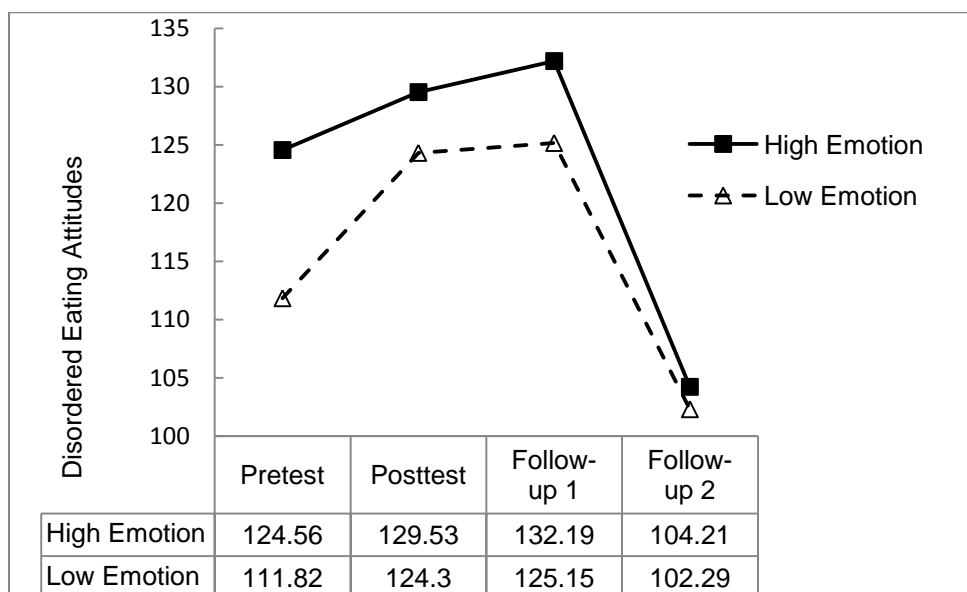


Figure 6. *Disordered eating attitudes mean scores over time.*

up. For both groups (i.e., high and low emotional awareness), there seems to be a trend of increasing scores from pretest to posttest, then a slight increase at the 1-week follow up, but a drop at the 2-week follow up. The differences at posttest, 1-week follow up, and 2-week follow up are inconclusive because the observed effects could be large or as small as zero.

#### *Eating Self-Efficacy as a Moderator of Intervention Effects*

The second set of hypotheses examined eating self-efficacy as a moderator of the intervention effects for the four dependent variables across four time points (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). Scores on the general self-efficacy measure were included in the model to control for general self-efficacy and test for the unique effect of eating self-efficacy. A repeated-measures ANCOVA tests were used to determine whether there were differential changes in each of the outcome measures between high and low eating self-efficacy groups (i.e., a median split of the intervention group's eating self-efficacy scores). Scores ranged from 55 to 103 for the lower eating self-efficacy group, whereas the higher group scores ranged from 110 to 175.

It was predicted that individuals with higher eating self-efficacy scores ( $n = 19$ ) relative to those with lower eating self-efficacy scores ( $n = 16$ ) would demonstrate significantly higher scores on the outcome measures at posttest and follow ups. The data from the control group were not included in these analyses.

#### *Intuitive Eating*

Overall multivariate tests indicated there was a significant moderating effect of eating self-efficacy on intuitive eating scores after controlling for general self-efficacy, Pillai's Trace  $F(3, 30) = 2.86, p = .05, \eta_p^2 = .22$ . In addition, there was a significant linear effect of time and condition,  $F(1, 32) = 6.30, p = .02, \eta_p^2 = .17$ , but not a significant quadratic effect,

$F(1, 32) = 1.05, p = .31, \eta_p^2 = .03$ , or cubic effect,  $F(1, 32) = 0.03, p = .87, \eta_p^2 = .001$ .

Therefore, four univariate ANCOVAs were conducted to examine the nature of the interaction (i.e., simple main effects) over time (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). In Table 12, the results revealed that, at pretest, individuals with lower eating self-efficacy had significantly lower intuitive eating scores compared to those with higher eating self-efficacy. However, after the intervention, the intuitive eating scores were not significantly different between these two groups (i.e., lower and higher eating self-efficacy) at posttest, 1-week follow up, and 2-week follow up.

As seen in Figure 7, at pretest, the lower eating self-efficacy group starts at a significantly lower intuitive eating mean score than do those with higher eating self-efficacy. However, after intervention, their intuitive eating scores are just as good as those with higher eating self-efficacy. These results might imply that the intervention helped both those with

Table 12.

*Simple Main Effects for High and Low Eating Self-Efficacy on Intuitive Eating*

Time	Group	<i>M</i>	<i>SD</i>	<i>B</i>	95% CI for <i>B</i>	<i>F</i>	<i>p</i>	$\eta_p^2$
Pretest	High eating self-efficacy	70.68	10.14	-8.11	[-14.61, -1.61]	6.46*	.02	.171
	Low eating self-efficacy	60.91	8.03					
Posttest	High eating self-efficacy	82.03	11.88	-3.01	[-10.99, 4.98]	0.58	.45	.02
	Low eating self-efficacy	77.68	10.03					
1-week follow-up	High eating self-efficacy	82.84	12.43	0.44	[-8.29, 9.17]	0.01	.92	.000
	Low eating self-efficacy	81.52	11.96					
2-week follow-up	High eating self-efficacy	84.08	13.29	1.14	[-8.00, 10.27]	0.06	.80	.002
	Low eating self-efficacy	82.79	12.72					

*Note.* High eating self-efficacy group ( $n = 19$ ); low eating self-efficacy group ( $n = 16$ ).

\* $p < .05$ .



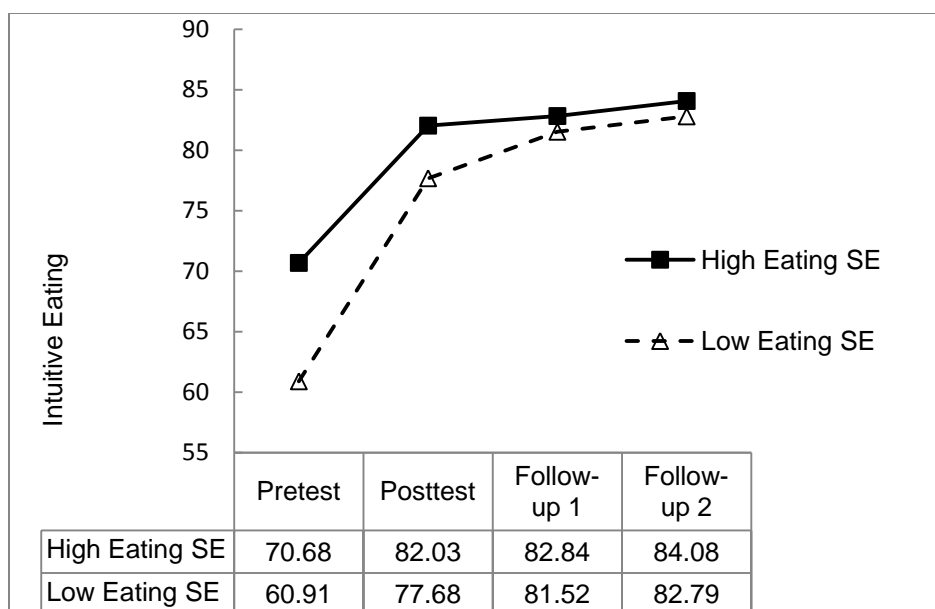


Figure 7. Intuitive eating mean scores over time.

lower and higher eating self-efficacy to improve their intuitive eating. It is notable that the effect was maintained at 1-week and 2-week follow ups after intervention. Post-hoc paired samples *t* test results for pretest to 2-week follow-up effects further supported that the intervention benefitted participants with high and low eating self-efficacy,  $t(20) = 7.61, p = .000$ ;  $t(16) = 6.40, p = .000$ , respectively.

