RELATIONSHIP BETWEEN BODY IMAGE DISCREPANCY
AND INTUITIVE EATING

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ABSTRACT OF THE THESIS

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Obesity is a national epidemic that contributes to preventable causes of death in the U.S. College students are particularly susceptible to overweight and obesity, and women are at increased risk of weight gain during the transition from high school. Dieting is a widespread practice among college women, but is ineffective and harmful in the long term. Intuitive eating offers a non-dieting alternative to weight management, teaching participants to eat only in response to hunger and satiety cues. Key components of intuitive eating include unconditional permission to eat, eating for physical rather than emotional reasons, reliance on hunger and satiety cues, and body-food choice congruence. It has been associated with improved physical and psychological health and has been studied in association with various dimensions of body image. Body Image Discrepancy (BID) represents whether a respondent believes her current body is larger or smaller than ideal. The association between BID and intuitive eating has not been studied.

Given the prevalence of overweight and obesity in U.S. women and the role BID and intuitive eating might play in weight management, it is important to understand their relationship. The current study examined the relationship between BID and intuitive eating, controlling for BMI as a potential confounder. Analyses also examined the relationship between BID and each independent intuitive eating component. In addition, exploratory analyses examined the relationship between healthy-ideal discrepancy (HID), a different body image dimension, and intuitive eating. A sample of 44 SDSU freshmen completed baseline measurements as part of the Be In Tune with your Eating intervention.

Results indicated greater BID was negatively associated with intuitive eating. Participants who believed that their current bodies were larger than ideal were less likely to honor hunger and satiety cues than participants who expressed little or no BID. HID and intuitive eating were not associated. Thus, the difference between current and ideal sizes appears to be more influential than the difference between healthy and ideal sizes. Women with high BID are less likely to eat intuitively, and should be targeted in future weight management interventions in order to avoid the negative health outcomes associated with dieting.
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CHAPTER 1

INTRODUCTION

Obesity is a national epidemic that contributes to some of the leading preventable causes of death in the United States including heart disease, stroke, and diabetes (Biro & Wien, 2010). Over 60% of adults 20-39 and 34.5% of adolescents 12-19 are overweight or obese, with a body mass index (BMI) above 25 (Ogden, Carroll, Kit, & Flegal, 2014). The U.S. college population is particularly susceptible to overweight and obesity (Desai, Miller, Staples, & Bravender, 2008). Studies have shown that average weight gain during the transition to college is greater than national averages in the same age group (Harring, Montgomery, & Hardin, 2010; Holm-Denoma, Joiner, Vohs, & Heatherton, 2008; Wengreen & Moncur, 2009). Women are at increased risk of unwanted weight gain during the transition from high school to college (Malinauskas, Raedeke, Aeby, Smith, & Dallas, 2006) and experience greater average weight gain in college compared to men (Economos, Hildebrandt, & Hyatt, 2008; Holm-Denoma et al., 2008; Malinauskas et al., 2006).

Despite such high overweight and obesity prevalence rates, dieting is a widespread practice in the U.S. (Pillitteri et al., 2008). A greater percentage of women report dieting compared to men (Smith & Hawks, 2006). In addition, disordered eating including fasting, self-induced vomiting, or taking diet pills or laxatives, is prevalent in college students (Harring et al., 2010; Kelly-Weeder, 2011). Studies show that up to 61.2% of college women are trying to lose weight (Wardle, Haase, & Steptoe, 2006) by dieting or using the aforementioned weight-loss strategies.

In the long term, diets are both ineffective in that they do not result in desired weight loss, and harmful in that they yield negative health outcomes (Schaefer & Magnuson, 2014; Van Dyke & Drinkwater, 2013). Despite successful short-term weight loss, restrictive energy diets rarely maintain intended long-term weight loss (Cachelin & Regan, 2006; Mann et al., 2007; Schaefer & Magnuson, 2014). Instead, diets are associated with weight gain (Mann et
al., 2007), increased mortality from cardiovascular disease, myocardial infarction, stroke, or diabetes (Mann et al., 2007), and is a well-established risk factor for depression (Cachelin & Regan, 2006; Johnson & Wardle, 2005), body dissatisfaction, lower self-esteem (Johnson & Wardle, 2005), and the development of eating disorders (Cachelin & Regan, 2006; Neumark-Sztainer et al., 2006).

“Intuitive eating” offers an alternative weight management approach to dieting. Intuitive eating has been described as eating only in response to physical hunger and satiety cues rather than for emotional, environmental, or social reasons (Gast, Madanat, & Nielson, 2012; Tribole & Resch, 2012; Tylka & Kroon Van Diest, 2013). Key components of intuitive eating include unconditional permission to eat, eating for physical rather than emotional reasons, reliance on hunger and satiety cues, and body-food choice congruence. Intuitive eating has been used in many weight management interventions, mostly with women and college students (Avalos & Tylka, 2006; Hawks, Madanat, Hawks, & Harris, 2005; Tylka & Kroon Van Diest, 2013; Van Dyke & Drinkwater, 2013). Further, studies have established an association between intuitive eating and several markers of improved physical and psychological health including decreased BMI, decreased depression, and increased self-esteem (Bacon et al., 2002; Bacon, Stern, Van Loan, & Keim, 2005; Carroll, Borkoles, & Polman, 2007; Ciampolini, Lovell-Smith, & Sifone, 2010; Cole & Horacek, 2010; Gagnon-Girouard et al., 2010; Provencher et al., 2007; Timmerman & Brown, 2012).

The Acceptance Model of Intuitive Eating includes four constructs (e.g. social support, body acceptance by others, resisting the observer’s perspective, and body appreciation) that predict intuitive eating scores (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). For example, greater perceived social support is associated with higher body acceptance by others, greater resistance of an observer’s perspective, higher body appreciation, and ultimately intuitive eating scores (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). The model suggests that women who appreciate their bodies are more likely to eat intuitively (Augustus-Horvath & Tylka, 2011). However, the body appreciation construct in the Acceptance Model represents only one dimension of body image overall.

Indeed, body image is a multidimensional concept involving perceptions, feelings, and attitudes about one’s physical appearance (Cash & Fleming, 2002; Cash, Morrow,
Hrabosky, & Perry, 2004). Negative body image has received significantly more attention than positive body image in research and clinical settings, partly due to its association with adverse health outcomes. Western women are particularly susceptible to negative body image and associated outcomes (Cash & Grasso, 2005; Cash et al., 2004). Sociocultural body image standards (e.g. media influence) and interpersonal factors (e.g. pressure from friends) contribute to the prevalence of negative body image or body image disturbance, and distortion in the way one perceives his or her body (Rucker & Cash, 1992; Shroff, Calogero, & Thompson, 2009). Body image has been defined and measured in many different ways, and most body image instruments measure just one dimension of body image (e.g. fear of fat), failing to represent the concept as a whole and making body image findings difficult to compare (Banfield & McCabe, 2002). Intuitive eating has been studied in association with dimensions of body image including body avoidance and body appreciation (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Bacon et al., 2005; Schoenefeld & Webb, 2013; Van Dyke & Drinkwater, 2013).

One measure of body image is body image discrepancy (BID). BID is defined by the difference between one’s perceived current body image and ideal body image in a Figure Rating Scale (Fitzgibbon, Blackman, & Avellone, 2000). The difference between current body image and ideal body image determines whether the respondent believes her current body is larger or smaller than ideal. The discrepancy between individuals’ current and ideal body size is used as an index of dissatisfaction (Shroff et al., 2009). For example, women with high BID are thought to use unhealthful strategies for weight control, which can lead to anorexia nervosa or bulimia nervosa (Cachelin, Rebeck, Chung, & Pelayo, 2002; Fitzgibbon et al., 2000). This dissatisfaction affects women’s self-esteem and subsequent weight management behaviors (Banitt et al., 2008; Fitzgibbon et al., 2000) including the extent to which they honor hunger and satiety cues.

The current study examined the relationship between BID and intuitive eating, controlling for the potential confounder of BMI. How women see and feel about their bodies predicts how they will respond to weight change and weight control (Fitzgibbon et al., 2000; Rucker & Cash, 1992). As such, BID is a domain of body image that may play a role in weight loss activities. The study hypothesized that women with greater BID would be less likely to eat intuitively. Study analyses also examined the relationship between BID and each
independent intuitive eating component. In addition, exploratory analyses examined the relationship between healthy-ideal discrepancy (HID), a different dimension of body image, and intuitive eating. The difference between healthy and ideal body size determines whether the respondent believes an ideal size is larger or smaller than healthy. Evaluation of this discrepancy draws attention to the different influences created by one’s perception of a healthy size vs. an ideal size. Uncovering the relationship between BID or HID and intuitive eating can contribute to a more complete understanding of the relationship between body image as a multidimensional concept and intuitive eating. This may ultimately have implications for research on eating behavior.
CHAPTER 2

LITERATURE REVIEW

Obesity is a national epidemic that contributes to some of the leading preventable causes of death in the United States including heart disease, stroke, and diabetes (Biro & Wien, 2010). More than one-third of U.S. adults ages 20-39 and 20.5% of adolescents ages 12-19 are considered obese, having a body mass index (BMI) that exceeds 30. Additionally, 60.3% of adults and 34.5% of adolescents in the same age range are overweight or obese, with a BMI above 25 (Ogden et al., 2014). Data from 79,266 college students across 140 institutions indicated that 22.5% of college students are overweight and 12.1% are obese, with a mean BMI of 24.5 (American College Health Association, 2014). Rates of overweight and obesity in this population are higher than in previous years and are increasing (Desai et al., 2008).

Weight gain is of particular concern to many college freshmen. The “freshman fifteen” is a familiar concept that refers to weight gain up to 15 pounds during students’ first year of college (Holm-Denoma et al., 2008; Malinauskas et al., 2006). Indeed, studies have shown that average weight gain during the transition to college is greater than national averages in the same age group (Harring et al., 2010; Holm-Denoma et al., 2008; Wengreen & Moncur, 2009). College women specifically are at increased risk of unwanted weight gain during the transition from high school to college (Malinauskas et al., 2006). In studies assessing both men and women, weight gain was greater in women than men (Economos et al., 2008; Holm-Denoma et al., 2008). In one study of 607 college freshmen (56.2% female, n=341), average weight gain in women was 4 pounds between spring of their senior year of high school and, on average, 9 months later (Holm-Denoma et al., 2008). Another study involving 396 college freshmen (64.6% female, n=256) showed an average weight gain of 5.5 pounds in women over 8 months of their freshman year of college (Economos et al.,
2008). In one study of only female freshmen, 83% of participants gained weight between September and May of their freshman year (Lowe et al., 2006).

In the United States, watching television, relying on automobiles, food prices, density of fast food outlets, and advertisement of junk food are all considered environmental contributors to weight gain through their impact on behaviors (Nestle & Jacobson, 2000). Studies show that predictors of weight gain specifically in the first year of college include decreased levels of physical activity (Wengreen & Moncur, 2009), increased levels of stress (Harring et al., 2010), relationships with parents (Holm-Denoma et al., 2008), independent meal planning, food and beverage selections (Harring et al., 2010), and decreased quality of overall diet that is high in fat, sugar, and sodium, and low in fruits and vegetables (Anding, Suminski, & Boss, 2001; Harring et al., 2010; Holm-Denoma et al., 2008; Wengreen & Moncur, 2009). In a 2005 longitudinal study of 159 college freshmen (64% female, n=102), 23% of participants gained more than 5% of their body weight between August and December. Those who experienced significant weight gain reported decreased levels of physical activity compared to levels in high school and were also less physically active when compared to those without significant weight gain (Wengreen & Moncur, 2009). In another longitudinal study of 607 students (56% female, n=341), participants gained an average of 3.5 to 4 pounds. A major predictor of weight gain was troublesome relationships with parents in men, whereas positive relationships with parents was a predictor of weight gain in women (Holm-Denoma et al., 2008). One study of women only (N=60) demonstrated that weight gain during the transition from high school to college was associated with a poor quality of diet compared to recommendations from the Dietary Guidelines for Americans (DGA; Anding et al., 2001).