### Dieting

The multivariate tests did not indicate a significant moderating effect of eating self-efficacy on dieting scores after controlling for general self-efficacy, Pillai's Trace  $F(3, 30) = 2.68, p = .07, \eta_p^2 = .21$ . Likewise, there was no linear effect,  $F(1, 32) = 3.23, p = .08, \eta_p^2 = .09$ ; quadratic effect,  $F(1, 32) = 1.41, p = .24, \eta_p^2 = .04$ ; or cubic effect,  $F(1, 32) = 2.88, p = .10, \eta_p^2 = .08$ . The main effect of dieting was not significant as well, indicating that, averaging across time points, there were no significant mean score differences between those

with higher or lower eating self-efficacy,  $F(1, 32) = 0.54, p = .47, \eta_p^2 = .02$ . Thus, the intervention did not seem to benefit one group more or less than the other.

### *Body Image Effects*

The overall multivariate tests showed a significant moderating effect of eating self-efficacy on body image effects scores, after controlling for general self-efficacy, Pillai's Trace  $F(3, 30) = 3.26, p = .04, \eta_p^2 = .25$ . In addition, there was a significant linear effect of time and eating self-efficacy,  $F(1, 32) = 5.83, p = .02, \eta_p^2 = .15$ , and a significant quadratic effect,  $F(1, 32) = 8.88, p = .01, \eta_p^2 = .23$ . Similar to the analyses above, four univariate ANCOVAs were conducted to examine the nature of the interaction over time. The results revealed that, at pretest, those with lower eating self-efficacy had significantly lower body image effects scores compared to those with higher eating self-efficacy. However, after the intervention, the body image effects scores were not significantly different between these two groups (i.e., lower vs. higher eating self-efficacy) at posttest, 1-week follow up, and 2-week follow up (see Table 13).

Consistent with Table 13, Figure 8 illustrates that, although the lower eating self-efficacy group has a lower mean score on body image effects before intervention, their mean score is similar to the mean score of the higher eating self-efficacy group after intervention. These results imply that the intervention may be most effective in improving the body image effects scores for those who are at lower levels of eating self-efficacy. Post-hoc paired samples  $t$  test results for pretest to 2-week follow-up effects further supported that the intervention significantly helped participants with low eating self-efficacy improve their body image effects,  $t(16) = 2.29, p = .04$ , whereas those with high eating self-efficacy showed no significant improvements,  $t(20) = 1.12, p = .27$ .

Table 13.

*Simple Main Effects for High and Low Eating Self-Efficacy on Body Image Effects*

Time	Group	<i>M</i>	<i>SD</i>	<i>B</i>	95% CI for <i>B</i>	<i>F</i>	<i>p</i>	$\eta_p^2$
Pretest	High eating self-efficacy	14.84	19.40	-15.60	[-29.47, -1.72]	5.24*	.03	.14
	Low eating self-efficacy	-2.36	18.60					
Posttest	High eating self-efficacy	10.99	18.14	-2.23	[-14.56, 10.09]	0.14	.71	.004
	Low eating self-efficacy	6.84	15.64					
1-week follow-up	High eating self-efficacy	7.41	18.02	4.30	[-9.12, 17.71]	0.42	.52	.013
	Low eating self-efficacy	10.05	18.92					
2-week follow-up	High eating self-efficacy	11.43	18.86	-0.86	[-13.59, 11.87]	0.02	.89	.001
	Low eating self-efficacy	7.46	17.00					

*Note.* High eating self-efficacy group ( $n = 19$ ); low eating self-efficacy group ( $n = 16$ ).

\* $p < .05$ .

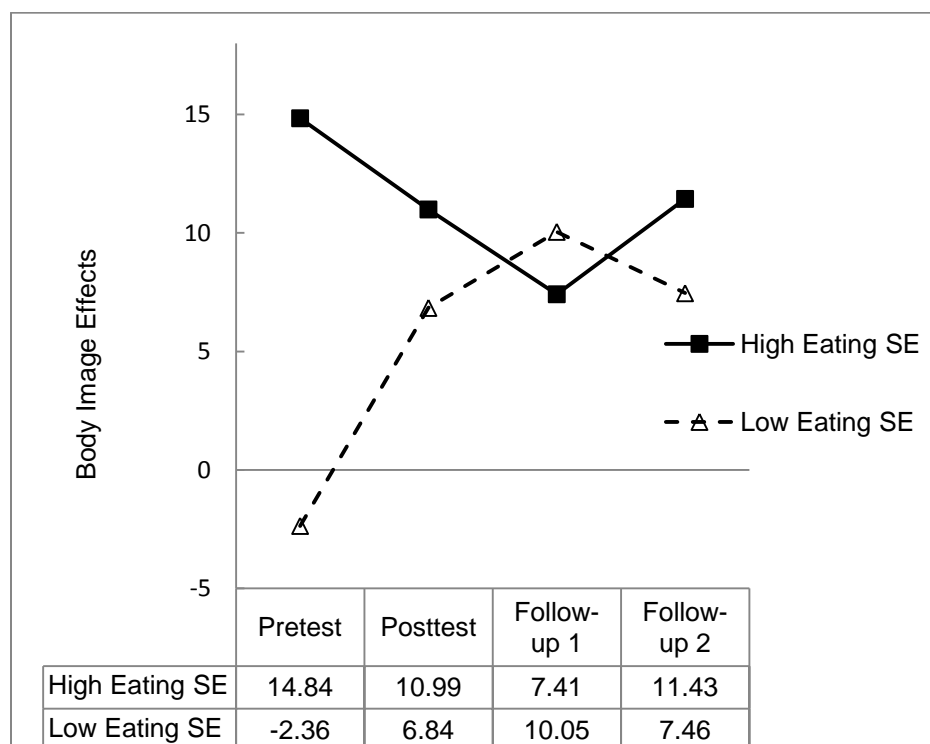


Figure 8. Body image effects mean scores over time

### *Disordered Eating Attitudes*

The multivariate test indicated there was no significant moderating effect for eating self-efficacy on the disordered eating attitudes outcome, Pillai's Trace  $F(3, 30) = 2.05, p = .13, \eta^2 = .17$ . However, there was a significant quadratic effect on the time and eating self-efficacy interaction,  $F(1, 32) = 4.33, p = .05, \eta^2 = .12$ . Therefore, four univariate ANCOVAs were conducted to examine the nature of the interaction (i.e., simple main effects) over time (i.e., pretest, posttest, 1-week follow up, and 2-week follow up). However, as shown in Table 14, no significant simple main effects were found. That is, the disordered eating attitude scores were not significantly different between these two groups (i.e., lower and higher eating self-efficacy) at pretest, posttest, 1-week follow up, and 2-week follow up.

As depicted in Figure 9, for both groups (i.e., high and low eating self-efficacy), there seems to be a trend of increasing disordered eating attitudes scores from pretest to posttest, then another increase at the 1-week follow up, but a drop at the 2-week follow up.

Table 14.

#### *Simple Main Effects for High and Low Eating Self-Efficacy on Disordered Eating Attitudes*

Time	Group	<i>M</i>	<i>SD</i>	<i>B</i>	95% CI for <i>B</i>	<i>F</i>	<i>p</i>	$\eta^2$
Pretest	High eating self-efficacy	120.89	17.49	-4.42	[-17.48, 8.64]	0.80	.50	.02
	Low eating self-efficacy	114.94	18.45					
Posttest	High eating self-efficacy	125.83	15.12	2.52	[-9.81, 14.84]	0.17	.68	.01
	Low eating self-efficacy	127.14	18.74					
1-week follow-up	High eating self-efficacy	126.88	16.76	4.36	[-8.32, 17.05]	0.49	.49	.02
	Low eating self-efficacy	129.10	18.55					
2-week follow-up	High eating self-efficacy	102.06	10.23	2.02	[-7.30, 11.34]	0.20	.66	.01
	Low eating self-efficacy	102.90	15.36					

*Note.* High eating self-efficacy group ( $n = 19$ ); low eating self-efficacy group ( $n = 16$ ). Higher disordered eating attitude scores indicate healthier eating attitudes.

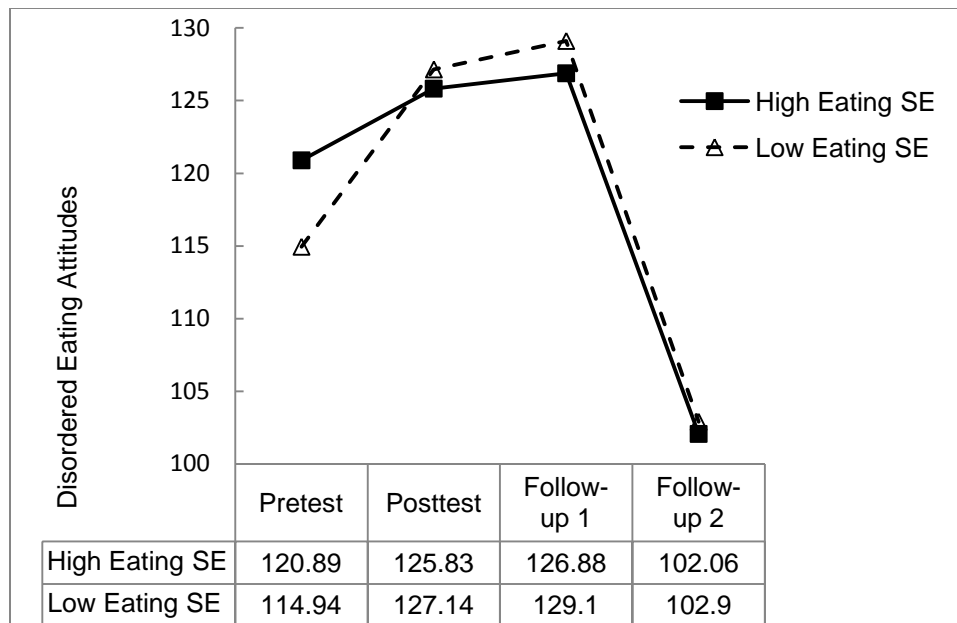


Figure 9. Disordered eating attitudes mean scores over time.

## CHAPTER FIVE: DISCUSSION

To this researcher's knowledge, the present study is the first to test the effectiveness of an intuitive eating intervention designed to increase adaptive eating practices and reduce eating disorder risk factors. The current findings extend past literature by presenting empirical evidence that the intuitive eating model can be a promising approach to disordered eating prevention.

### *Intervention Effects*

The first purpose of the study was to evaluate the effectiveness of an intuitive eating intervention to increase intuitive eating practices and positive body image effects and reduce eating disorder risk factors (i.e., dieting and disordered eating attitudes). The results of the present study support the hypothesized intervention effects for two outcomes (i.e., intuitive eating and dieting) but not for the other two outcomes (i.e., body image effects and disordered eating attitudes).

Confirming the hypothesized effects, important differences were noted in the intuitive eating and dieting outcomes. Results for these effects are discussed in turn. Compared with the control group participants, intervention participants demonstrated significantly more intuitive eating practices at posttest and both follow-up assessments. Effect sizes were consistently large across all time points (Cohen's  $d$  ranged from 0.80 to 0.96;  $CIs$  ranged from 0.30 to 1.46). In theory, exposure and the opportunity to experience the benefits of relying on hunger and satiety cues to guide eating inspired participants to make healthy changes in how much, when, and what they decided to eat. These behavioral changes were qualitatively substantiated by participants' responses to questions about what they learned and wanted to continue applying after the workshop concluded. For example, one participant

commented “I thought a lot more when I was hungry. How hungry am I? What am I hungry for? Why am I hungry?” (see comment 4a from Table 4). These empirical findings are remarkable in that they represent the first study to explore and strongly support the intuitive eating model as an effective approach to strengthening protective factors for continued adaptive eating.

Similarly, consistent with the proposed hypotheses, intervention participants demonstrated significantly less dieting thoughts and behaviors relative to the control group at posttest and final follow up (Cohen’s  $d = .66$  and  $.65$ , respectively;  $CI$ s ranged from 0.17 to 1.15). Theoretically, this study’s findings suggest that the intervention participants’ dieting thoughts and behaviors were significantly reduced as a result of receiving information about the ineffectiveness of dietary restraint to control body size and shape, which motivated them to challenge unhealthy dieting standards. This conceptualization is consistent with the results of prior prevention studies that have also provided psychoeducation with regard to maintaining a healthy body size (Stice et al., 2006; Stice, Trost, & Chase, 2003). The pretest to posttest effect size for dieting in the current study was large, which seems stronger than the posttest effect sizes for control group comparisons found in a trial of a 3-session dissonance-based program ( $r = .27, p < .001$ ) and healthy weight program ( $r = .00$ ; Stice et al., 2006) and an 8-session, Internet-based psychoeducational disordered eating prevention program (Cohen’s  $d = -0.02, p > .05$ ; Zabinski et al., 2004). Though only a 3-session psychoeducational program with applied learning elements, this study’s pretest to 2-week follow-up effect size of dieting (Cohen’s  $d = 0.65, p > .001, 95\% CI [0.17 to 1.14]$ ) for the intervention–control group difference is comparable to the 2-month posttest effect size of an

8-week combined face-to-face/on-line psychoeducation/support program also compared to a control group (Cohen's  $d = 0.48$ ; Celio et al., 2000).

This particular intervention effect is noteworthy given that the modification of unhealthy dieting thoughts and behaviors is an important empirically supported determinant in preventing future eating disorder symptoms (Stice, 2002). With an estimated 10-30% of college women at risk for developing an eating disorder, a brief and widely administered prevention program is needed to reach women who do not readily seek out formal services (Mintz et al., 1997). Based on the above results, the intuitive eating approach holds strong promise as a universal outreach program well-suited for college and general public health settings.

Two aspects of the present study's findings were not consistent with the first set of hypotheses. First, the intuitive eating intervention did not result in any notable changes in the effects of participants' body image across all assessment points. On one hand, it was anticipated that the effects of participants' body image would show relatively less change compared to the effects of intuitive eating and dieting given that the latter received more attention in the intervention content. However, the intervention also spoke to the idea of honoring genetically influenced body diversity and challenging the merits of the thin-ideal female body size and shape idealized in many cultures. Despite this body image component, the intervention did not have a significant impact on participants' perceptions of how their body image affects their social interactions and self-esteem. This nonsignificant result could also be related to the dual-pathway model conceptualization of eating disorder risk. Specifically, this empirically supported model identified thin-ideal internalization and body dissatisfaction as precursors to dieting (Stice, Nemeroff, & Shaw, 1996). Therefore, it is



reasonable to assert that body dissatisfaction or image, as a more longstanding intrapersonal concern, would be less influenced in a psychoeducational intervention spanning a 3-week period of time. This explanation is consistent with other intervention studies that successfully reduced dieting while negative body image remained unaltered (Martz & Bazzini, 1999).