Despite the increasing rates of obesity and weight gain, the prevalence of dieting in the U.S. is also growing. Dieting involves restricting energy intake to lose or maintain weight (Gingras, Harber, Field, & Mccargar, 2000). Indeed, over 97,000 “weight loss” books are sold on Amazon today (Amazon, 2014), contributing to the U.S. weight loss market valued at $60.5 billion (Marketdata Enterprises Inc., 2014). American women in particular are preoccupied with what is called “chronic dieting” (Bacon et al., 2005; Cachelin & Regan, 2006; Gingras et al., 2000) or excessive dieting, constantly focusing on or participating in fad or other restrictive diets. Dieting has become so widespread among U.S. women that this
restrictive eating style (i.e. controlled meal plans, avoidance of certain foods, and/or restricted intake of calories) has become the norm (Hawks et al., 2005; Pillitteri et al., 2008). In a 2005 national telephone survey, 57% of women reported dieting in order to combat weight gain (Neumark-Sztainer et al., 2000), and every year millions enroll in commercial and self-help weight loss programs that share this restrictive eating model (Tsai & Wadden, 2005). Different studies have found different associations between chronic dieting and body mass index (BMI; Quick & Byrd-Bredbenner, 2012), ethnicity, weight history, depression (Cachelin & Regan, 2006), age at first diet, and body dissatisfaction (McCargar & McBurney, 1999). Although findings differ, there is consensus that women are most likely to practice restrictive eating (Cachelin & Regan, 2006). A cross-sectional study by Smith and Hawks (2006) involving 343 college students (39.7% female, n=136) demonstrated that significantly more women than men ate restrictively in order to lose weight. Although a greater percentage of participating men were overweight or obese (25.7%) compared to women (15.9%), 54% of women wanted to lose weight compared to only 25.2% men. As such, a greater percentage of women vs. men dieted or practiced restrictive eating (Smith & Hawks, 2006).

In part due to the aforementioned fear of gaining the “freshman fifteen” (Holm-Denoma et al., 2008), there is a high prevalence of disordered eating among college students (Kelly-Weeder, 2011). Disordered eating involves excessive concern about weight, binge eating, or extreme methods of weight control (i.e. fasting), and has been associated with eating disorders (Kelly-Weeder, 2011). Concern for weight gain not only encourages dieting, but also exacerbates disordered eating that so many college women already experience (Malinauskas et al., 2006). Indeed, college students are especially prone to unhealthy weight loss strategies, including fasting, self-induced vomiting or taking diet pills or laxatives (Harring et al., 2010; Kelly-Weeder, 2011). College-aged women are particularly vulnerable to these unhealthy weight loss strategies (Kelly-Weeder, 2011; Lowry et al., 2000), irrespective of weight status (Harring et al., 2010; Malinauskas et al., 2006). Two studies showed significant percentages (59.0% and 61.2%, respectively) of college women trying to lose weight (Harring et al., 2010; Wardle et al., 2006). College years represent a significant stage in life during which many students form lifelong habits (Harring et al., 2010). With
such a high prevalence of college women trying to lose weight using unhealthy strategies, this population is drawing attention to the adverse effects of chronic dieting.

There are many reasons women diet, including pressure from family and friends and prevention of disease (Dunkley, Wertheim, & Paxton, 2001). Among these, mass media including television, magazines, and food advertisements play a significant role in perpetuating the U.S. cultural preoccupation with weight in defining the thin ideal, (Dunkley et al., 2001; Quick & Byrd-Bredbenner, 2014) a body shape that is unattainable for most. For decades, American norms and values represented in mass media have been transitioning toward a thinner female figure as most desirable (Dunkley et al., 2001). This has contributed to body dissatisfaction (displeasure with one’s size) among women (Groesz, Levine, & Murnen, 2002; Madanat, Lindsay, Hawks, & Ding, 2011; Malinauskas et al., 2006; Quick & Byrd-Bredbenner, 2012). In a study involving 1,826 female college students from the U.S., China, Japan, and Jordan, U.S. women (n=432) reported highest usage of media channels as a source of information for body image compared to their Chinese, Japanese, and Jordanian counterparts (Madanat et al., 2011). In another study of 185 female college students, over half of the participants reported pressure to weigh a certain amount, with primary sources of this pressure stemming from self, media, and friends (Malinauskas et al., 2006). A meta-analysis of 25 studies determined that women have significantly higher body dissatisfaction after exposure to thin media images as compared to average or overweight images (Groesz et al., 2002). Thus, mass media idealization of thinness and subsequent internalization by its female consumers has perpetuated a culture of negative body image (Madanat et al., 2011), chronic dieting, and has in some cases predicted eating disorders (Groesz et al., 2002; Harrison, Cantor, & Madison, 1997; Quick & Byrd-Bredbenner, 2014). U.S. media have a tremendous impact on college women, encouraging them to use media images as a standard of comparison and influencing their eating behavior (Groesz et al., 2002).

Popular weight loss programs further endorse this ideal and prescribe a restricted diet (Tsai & Wadden, 2005). In the long term, these programs are both ineffective in that they do not result in desired weight loss, and harmful in that they often result in negative health outcomes (Schaefer & Magnuson, 2014; Van Dyke & Drinkwater, 2013). Evidence shows that despite successful short-term weight loss, restrictive energy diets rarely maintain intended long-term weight loss (Cachelin & Regan, 2006; Mann et al., 2007; Schaefer &
Magnuson, 2014). Instead, severe restriction of calorie intake is associated with weight gain in the majority of dieters (Mann et al., 2007). Weight loss and subsequent weight regain, also called “weight cycling” or “yo-yo dieting,” in itself is associated with adverse physical health effects like increased mortality from cardiovascular disease, myocardial infarction, stroke, or diabetes (Mann et al., 2007). Additionally, dieting is a well-established risk factor for adverse psychological health effects like depression (Cachelin & Regan, 2006; Johnson & Wardle, 2005), body dissatisfaction, lower self-esteem (Johnson & Wardle, 2005), and the development of eating disorders (Cachelin & Regan, 2006; Neumark-Sztainer et al., 2006). In general, evidence shows that restrictive eating does not lead to sustained improvements in weight or health.

“Intuitive eating” offers an alternative weight management approach to the restrictive dieting model. It has been used in many weight management interventions with women and college students, and across different studies has been called “Health at Every Size,” “non-diet,” and “natural eating” (Avalos & Tylka, 2006; Hawks et al., 2005; Schaefer & Magnuson, 2014; Tylka & Kroon Van Diest, 2013; Van Dyke & Drinkwater, 2013). Counter to eating styles that disrupt biological hunger cues in the pursuit of weight loss, this “anti-dieting” approach to eating has attracted the attention of much research (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Bacon et al., 2005; Denny, Loth, Eisenberg, & Neumark-Sztainer, 2013; Gast et al., 2012; Hawks et al., 2005; Malinauskas et al., 2006; Schaefer & Magnuson, 2014; Schoenefeld & Webb, 2013; Smith & Hawks, 2006; Tylka & Kroon Van Diest, 2013; Tylka, 2006; Van Dyke & Drinkwater, 2013). Intuitive eating has been described as eating only in response to physical hunger and satiety cues rather than for emotional, environmental, or social reasons (Gast et al., 2012; Tribole & Resch, 2012; Tylka & Kroon Van Diest, 2013). In addition, individuals who eat intuitively trust their body signals to tell them when and how much to eat, do not limit food choices by labeling them as “good” or “bad,” and are less likely to experience feelings of guilt or deprivation because of food choices (Augustus-Horvath & Tylka, 2011; Gast et al., 2012; Tylka & Kroon Van Diest, 2013; Van Dyke & Drinkwater, 2013).

The Intuitive Eating Scale-2 (IES-2) measures whether or not individuals eat intuitively and the degree to which they honor physical hunger and satiety cues. The four key components of intuitive eating measured by the scale include unconditional permission to
eat, eating for physical rather than emotional reasons, reliance on hunger and satiety cues, and body-food choice congruence (Tylka & Kroon Van Diest, 2013). Higher subscale scores indicate greater adherence to intuitive eating principles. Individuals who give themselves unconditional permission to eat do not label foods as good or bad, and the benefits of such unconditional permission include increased body appreciation and decreased eating disorder symptomatology. Additionally, individuals who eat for physical reasons rather than out of boredom, loneliness, or other emotional reasons experience less body shame (Tylka & Kroon Van Diest, 2013). Another type of intuitive eating is represented by individuals who rely on hunger and satiety cues to tell them when and how much to eat. These individuals demonstrate trust in their bodies, and as a result have increased self-esteem and decreased eating disorder symptomology compared to those who do not. Finally, individuals who exhibit high body-food choice congruence choose foods based on their bodies’ needs, and this eating behavior has been associated with increased life satisfaction (Tylka & Kroon Van Diest, 2013).

Studies have explored both the physical and psychological health outcomes associated with intuitive eating. Hawks et al. (2005) recruited a sample of 32 female college women (18-22 years) to investigate the relationship between intuitive eating and physical measures including glucose levels, cholesterol, high- and low-density lipoproteins, triglycerides, iron and total iron binding capacity, BMI, percent body fat, and estimated maximal oxygen uptake. Cross-sectional analyses compared high intuitive eating scores to low intuitive eating scores based on the median overall IES-2 score. Intuitive eating was associated with lower BMI (p ≤ .01), higher high-density lipoproteins levels (p ≤ .05), lower triglycerides (p ≤ .05), and lower total iron binding capacity (p ≤ .05). No significant differences were found between high and low intuitive eaters on glucose, cholesterol, low-density lipoproteins, or iron (Hawks et al., 2005). In contrast, Schoenefeld and Webb (2013) explored the psychological health outcomes associated with intuitive eating in a sample of 322 female college students (18-24 years). They collected demographic information (sex, age, ethnicity, mother’s education level, current year in college), height and weight (self-reported) to calculate BMI, and also administered online surveys including the Intuitive Eating Scale, the Self-Compassion Scale (SCS; Neff, 2003), the Distress Tolerance Scale (DTS; Simons & Gaher, 2005), and the Body Image-Acceptance and Action Questionnaire
The SCS measures Self-Compassion across 3 subscales (self-kindness, common humanity, and mindfulness), with higher scores indicating higher self-compassion. The DTS measures an individual’s expectations and evaluations of experiencing negative emotional states, with higher scores indicating higher distress tolerance. The BI-AAQ measures the acceptance of one’s thoughts, feelings, and emotions toward the body in the service of pursuing valued action, with higher scores indicating higher levels of body image flexibility (Schoenefeld & Webb, 2013). Cross-sectional analyses demonstrated that body image acceptance and action helped explain the significant relationship between self-compassion and intuitive eating ($p \leq .001$), but that distress tolerance did not contribute to an explanation of the relationship (Schoenefeld & Webb, 2013).