It is also possible that the nature of the measure used for the body image variable contributed to the nonsignificant findings. That is, the body image effects measure may not have been well-suited for detecting discrete changes in how participants experience their body image in their daily lives. Moreover, several items in this measure required participants to rate how their body image affects various interpersonal interactions in addition to other items that emphasized more personally determined indices of emotional well-being. Though phrased to capture how *respondents' perceptions* of their body image affect interpersonal experiences, it could be that responses to the interpersonally based items may include artifacts of how people with whom respondents have contact act towards them. Measures that isolate self-determined perceptions of body image, such as the Body Image States scale (BISS; Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002), may have been better equipped to capture this study's intervention effects for this particular hypothesis.

The second hypothesized outcome not fully supported by the current findings was the intervention effect on disordered eating attitudes. The intervention participants demonstrated significantly more positive eating attitudes relative to the control group at the two follow-up assessments (note: higher scores indicated more positive eating attitudes). However, at the final follow-up assessment, eating attitude improvements declined for both the intervention and control groups to scores lower than were observed at pretest. This is a curious finding given that the intervention and control groups showed improvements in eating attitudes at

posttest and maintained this trend at the 1-week follow up. At first glance, these drops in scores could be interpreted as a decline in functioning for both groups. However, an alternative explanation with regard to how the study impacted the intervention and control group participants is worthy of further examination. Specifically, the intervention group's drop in scores at the final follow up could be attributed to their implementation of the intuitive eating practices learned in the intervention. For instance, through psychoeducation and homework assignments, the intervention participants were encouraged to increase their awareness of their eating habits as a means to increase unconditional eating when hungry and reduce emotion-based eating. As a result, it is possible that, as the study progressed, the intervention participants increasingly endorsed some items on the eating attitudes measure that were originally intended to reflect disordered eating symptoms such as “[I] give too much time and thought to food” or “[I] take longer than others to eat my meals.” However, in the initial stage of becoming an intuitive eater, heightened vigilance while learning these skills is expected and not necessarily indicative of disordered eating (Tribole & Resch, 2003). While not exposed to intervention program content, it could be that the control group participants' awareness of their eating practices also increased as a result of repeatedly completing the assessment measures. These interpretations are indeed speculative at this point and need further exploration in future studies that include alternative treatment comparisons beyond that of an assessment-only group.

#### *Emotional Awareness as a Moderator*

Though general effectiveness studies are vital to improving prevention efforts, another important research focus in intervention research is to identify individual characteristics (e.g., emotional awareness) that may suggest who will benefit more from a

specific intervention (Stice et al., 2007). Following this research line of inquiry, the present study first examined emotional awareness as a moderator for the intuitive eating intervention on the outcomes (i.e., intuitive eating, dieting, body image effects, and disordered eating attitudes). In a study with a small sample size ( $n = 38$ ), an emphasis on effect size estimates to inform conclusions about the findings is a recommended practice (B. Thompson, 2002). Based on this recommendation, the following discussion will take an integrative approach to summarizing conclusions based on the effect size and  $p$  values.

The moderation analysis showed significant interaction effects on the intuitive eating, dieting, and disordered eating attitudes, whereas none were observed for body image effects. For intuitive eating, the results from the simple main effect analyses showed no significant differences across all assessment points. Though moderate effect sizes were observed at pretest (i.e., Cohen's  $d = 0.54$ ) and the 2-week follow up (i.e., Cohen's  $d = 0.58$ ), effect size confidence intervals were indicated to be large or as small as zero. Therefore, the moderate effect sizes at pretest and 2-week follow up are inconclusive and warrant further analysis in a study with a larger sample size.

Based on the above simple main effects, it is possible to conclude that the participants with higher and lower emotional awareness both showed improvements in intuitive eating after the intervention. Thus, it appears the intervention equally benefitted all participants regardless of their level of emotional awareness. These results are different from the original expectation that those with higher levels of emotional awareness would benefit more from the intuitive eating intervention. These results are also inconsistent with a previous study indicating that, compared to individuals with lower emotional awareness, intervention group members with higher emotional awareness benefitted more from an emotion-based substance

abuse treatment approach (Rosenblum et al., 2005). One possible reason for this inconsistency is that this study's intuitive eating intervention included concepts that were compatible with the different processing styles represented in the intervention group. For example, participants with higher emotional awareness were likely more inclined to connect with emotion-based interventions in the program content such as distinguishing hunger from emotional needs. Conversely, those with lower emotional awareness in the present study may have been more receptive to psychoeducational content included in the intervention such as challenging dieting myths.

Though different patterns emerged than anticipated, the moderating effects of emotional awareness on dieting and disordered eating warranted further examination. Specifically, at pretest, effect sizes for dieting and disordered eating attitudes were large (Cohen's  $d = 0.83$  and  $0.78$ , respectively). Then, at posttest and follow-up assessments, there were no significant differences on dieting and disordered eating attitudes (with mostly small effect sizes). The simple main effect results implied that participants with lower emotional awareness started out with stronger adherence to unhealthy dieting standards and disordered eating practices compared to those with higher emotional awareness. However, after attending this intervention, they steadily reduced their dieting practices to the extent that their improvements were almost indistinguishable from those with higher emotional awareness.

As was addressed earlier, those who have difficulty discriminating between various feeling states in the body are more likely to engage in binge-eating when distressed, which in turn may lead to dieting behaviors. The effectiveness of this intervention is important because it helps not only those with higher levels but also those with lower levels of emotional awareness to modify their unhealthy dieting attitudes and disorder eating attitudes

in a positive direction. Similar to the intuitive eating outcomes, the nature of the interactions were not as originally expected (i.e., those with high levels of emotional awareness would benefit more from the intervention). However, the good news is that these results seem to imply that the intervention helped all participants increase their intuitive eating practices and modify their unhealthy dieting and disordered eating tendencies regardless of their level of emotional awareness.

Parallel to the body image effects results described above, the moderation findings for emotional awareness were not significant for this outcome. Possible conclusions with regard to this null finding are likely consistent with those described for the main effects mentioned above.

#### *Eating Self-Efficacy as a Moderator*

The second moderator was eating self-efficacy above and beyond the effects of general self-efficacy. The moderation effects were significant for all outcome variables except dieting. However, the simple main effects were varied for the outcomes with significant findings. For intuitive eating (see Figure 7), the simple main effect analyses indicated that, at pretest, those with higher eating self-efficacy demonstrated significantly greater intuitive eating practices compared to those with lower eating self-efficacy. However, after the intervention, both participant groups increased their levels of intuitive eating practices to similar levels over time. Furthermore, post-hoc intervention effect comparisons (i.e., means difference between pretest and 2-week follow up) indicated that, regardless of their perceived eating self-efficacy, all participants showed improvements in intuitive eating after the intervention, with large effect sizes noted for both groups (Cohen's  $d = 1.24$  and  $2.15$ , higher and lower eating self-efficacy, respectively). One explanation for the substantial

gains made by participants with lower eating self-efficacy is that their confidence with regard to eating habits improved as a result of learning how to apply hunger and fullness cues. This interpretation is consistent with participant feedback summarized in Tables 4 and 5.

The moderation results of eating self-efficacy are inconsistent with a previous study that found a moderation effect of dietary self-efficacy on dietary knowledge and healthy eating behaviors (Saksvig et al., 2005). However, this particular study's findings may not provide the best point of comparison for the effects found in the current study. Namely, the previous study included a sample of children at risk for diabetes who completed a 1-year follow-up assessment from which the pretest comparison was made. It is likely that the children's caregivers participated in modifying the children's eating behaviors, thus introducing a confounding influence not applicable in the present study. More importantly, the follow-up comparisons are inequitable (i.e., 2 weeks versus 1 year) between the current and past study, which precludes definitive conclusions about the consistency of the present study's results with past literature.