The Acceptance Model of Intuitive Eating suggests that four constructs together predict intuitive eating. The constructs include perceived social support, body acceptance by others, resisting an observer’s perspective of the body, and body appreciation (Augustus-Horvath & Tylka, 2011). Perceived social support is measured by the Social Provisions Scale (SPS), which assesses perceived social support and acceptance within respondents’ relationships (Cutrona & Russell, 1987). Higher SPS scores indicate greater overall support. Body acceptance by others is measured by the Body Acceptance by Others Scale (BAOS), which assesses overall environmental acceptance regarding body shape and weight (Avalos & Tylka, 2006). Higher BAOS scores indicate greater perceived acceptance of body shape and/or weight. Resistance of an observer’s perspective of the body is measured by a modified version of the Body Surveillance subscale of the Objectified Body Consciousness Scale (McKinley & Hyde, 1996), which assesses the degree to which a woman has internalized an observer’s perspective of her body. Augustus-Horvath and Tylka (2011) modified this subscale to measure resistance to adopt an observer’s perspective of the body rather than internalization of an observer’s perspective, with higher scores reflecting greater resistance. Finally, body appreciation is measured by the Body Appreciation Scale (BAS), which assesses positive body image (Avalos, Tylka, & Wood-Barcalow, 2005). Higher BAS scores indicate greater body appreciation. The model indicates that greater perceived social support is associated with higher body acceptance by others, higher resistance of an observer’s perspective, higher body appreciation, and ultimately higher levels of intuitive eating.
behavior (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). Perceived social support elicits women’s perception that others accept their body (Path a; Kearney-Cooke & Isaacs, 2004). Additionally, if women perceive body acceptance by others, they are more likely to resist an observer’s perspective of their body (Path b). As women’s body acceptance by others increases, appreciation of their own body increases (Path c). Also, resisting an observer’s perspective of their body increases intuitive eating (Path e); resisting others’ perspectives directly increases attention to internal hunger and satiety cues (Tylka, 2006). Finally, women who appreciate their bodies are more likely to eat intuitively or in response to those cues (Path f). A study of 318 women ages 18-25 tested this model by examining the comparative fit index, the standardized root-mean-square residual, and the root-mean-square error of approximation, and demonstrated that the overall model is a good fit for this age group (Augustus-Horvath & Tylka, 2011).

Figure 1. The acceptance model of intuitive eating.

**BODY IMAGE AND INTUITIVE EATING**

Body image has been studied in association with intuitive eating (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Bacon et al., 2005; Schoenefeld & Webb, 2013; Van Dyke & Drinkwater, 2013). Body image is a multidimensional concept involving perceptions, feelings, and attitudes about one’s physical appearance (Cash & Fleming, 2002; Cash et al., 2004). It has been defined as an internal representation or psychological
experience of an individual’s body and its functioning (King, Matacin, White, & Marcus, 2005). The concept of body image has been studied by researchers across a variety of disciplines, whose differing schools of thought have yielded many different operationalizations of the term (Shroff et al., 2009). However, among the various dimensions exist four popular categories: behavioral body image, cognitive body image, perceptual body image, and affective body image (Banfield & McCabe, 2002). These categories are reflected in the many measures of body image that have been developed. Most body image instruments measure just one dimension of body image (e.g. fear of fat) rather than body image as a whole (Shroff et al., 2009). Consequentially, body image research often denotes one dimension of body image as a representation of the entire multidimensional concept, creating a fragmented view and making body image findings difficult to compare (Banfield & McCabe, 2002).

Behavioral assessments of body image consider the specific manifestations of body image disturbance (e.g. dieting or avoidance; Shroff et al., 2009). Examples of behavioral assessments include the Body Checking Questionnaire, a 23-item instrument that indexes a variety of body-checking behaviors such as ritualistic weighing or looking in the mirror (Reas, Whisenhunt, Netemeyer, & Williamson, 2002) and the Body Image Avoidance Questionnaire, a 19-item instrument that measures avoidance of situations that provoke concern about physical appearance (Rosen, Srebnik, Saltzberg, & Wendt, 1991). Body image avoidance is one such dimension of body image that has been studied in association with intuitive eating (Bacon et al., 2005). The study randomized 78 women ages 30-45 into “health at every size” (intuitive eating) or a “diet” group to examine the effectiveness of intuitive eating in improving anthropometric and psychological outcomes. The “health at every size” group demonstrated significant improvement (p ≤ .01) in body image avoidance behaviors compared to the diet group (Bacon et al., 2005).

Cognitive measures of body image evaluate thoughts and beliefs about one’s body shape appearance (Banfield & McCabe, 2002; Shroff et al., 2009). Examples of cognitive measures include the Assessment of Body Image Cognitions, a 37-item instrument that assesses eight different types of disordered thinking about physical appearance (Jakatdar, Cash, & Engle, 2006) and the Beliefs about Appearance Scale, a 20-item instrument that
assesses one’s beliefs about consequences of appearance for relationships, achievement, self-view, and feelings (Spangler & Stice, 2001).

Perceptual body image refers to the accuracy of individuals’ body size estimations relative to their actual size (Flynn & Fitzgibbon, 1998). Though seldom used in clinical practice (Shroff et al., 2009), perceptual body image can be measured by asking participants to estimate the size of their bodies and parts (e.g. compared to judges’ estimations) or to estimate their own weight relative to medical standards (Flynn & Fitzgibbon, 1998).

Contrary to cognitive measures that evaluate how people think about their bodies or perceptual measures that evaluate how people view their bodies, affective measures of body image evaluate how people feel about their bodies. Affective measures are related to body image satisfaction (e.g. of specific areas of the body or of overall body appearance; Shroff et al., 2009). Examples of affective measures include the Body Esteem Scale, a 23-item instrument that assesses evaluation of one’s body across appearance, weight, and attribution subscales (Mendelson, Mendelson, & White, 2001) and the Figure Rating Scale, an instrument that contains 9 body silhouettes ranging from severely underweight to severely overweight (Stunkard, Sørensen, & Schulsinger, 1983). Respondents then answer questions such as which silhouette among them represents their ideal figure, how they think they look, and which they think is most preferred by men or women (Thompson & Altabe, 1991).

Body image can range from positive to negative (Avalos et al., 2005). Qualities of positive body image include favorable opinions of the body regardless of actual physical appearance, acceptance of the body in spite of imperfections, respect for the body by engaging in healthy behaviors, and protection of the body by rejecting unrealistic body image standards. In general, positive body image is associated with positive health outcomes (Avalos et al., 2005). A 2015 study involving 284 college students (60% female, n=170) investigated the relationship between positive body image and depression, self-esteem, dieting behaviors, and drive for muscularity. Positive body image was significantly associated with fewer depressive symptoms (p ≤ .001), higher self-esteem (p ≤ .05), fewer unhealthy dieting behavior (p ≤ .01), and lower drive for muscularity (p ≤ .001; Gillen, 2015).

Negative body image has received significantly more attention than positive body image in research and clinical settings, partly due to its association with adverse health
outcomes. Adverse outcomes of negative body image include disordered eating \((p \leq .05;\) Stice, 2002), depression (Gillen, 2015), and poor self-esteem \((p \leq .001;\) Quick & Byrd-Bredbenner, 2014). For example, one study compared the body image of depressed \((n=35)\) and non-depressed \((n=42)\) participants. Cross-sectional analyses demonstrated that the depressed group was significantly less satisfied with their overall appearance \((p \leq .001)\), less satisfied with their body parts \((p \leq .0001)\), and viewed themselves as less physically attractive \((p \leq .05)\) than the non-depressed group. Additionally, Western women are particularly susceptible to negative body image and associated outcomes (Cash & Grasso, 2005; Cash et al., 2004). Sociocultural body image standards (e.g. media influence) and interpersonal factors (e.g. pressure from friends) contribute to the prevalence of negative body image and distortion in the way one perceives his or her body (Rucker & Cash, 1992; Shroff et al., 2009).

Another measure of body image is body image discrepancy (BID), a combination of perceptual and affective body image assessments. BID is calculated with questions taken from the aforementioned Figure Rating Scale (Stunkard et al., 1983) regarding participants’ perceived current and ideal size. The difference between current body image and ideal body image determines whether the respondent believes her current body is larger or smaller than ideal. Higher BID scores indicate a larger discrepancy (Banitt et al., 2008; Fitzgibbon et al., 2000). The 9 silhouette scale was previously used as a measure of BID in a sample of 389 women (Fitzgibbon et al., 2000). The study, which sought to examine the relationship between BMI and BID across different ethnic groups, found no significant differences in the proportion of women in each ethnic group reporting BID, but that white women reported BID at lower BMI than their Hispanic and black counterparts (Fitzgibbon et al., 2000).

Another study involving 31 women found that higher BID was associated with higher desired weight loss \((p \leq .05)\), higher anxiety scores \((p \leq .01)\), and higher depression scores \((p \leq .05,\) Carroll et al., 2007). The discrepancy between individuals’ current and ideal body size is used as an index of dissatisfaction (Shroff et al., 2009). This dissatisfaction affects women’s self-esteem and subsequent weight management behaviors (Banitt et al., 2008; Fitzgibbon et al., 2000), including the extent to which they honor hunger and satiety cues. As such, BID in particular is a dimension of body image that may play a role in weight loss activities.
Present Study

Although some dimensions of body image (e.g. body avoidance, body appreciation) have been studied in association with intuitive eating, the association between BID and intuitive eating has not been studied. Research shows that body image influences weight management and that it is associated with disordered eating (Harring et al., 2010). How women see and feel about their bodies predicts how they will respond to weight change and weight control (Fitzgibbon et al., 2000; Rucker & Cash, 1992). The current study examines the relationship between BID and intuitive eating, controlling for the potential confounder of BMI. The study hypothesized that women with greater BID would be less likely to eat intuitively. Study analyses also examined the relationship between BID and each independent intuitive eating component. In addition, exploratory analyses examined the relationship between healthy-ideal discrepancy (HID), a different dimension of body image, and intuitive eating. The difference between healthy and ideal body image determines whether the respondent believes an ideal size is larger or smaller than healthy. Evaluation of this discrepancy draws attention to the different influences created by one’s perception of a healthy size vs. an ideal size. Uncovering the relationship between BID and HID with intuitive eating can contribute to a more complete understanding of the relationship between body image as a multidimensional concept and intuitive eating. This may ultimately have implications for research on eating behavior.
CHAPTER 3

METHODS

STUDY DESIGN

The current study draws from the parent study, “Be In Tune with your Eating” (BITE). BITE is an Intuitive Eating randomized control trial for female freshmen at San Diego State University (SDSU). This study used BITE baseline data for cross-sectional analyses. Prior to data collection, all BITE methods were approved by SDSU’s Institutional Review Board.