For body image effects, results from simple main effect analysis also indicated that, at pretest, the body image effects are higher for those with higher levels of eating self-efficacy than for those with lower levels of eating self-efficacy. Consistent with prior research, body dissatisfaction is predictive of episodes of overeating (Stice, 2001). As such, individuals with lower eating self-efficacy likely experience more body consciousness which in turn may hinder positive or elicit negative social interactions (i.e., body image effects). After the intervention, body image effects were not different between participants with higher and lower eating self-efficacy at posttest and the two follow-up assessments. Furthermore, when a post-hoc analysis was conducted to compare the scores at the final follow up with those at

pretest, participants with lower eating self-efficacy showed significant improvements (Cohen's  $d = 0.68$ ). However, those with higher eating self-efficacy maintained a similar level as the pretest assessment. One possible explanation for these varied findings is that participants with lower eating self-efficacy started out with considerably less positive perceptions of their body image effects compared to those with higher eating self-efficacy. As such, those with lower eating self-efficacy had more range for improvements than did those with higher eating self-efficacy. As mentioned previously, a body image measure that captures more discrete changes in this construct may have been better suited for this brief intervention.

Lastly, the results indicated that there was no significant interaction effect on dieting scores between those with higher and those with lower eating self-efficacy at pretest, posttest, and two follow-up assessments. Similarly, the simple main effect analyses indicated that there were no differences in eating attitudes between those with higher and those with lower eating self-efficacy at pretest, posttest, and two follow-up assessments. The moderation results showed similar patterns as those reported for the intervention effects (i.e., significantly declined final follow-up outcomes below pretest levels for higher and lower eating self-efficacy participants). As mentioned previously, it is possible that the regressed findings could be attributed to participants' implementation of the intuitive eating practices learned in the intervention.

### *Clinical Implications*

The present study's findings provide valuable information for how individual, group, and outreach counselors can promote intuitive practices and in turn reduce the risk of disordered eating when working with female students or clients. Disordered eating

prevention efforts have emphasized primarily assessing intervention effects based on the measurement of sub-threshold and/or clinical threshold eating disorder symptoms. Though this approach has greatly advanced our knowledge of how prevention efforts can reduce eating disorder risk factors, the identification and impact of adaptive eating practices has received little attention in psychological research (Tylka, 2006). The present study's findings address this gap and suggest that the intuitive eating model holds strong promise as both a selective (i.e., risk modification) as well as universal (i.e., strengthen protective factors) intervention.

From a clinical viewpoint, the findings of this study suggest that the intuitive eating intervention could be applied in a variety of service delivery modalities on a college campus such as outreach efforts, small group workshops offered through the counseling or university health centers, inclusion in life skills or wellness course curriculums, and also as a psychoeducational component within individual counseling. A prevention program with the potential to be widely administered is especially critical given that less than 25% of individuals who experience disordered eating symptoms actually seek formal services (Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000). With regard to campus outreach programming, the intuitive eating intervention has the potential to be an ideal approach to disordered eating prevention within sororities. Prior studies have found sorority communities prefer that disordered eating prevention programs be administered to all members in order to maintain a sense of group cohesiveness (Becker et al., 2005). Given that the current study's intervention was administered to a sample of heterogeneous college women (i.e., with and without disordered eating risk factors), it is likely this program could be successfully applied in a sorority setting which would also comprise women with and without risk factors.



In addition to these applications, previous studies indicate that prevention efforts may be more effective when an individual's support system is enlisted in some way (Levine & Piran, 1999). These findings are particularly relevant to the current study in that adding a support person may be a way to lead to better body image outcomes. One possible way to achieve this in an intuitive eating intervention would be to encourage participants to invite an individual from their primary social support network to attend the workshops with them. This extension of the program is consistent with prior research that has shown body acceptance by important others in women's lives is predictive of their own body satisfaction (Avalos, Tylka, & Wood-Barcalow, 2005; Tylka, 2006). Moreover, including someone from participants' support network would lessen the possibility that their efforts in applying intuitive eating are thwarted by peers who are engaging in dieting to achieve an idealized body size and shape.

#### *Limitations*

There are several important limitations that should be noted when interpreting the findings of this study. First, the sample size and thus power to detect intervention and moderation effects were low in this study. It is possible that some of the marginal and nonsignificant findings would have reached significance with a larger sample size. In addition, most participants in this study were young-adult, Euro-American first-year college students (i.e., 49%), limiting the degree to which the results can be generalized to more diverse age groups, men, international women, or women of color.

Although some confounding variables were minimized through the use of a control condition, this design does not rule out the possibility that demand characteristics (i.e., participants' behavior change based on their interpretation of the study's purpose) or

expectancy effects could explain the findings observed in the intervention group. Compared to the experience of those in the assessment-only control group, the intervention participants could have experienced implicit influences to report improvements on the outcome variables.

Though participants were randomly selected for participation in the intervention or control group, there was a potential for selection bias in the consent process. Specifically, the participants in this study were initially provided information about the time commitment involved with two nonspecific options for participation in the intuitive eating study. Though it was not revealed there were intervention and control groups, there was a greater frequency of potential participants who agreed to the option requiring less of a time commitment (i.e., control condition). Thus, it could be that those who participated in the intervention group were qualitatively different in some way than those who participated in the control group. Potential selection bias could also be evidenced by the high number of women screened out by the EDDS as having an eating disorder than would be commensurate with prevalence studies. Mintz et al. (1997) found 4% of first-year college women had eating disorders, whereas 13.1% of women who completed the screening for the current study were identified as likely meeting a diagnosis for anorexia, bulimia, or binge-eating disorder. Women with eating disorders may have been more apt to self-select for the screening portion of this study based on the advertised content (i.e., intuitive eating study).

Lastly, given that I administered the intuitive eating intervention for all intervention participants, it could be that characteristics inherent to my interpersonal style and investment in the research may have introduced experimenter effects that may not be transferable to future studies.

### *Future Research Directions*

Based on the clinical implications as well as limitations reported in this study, there are several directions in which future research can expand on the present findings. Because the findings of this study suggest that the intuitive eating intervention resulted in increased intuitive eating practices and reduced dieting, these findings have important implications for research. Most importantly, given that this was the first study to test the effectiveness of the intuitive eating model, it is necessary that the findings be replicated to garner additional empirical support. Although some of moderation effects did not show noticeable differences, these findings could be useful to inform future avenues of research. For instance, the inclusion of a larger sample size and a more extended longitudinal design would help to clarify the findings that were approaching significance (e.g., emotional awareness as a moderator for intuitive eating). In addition, future studies could expand on the present study by incorporating other report measures to control for social desirability in subjects' responses.