RECRUITMENT OF SAMPLE

Forty-four female undergraduate freshmen at SDSU were enrolled as participants in BITE. BITE recruited a sample of females using a variety of recruitment methods including flyers and word-of-mouth during on-campus orientation, near residence halls and dining areas, and through collaboration with SDSU’s Health Promotion office. Recruitment lasted approximately 2 weeks in September 2014. Inclusion criteria included: being female, age 18 or older, first year undergraduate student at SDSU, plan to remain in the area for at least 6 months after baseline assessment, not currently pregnant (self-report), and not diagnosed with an eating disorder (self-report). Participants provided consent for eligibility screening for the aforementioned criteria. Participants were also asked for their telephone numbers and email addresses in addition to their preferred form of communication (phone call, text message, or email). Research assistants then contacted participants via their preferred method. Eligible women who confirmed willingness to participate were then enrolled as study participants and completed baseline measurements.
MEASUREMENTS

BITE measurements included a survey and anthropometric measurements. The survey was composed of multiple scales, including the Intuitive Eating Scale-2 (Tylka & Kroon Van Diest, 2013), a Figure Rating Scale (Stunkard et al., 1983) to assess body image discrepancy, and demographics questions. Anthropometric measures included weight (kg) and height (cm), which were used to calculate participants’ BMI.

The Intuitive Eating Scale-2 (IES-2), the second version of the original Intuitive Eating Scale (IES), measures individuals’ level of intuitive eating behavior and the degree to which they honor physical hunger and satiety cues. It is a 23-question scale with response options on a 5-point Likert-type scale (strongly disagree = 1, disagree = 2, neutral = 3, agree = 4, strongly agree = 5). Four subscales represented in the IES-2 capture the key components of intuitive eating, including Unconditional Permission to Eat (UPE), Eating for Physical Rather Than Emotional Reasons (EPR), Reliance on Hunger and Satiety Cues (RHSC), and Body-Food Choice Congruence (B-FCC). Three validation studies by Tylka and Kroon Van Diest (2013) demonstrated high internal consistency for the 23-item IES-2 with a Cronbach’s alpha that ranged from .85-.88 in a sample of college women. In addition, each of the four subscales in three samples yielded high alpha coefficients, indicating high levels of internal consistency in this population (Tylka & Kroon Van Diest, 2013).

UPE ($\alpha = .77-.81$) measures individuals’ will to eat when hungry and to not label foods as “good” or “bad,” and is assessed with 6 items (e.g. “I try to avoid certain foods high in fat, carbohydrates, or calories,” Tylka & Kroon Van Diest, 2013). EPR ($\alpha = .92-.93$) measures individuals’ motivation for eating—whether they are eating in response to physical hunger or for other reasons such as boredom or loneliness, and is assessed with 8 items (e.g. “I find myself eating when I’m feeling emotional [e.g. anxious, depressed, sad], even when I’m not physically hungry,”; Tylka & Kroon Van Diest, 2013). RHSC ($\alpha = .85-.88$) measures individuals’ trust in and reliance on hunger and satiety cues to guide eating behavior. It is assessed with 6 items (e.g. “I trust my body to tell me when to eat,”; Tylka & Kroon Van Diest, 2013). Finally, B-FCC ($\alpha = .86-.87$) measures the extent to which individuals choose food based on their bodies’ needs. It is assessed with 3 items (e.g. “I mostly eat foods that make by body perform efficiently [well],”; Tylka & Kroon Van Diest, 2013). Additionally,
reverse coding was retained for intuitive eating questions posed in the negative direction (“When I am bored, I do NOT eat just for something to do,” “When I am lonely, I do NOT find myself turning to food for comfort,” and I do NOT follow eating rules or dieting plans that dictate what, when and/or how much to eat”). The current study used IES-2 scores on a continuous scale, which averaged the four intuitive eating subscales that make up the total intuitive eating score. A Cronbach’s alpha test was conducted for the IES-2. The Cronbach’s alpha was .804, indicating a high level of internal consistency among the study sample, consistent with previous validation studies found in the literature (Tylka & Kroon Van Diest, 2013).

The Figure Rating Scale (also called Stunkard Body Silhouettes) was used to calculate BID. The scale contains nine female figures labeled 1 through 9, with 1 representing the most slender figure and 9 representing the heaviest figure (Stunkard et al., 1983). Participants select a figure to answer questions “Which figure represents your current size?” and “Which figure represents your ideal size?” A BID score is calculated by subtracting participants’ selected ideal body size from selected current body size. If a participant cannot decide between two figures (e.g. believes that her current size is between figures 4 and 5), her two answers are averaged (e.g. current size of 4.5). A study involving college women (n=146) demonstrated a strong correlation between body dissatisfaction and current minus ideal figure ratings (r = .62, p ≤ .001; Thompson & Altabe, 1991). A participant who believes that her current body is larger than ideal has a BID > 0, a participant who believes that her current body is smaller than ideal has a BID < 0, and a participant who believes that her current and ideal body sizes are the same has a BID = 0 (Banitt et al., 2008; Fitzgibbon et al., 2000).

As an exploratory variable, healthy-ideal discrepancy (HID) was also considered as a different dimension of body image. To determine a participant’s healthy size, participants selected a figure on the Figure Rating scale to answer the question “Which figure best represents a healthy figure?” Taken from BID guidelines, HID is calculated by subtracting participants’ selected ideal body size from selected healthy body size (Banitt et al., 2008; Fitzgibbon et al., 2000). A participant who believes that a healthy body is larger than ideal has a HID > 0, a participant who believes that a healthy body is smaller than ideal has a HID
< 0, and a participant who believes that healthy and ideal body sizes are the same has a HID = 0 (Banitt et al., 2008; Fitzgibbon et al., 2000).

The BITE survey also included demographics questions including age, marital status, health status, and race/ethnicity. Race/ethnicity response options included: non-Hispanic White, Hispanic White, Non-Hispanic Black or African American, Hispanic Black or African American, Native American or American Indian, Asian/Pacific Islander, other, don’t know, or refused to answer.