Future studies are also needed to assess the extent to which the intervention effects are sustained over a longer period of time given that the follow-up period for the current study spanned only 2 weeks. In addition, future effectiveness studies should consider including comparisons between the intuitive eating model and alternative conditions such as the dissonance-based and healthy weight programs as well as assessment-only conditions (Stice et al., 2006). Alternative program comparisons could potentially strengthen the support for the intuitive eating program because this methodology would better control for expectancy effects. As mentioned previously, it would also be informative to replicate the intuitive eating intervention using a body image measure with greater sensitivity to

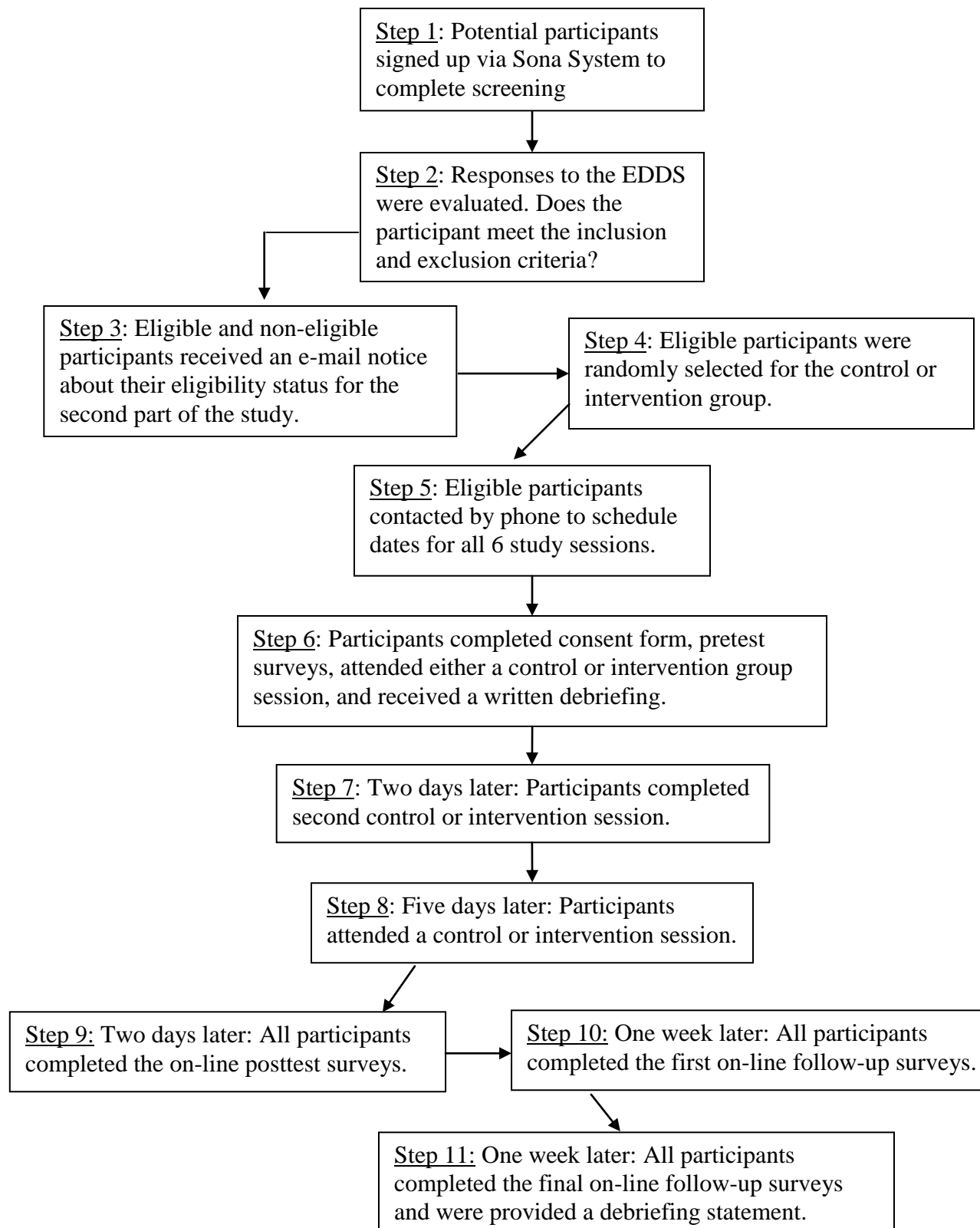
incremental changes in this construct. It is possible there were less overt changes in body image experienced by the intervention participants than were able to be detected by the instrument used in this study. Additionally, future studies could help clarify the unanticipated outcomes of the disordered eating construct examined in the current study. It is possible that the more pathology-based items within the EAT-26 confounded the present results, making it appear as though participants reported increased disordered eating after the intervention. Given the low internal consistency for the Oral Control subscale of the EAT-26 in samples of women without eating disorders, perhaps using either the Bulimia or Dieting subscales may yield more reliable findings (Garner et al., 1982).

The findings of this study also suggest that it may be useful to tailor and test the effectiveness of the intervention within samples beyond that of college women. Previous prospective studies have indicated that disordered eating risk factors typically emerge when females are between the ages of 15 and 19 (Lewinsohn, Striegel-Moore, & Seeley, 2000). An adapted version of the intuitive eating intervention administered to groups of adolescent girls in an educational setting would ultimately serve to decrease the likelihood that those at risk would go on to develop clinical-threshold eating disorders.

Another potential direction for future research could be to examine how the intuitive eating model could be modified as a disordered eating prevention program for men. Unfortunately, it is often the case that men's disordered eating and body image concerns go unrecognized either because they tend not to seek help or their symptoms go undetected (Greenberg & Schoen, 2008). Therefore, an intuitive eating outreach program, perhaps integrated as part of a men's wellness program, would be an ideal format to reach men who are at risk and would not otherwise self-identify as in need of counseling.

Replication of the findings with more diverse ethnic groups is needed as well. For decades, there has been a disproportionate amount of attention given to understanding the etiology and treatment of body dissatisfaction and disordered eating in Euro-American women, neglecting women of color who also experience such concerns. Grabe and Hyde (2006) emphasized that Asian American and Latina females, though their body concerns may manifest differently than that of Euro-American women, reported roughly equivalent levels of body dissatisfaction. Perhaps the intuitive eating intervention could integrate culturally sensitive components to address issues unique to ethnic minority women.

## APPENDIX A: STUDY PROCEDURES FLOWCHART



## APPENDIX B: SURVEYS FOR SCREENING, PRETEST, POSTTEST, AND FOLLOW UPS

## I. Screening: (37 items)

A. Demographic questions (15 items)

B. Eating Disorder Diagnostic Scale (EDDS: 22 items)

## II. Intervention and Control Groups Pretest: (156 items)

- A. Request for last 6 digits of ISU student identification number
- B. Intuitive Eating Scale (IES: 21 items)
- C. Eating Self-Efficacy Scale (ESES: 25 items)
- D. Toronto Alexithymia Scale (TAS-20: 20 items)
- E. General Self-Efficacy Scale (GSES: 30 items)
- F. Eating Attitudes Test (EAT-26: 26 items)
- G. Body Image Quality of Life Inventory (BIQLI: 19 items)
- H. Cognitive Behavioral Dieting Scale (CBDS: 14 items)

III. Intervention and Control Group Posttest and Follow-up Assessments:  
(80 items)

- A. Intuitive Eating Scale (IES: 21 items)
- B. Body Image Quality of Life Inventory (BIQLI: 19 items)
- C. Cognitive Behavioral Dieting Scale (CBDS: 14 items)
- D. Eating Attitudes Test (EAT-26: 26 items)

## APPENDIX C: SONA POSTING DESCRIPTION

## STUDY POSTING FORM

**PRINCIPAL INVESTIGATOR (*Faculty Supervisor*):** Meifen Wei

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**RESEARCHERS:** Shannon Young

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**STUDY NAME & NUMBER:** Intuitive Eating Study: Females Only

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**BRIEF ABSTRACT:**

NONE

**STUDY DESCRIPTION (*Must be exactly as approved by IRB*):**

This study is a 50-minute or less screening survey. Completing the screening survey may make you eligible for other research credits. During the screening, you will be asked to complete demographic questions and questions regarding you physical appearance and eating patterns. After the screening, you will receive 1 credit.

**ELIGIBILITY REQUIREMENTS:** Female and at least 18 years old.

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**DURATION (*Minimum 50min.*):** 50 minutes or less

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**CREDITS:** 1

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**PREPARATION:** NONE

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**IRB APPROVAL NUMBER:** 08-052

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**IRB APPROVAL EXPIRATION:** 2/2010

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**IS THIS AN ONLINE STUDY?** Yes

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## APPENDIX D: ON-LINE SCREENING INFORMED CONSENT DOCUMENT

Title of Study: Intuitive Eating Research Project

Investigators: Shannon Young (Principal Investigator), Dr. Meifen Wei (Faculty Supervisor), Kelly Liao

This is a research study. Please take your time in deciding if you would like to participate. You must be at least 18 years old to participate in this study. As indicated on your course syllabus, participation in research studies is one of the options available to earn experimental credit in your course.

### **INTRODUCTION**

The purpose of this screening survey is to determine if the intuitive eating study would be a good fit for you. This study has been approved by the Office of Research Assurances at Iowa State University (ISU). You are being invited to participate in the screening process of this study because you are a potential member of the psychology department's research participation pool. The screening survey will take about 15-20 minutes to complete.

### **DESCRIPTION OF PROCEDURES**

Your participation in this study is completely voluntary. During the study you may expect to complete some demographic questions and a survey about your perceptions about your physical appearance and eating patterns. You may skip any question that you do not wish to answer or that makes you feel uncomfortable, without receiving any penalty. You may also withdraw from the study at any time. However, for the information to be useful for us, we encourage you to complete all the items as best as you can.

### **RISKS, BENEFITS, AND COSTS**

It is possible that you may experience some mild personal discomfort when responding to personal self-reflective questions related to your perceptions of your physical appearance and eating patterns. However, your participation will involve minimal risks.

It is hoped that the information gained in this study will benefit our professional area in psychology by providing valuable information about intuitive eating and self-perceptions. You will not have any costs associated with your participation. If you decide to complete the survey, you will be given one research credit toward your psychology course grade through the Sona Research System. In addition, if you are eligible and wish to participate in the second stage of this study you will have the opportunity to acquire additional research credits toward your psychology course grade.

### **PARTICIPANTS RIGHTS**

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide not to participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled.

### **CONFIDENTIALITY**

When you complete the screening survey, you will be asked to provide your ISU e-mail address, phone number, and last six digits of ISU student ID number in order for Principal Investigator (PI) to contact you about participating in the second part of the study. Only the PI will have access to this information. The data from your responses will be stored on the PI's computer with password protected computer files. All the contact information will be destroyed when all the data is collected. If the results are published, your identity will remain confidential.

Within 1-2 weeks, you will be notified through e-mail whether or not you are eligible to participate in the second stage of the study. If you are not eligible to continue, an arbitrary identification number will be assigned immediately to your survey responses for the purposes of creating a data file. If you are eligible and you decide to continue with the second stage, the arbitrary identification number will be assigned to your responses after all the data has been collected.

**QUESTIONS OR PROBLEMS**

You are encouraged to ask questions at any time during and/or after the screening survey. For more information about the study, feel free to contact Shannon Young, M.S., [kellim@iastate.edu](mailto:kellim@iastate.edu) or Dr. Meifen Wei, (515) 294-7534, [wei@iastat.edu](mailto:wei@iastat.edu). If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

To continue and consent to the survey, please click the “I Agree and Continue” button.

I Agree and Continue

## APPENDIX E: SCREENING DEBRIEFING FORM

Thank you very much for participating in the screening portion of our study! The screening process that you just completed will help us determine which students could potentially be appropriate for the next stage of our study about intuitive eating. It is possible that some participants may experience mild discomfort from reflecting on factors related to their eating and associated thoughts and behaviors. If you experienced any discomfort, please feel free to contact Shannon Young, M.S., [kellim@iastate.edu](mailto:kellim@iastate.edu); Dr. Meifen Wei, [wei@iastate.edu](mailto:wei@iastate.edu), (515) 294-7534, or the Student Counseling Service, 2223 Student Service Building, 3<sup>rd</sup> Floor, (515) 294-5056. Free counseling is available at the Student Counseling Service for all ISU students. If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

APPENDIX F: E-MAIL NOTIFICATION TEMPLATE REGARDING  
PARTICIPANT ELIGIBILITY

Dear (Non-eligible Student's Name),

Recently, you completed a screening survey for the intuitive eating study and expressed interest in continuing the two-part study on intuitive eating. While we appreciate your interest in this study, there are specific selection criteria. Based on these criteria, we are not able to extend an offer to participate in the second part of this study.

We would like to thank you for your time spent up to this point. If you have any questions about this study feel free to contact either the principal investigator on this project, Shannon Young, [kellim@iastate.edu](mailto:kellim@iastate.edu), or Dr. Meifen Wei, [wei@iastate.edu](mailto:wei@iastate.edu) (515-294-7534).

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

Thanks for your participation,  
Shannon Young  
Principal Investigator

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Dear (Eligible Student's Name),

Recently, you completed a screening survey for the intuitive eating study and expressed interest in continuing the two-part study on intuitive eating. Based on the selection criteria for this study, you are eligible to participate in the second part of the study. Within the next week, you will be contacted by a member of the research team to schedule the remaining five study sessions.

We would like to thank you for your time and interest in helping with our study! If you have any questions about this project feel free to contact either the principal investigator on this project, Shannon Young ([kellim@iastate.edu](mailto:kellim@iastate.edu)) or Dr. Meifen Wei, (515) 294-7534 ([wei@iastate.edu](mailto:wei@iastate.edu))

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

Thanks for your participation,  
Shannon Young  
Principal Investigator

APPENDIX G: REMINDER E-MAIL TEMPLATE REGARDING SCHEDULED  
CONTROL, INTERVENTION, AND FOLLOW-UP SESSIONS

Dear Student:

This is a friendly reminder that you are scheduled to participate in the intuitive eating study on the following dates (*study locations appear next to dates and times*):

(Date/Time/Location)

While participation in this study is completely voluntary, it's very important for you to attend all five sessions to help us best meet the goals of this study. We greatly appreciate your time and interest in being a part of our project!

If you have any questions about this project feel free to contact either the primary investigator on this project, Shannon Young ([kellim@iastate.edu](mailto:kellim@iastate.edu)) or Dr. Meifen Wei, (515) 294-7534 ([wei@iastate.edu](mailto:wei@iastate.edu)).

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

Thanks for your participation,  
Shannon Young  
Principal Investigator

## APPENDIX H: INTERVENTION GROUP INFORMED CONSENT

Title of Study: Intuitive Eating Study

Investigators: Shannon Young (Principal Investigator), Dr. Meifen Wei (Faculty Supervisor), Kelly Liao

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time. You must be at least 18 years old to participate in this study. As indicated on your course syllabus, participation in research studies is one of the options available to earn experimental credit in your course.

### **INTRODUCTION**

The purpose of this study is to learn more about intuitive eating. You are being invited to participate in this study because you are a potential member of the psychology department's research participation pool.

### **DESCRIPTION OF PROCEDURES**

Your participation in this research is completely voluntary. If you agree to participate in this study, your participation will involve completing six sessions total. The first session will last about one and a half hour and the second and third will last about fifty minutes. The first session will involve completing questionnaires and attending a workshop on intuitive eating. The second and third session will involve attending additional intuitive eating workshops. The first, second, and third workshop will also include brief in-session and brief homework assignments. During the fourth, fifth, and sixth sessions, you will be asked to complete questionnaires on-line and offered to register for a drawing worth \$30 when you complete the sixth session. The questionnaires will involve answering questions about how you see yourself physically and emotionally as well as questions regarding eating attitudes and behavior. You may skip any question that you do not wish to answer or that makes you feel uncomfortable, without receiving any penalty. However, for the information to be useful for us, we encourage you to complete all the items as best as you can.

### **RISKS, BENEFITS, COSTS, AND COMPENSATION**

While participating in this study you may experience the following risks: some mild personal discomfort when you respond to the personal self-reflective questions related to eating attitudes and behaviors. It is hoped that the information gained in this study will benefit our professional area in psychology by providing valuable information about intuitive eating and self-perceptions. You will not have any costs associated with participating in this study. If you decide to participate in this study, you will be given two research credits each for the first session and one credit each for the second through sixth sessions. At the sixth session, you will have the opportunity to register for a drawing worth \$30. Registration for the drawing is completely voluntary. For the sixth session, participants can either be given a research credit or receive the \$30, but not both. Thus, if you'd rather earn the credit, please do not register for the drawing. All non-winning participants will be given one research credit for the sixth session.

### **PARTICIPANTS RIGHTS**

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide not to participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled.

**CONFIDENTIALITY**

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. The records may contain private information.

To help protect your confidentiality, each questionnaire packet will only ask for the last six digits of your ISU student identification number in order to match your responses across the sessions involved with this study. In addition, the informed consent signature page will be kept in the primary investigator's locked filing cabinet and separate from your responses to the surveys. After all the data is collected, participants' questionnaire responses will be assigned arbitrary identification numbers for purposes of creating a data file. This data file will be transferred to an SPSS file to which only the principal investigator and faculty supervisor will have access. The data will be stored on the principal investigator's and faculty supervisor's computer with a specific password in order to access the computer file. The six digit student ID number will be destroyed when all the data is collected. If the results are published, your identity will remain confidential.

**QUESTIONS OR PROBLEMS**

You are encouraged to ask questions at any time during this study. For further information about the study contact either the principal investigator, Shannon Young, M.S., [kellim@iastate.edu](mailto:kellim@iastate.edu) or the faculty supervisor, Meifen Wei, Ph.D., Department of Psychology, W214 Lagomarcino Hall, (515) 294-7534, [wei@iastate.edu](mailto:wei@iastate.edu). If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

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**SUBJECT SIGNATURE**

Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You will receive a copy of the signed and dated written informed consent prior to your participation in the study.

Subject's Name (printed)

(Subject's Signature)(Date)

**INVESTIGATOR STATEMENT**

I certify that the participant has been given adequate time to read and learn about the study and all of their questions have been answered. It is my opinion that the participant understands the purpose, risks, benefits and the procedures that will be followed in this study and has voluntarily agreed to participate.

(Signature of Person Obtaining  
Informed Consent)(Date)

## APPENDIX I: CONTROL GROUP INFORMED CONSENT

Title of Study: Intuitive Eating Study

Investigators: Shannon Young (Principal Investigator), Dr. Meifen Wei (Faculty Supervisor), Kelly Liao

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time. You must be at least 18 years old to participate in this study. As indicated on your course syllabus, participation in research studies is one of the options available to earn experimental credit in your course.

### **INTRODUCTION**

The purpose of this study is to learn more about intuitive eating. You are being invited to participate in this study because you are a potential member of the psychology department's research participation pool.

### **DESCRIPTION OF PROCEDURES**

Your participation in this research is completely voluntary. If you agree to participate in this study, your participation will involve completing six sessions total. All six sessions will last about 50 minutes or less and will involve completing questionnaires. The first three sessions will be completed in person, while the final three will be completed on-line. During the sixth session, you will have the opportunity to register for a drawing worth \$30. The questionnaires will involve answering questions about how you see yourself physically and emotionally as well as questions regarding eating attitudes and behavior. You may skip any question that you do not wish to answer or that makes you feel uncomfortable, without receiving any penalty. However, for the information to be useful for us, we encourage you to complete all the items as best as you can.

### **RISKS, BENEFITS, COSTS, AND COMPENSATION**

While participating in this study you may experience the following risks: some mild personal discomfort when you respond to the personal self-reflective questions related to eating attitudes and behaviors. It is hoped that the information gained in this study will benefit our professional area in psychology by providing valuable information about intuitive eating and self-perceptions. You will not have any costs associated with participating in this study. If you decide to participate in this study, you will be given one research credit toward your psychology course grade for each session. At the sixth session, you will have the opportunity to register for a drawing worth \$30. Registration for the drawing is completely voluntary. For the sixth session, participants can either be given a research credit or receive the \$30, but not both. Thus, if you'd rather earn the credit, please do not register for the drawing. All non-winning participants will be given one research credit for the sixth session.

### **PARTICIPANTS RIGHTS**

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide not to participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled.

### **CONFIDENTIALITY**

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies and the Institutional Review Board (a committee that reviews and approves human subject



research studies) may inspect and/or copy your records for quality assurance and data analysis. The records may contain private information.

To help protect your confidentiality, each questionnaire packet will only ask for the last six digits of your ISU student identification number in order to match your responses across the sessions involved with this study. In addition, the informed consent signature page will be kept in the primary investigator's locked filing cabinet and separate from your responses to the surveys. After all the data is collected, participants' questionnaire responses will be assigned arbitrary identification numbers for purposes of creating a data file. This data file will be transferred to an SPSS file to which only the principal investigator and faculty supervisor will have access. The data will be stored on the principal investigator's and faculty supervisor's computer with a specific password in order to access the computer file. The six digit student ID number will be destroyed when all the data is collected. If the results are published, your identity will remain confidential.

### ***QUESTIONS OR PROBLEMS***

You are encouraged to ask questions at any time during this study. For further information about the study contact either the principal investigator, Shannon Young, M.S., [kellim@iastate.edu](mailto:kellim@iastate.edu) or the faculty supervisor, Meifen Wei, Ph.D., Department of Psychology, W214 Lagomarcino Hall, (515) 294-7534, [wei@iastate.edu](mailto:wei@iastate.edu). If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

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### ***SUBJECT SIGNATURE***

Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You will receive a copy of the signed and dated written informed consent prior to your participation in the study.

Subject's Name (printed)

(Subject's Signature)(Date)

### ***INVESTIGATOR STATEMENT***

I certify that the participant has been given adequate time to read and learn about the study and all of their questions have been answered. It is my opinion that the participant understands the purpose, risks, benefits and the procedures that will be followed in this study and has voluntarily agreed to participate.

(Signature of Person Obtaining  
Informed Consent)(Date)

## APPENDIX J: DEBRIEFING FORMS

### **Intervention Group Pretest, Posttest, and Follow-Up Debriefing Form**

Thank you very much for participating in our study! This study is to further our understanding of intuitive eating. Your participation in the study also gives us important information about how to design better programs in the future. It is possible that some participants may experience mild discomfort from reflecting on factors related to their eating and associated thoughts and behaviors. If you experienced any discomfort, please feel free to contact Shannon Young, M.S., [kellim@iastate.edu](mailto:kellim@iastate.edu); Dr. Meifen Wei, [wei@iastate.edu](mailto:wei@iastate.edu), (515) 294-7534, or the Student Counseling Service, 2223 Student Service Building, 3<sup>rd</sup> Floor, (515) 294-5056. Free counseling is available at the Student Counseling Service for all ISU students. If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

### **Control Group Pretest, Posttest, and Follow-Up Debriefing Form**

Thank you very much for participating in our study! This study is to further our understanding of intuitive eating. It is possible that some participants may experience mild discomfort from reflecting on factors related to their eating and associated thoughts and behaviors. If you experienced any discomfort, please feel free to contact Shannon Young, M.S., [kellim@iastate.edu](mailto:kellim@iastate.edu); Dr. Meifen Wei, [wei@iastate.edu](mailto:wei@iastate.edu), (515) 294-7534, or the Student Counseling Service, 2223 Student Service Building, 3<sup>rd</sup> Floor, (515) 294-5056. Free counseling is available at the Student Counseling Service for all ISU students. If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

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