BMI was calculated as weight (kg) divided by height (cm) squared, and was used as a measure of body composition. Based on NHANES protocols, each measurement was taken two times (National Health and Nutrition Examination Survey, 2002). Weight was taken with a digital weight scale and height was taken with a Shorr Height board. Measurement protocols were provided to each of the research assistants. Protocols outlined steps for preparing participants for measurements, as well as instructions for how to administer each of the measurements. Research assistants were required to read measurement protocols and attend a two-hour training session. Training involved a verbal review of protocols by the project manager and principal investigator, and research assistants practiced conducting each of the measurements and recording results on data sheets identical to those that were used during participant measurements. After practicing 6-8 times for each measurement, the project manager and principal investigator checked answers for accuracy. The acceptable level of difference was <0.5 kg between weight measures and <0.1cm for height measures. If measures in training or during data collection yielded greater than acceptable differences, research assistants repeated measurements until two consecutive measures were within acceptable ranges.

**PROCEDURES**

The baseline evaluation protocol was completed in student dormitories or at SDSU Student Health Services, depending on participants’ preference. The survey was available in English only, was self-administered, and took approximately 40-60 minutes to complete. Participants took the survey either before or after completing anthropometric measures, and research assistants verified that all questions had been answered. Study participants were given $25 for completing the baseline evaluation protocol.
DATA ANALYSIS

The primary study hypothesis was that women with greater BID would be less likely to eat intuitively. The dependent variable in this study was intuitive eating (overall score), and the independent variable was BID. BMI was considered as a potential confounder. Given that the inclusion/exclusion criteria resulted in an otherwise homogenous sample on sex, age, and year in school, no additional variables were controlled for. Statistics software SPSS Version 21.0 was used to perform all data analyses. A Shapiro-Wilk test was conducted to determine normality for the dependent variable intuitive eating. Data were considered normal at p = .867. Simple linear regression analyses were run between BMI, BID, and intuitive eating to determine whether analyses needed to control for BMI when testing the relationship between BID and intuitive eating. A multiple linear regression was then run controlling for identified confounders to examine the independent association between BID and intuitive eating.

Study analyses also examined the relationship between BID and each independent intuitive eating component using simple linear regression. Multiple linear regressions were then run controlling for BMI to examine the independent associations between BID and each independent intuitive eating component identified as significant in the bivariate analyses.

In addition, exploratory analyses examined the relationship between healthy-ideal discrepancy (HID) and intuitive eating. Simple linear regression analyses were run between BMI, HID, and intuitive eating to determine whether to control for BMI when testing the relationship between HID and intuitive eating. A multiple linear regression was then run controlling for identified confounders to examine the independent association between HID and intuitive eating.
CHAPTER 4

RESULTS

RECRUITMENT

All participants were female students at San Diego State University. Of the 104 women recruited for BITE, 2 women were considered ineligible, 12 refused, and 46 did not respond to phone calls or emails. Thus, 44 (42.3%) women comprised the final sample and were included in the current study.

DEMOGRAPHICS

Table 1 shows the demographic distribution of the 44 women. The sample was homogenous with respect to age (18) and marital status (single), but differed with respect to race/ethnicity and BMI. The majority of participants (55.8%, n=24) identified themselves as non-Hispanic white. The remaining participants identified themselves as follows: 16.3% (n=7) as Hispanic white, 7% (n=3) as non-Hispanic black or African American, 7% (n=3) as Asian or Pacific Islander, 4.7% (n=2) as Hispanic black or African American, 2.3% (n=1) as Native American or American Indian, and 7% (n=3) as other. One person refused to answer this question. The majority of participants (72.7%. n=32) were classified as healthy weight (BMI 18.5-24.9) according to The World Health Organization (WHO) guidelines. The remaining participants were classified as follows: 2.3% (n=1) as underweight (BMI < 18.5), 15.9% (n=7) as overweight (BMI 25.0-29.9), and 6.8% (n=3) as obese (BMI > 30).
Table 1. Sample Demographics

<table>
<thead>
<tr>
<th>Sample demographics (N=44)</th>
<th>n (%) or mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 18</td>
<td>44 (100%)</td>
</tr>
<tr>
<td>Freshman</td>
<td>44 (100%)</td>
</tr>
<tr>
<td>Single</td>
<td>44 (100%)</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>24 (54.5%)</td>
</tr>
<tr>
<td>Hispanic White</td>
<td>7 (15.9%)</td>
</tr>
<tr>
<td>Non-Hispanic Black/African American</td>
<td>3 (6.8%)</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>Hispanic Black/African American</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Native American/American Indian</td>
<td>3 (6.8%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Refused</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>23.5 (4.4)</td>
</tr>
<tr>
<td>Underweight</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Healthy Weight</td>
<td>32 (72.7%)</td>
</tr>
<tr>
<td>Overweight</td>
<td>7 (15.9%)</td>
</tr>
<tr>
<td>Obese</td>
<td>3 (6.8%)</td>
</tr>
</tbody>
</table>

**Body Silhouettes**

Selected current body sizes ranged from 2-7 (Mean = 4.1, SD = 1.1), with higher numbers representing larger figures. The majority of women (61.4%, n=27) selected figures 4 or 5. Selected ideal body sizes ranged from 2-5 (Mean = 3.1, SD = .78). Fifty percent (n=22) of women selected figure 3 as an ideal body size. Selected healthy body sizes ranged from 2-4 (Mean = 3.3, SD = .67). Most women (84.0%, n=37) selected figures 3 or 4 as the healthiest body size. In general, a greater percentage of women selected larger figures for current than for ideal or healthy. See Figures 2, 3, and 4 for responses.

**Body Image Discrepancy**

Body image discrepancy (BID), computed by subtracting the woman’s ideal body size from her current body size, ranged from -1 to 4 (Mean = 1.0, SD = .98). Twenty three percent (n=10) of women reported no BID, selecting the same figure for ideal and current body size. Additionally, 4.5% (n=2) of women reported BID of -1, selecting an ideal figure larger than their current figure. All other women (72.7%, n=32) reported BID ranging from .5 to 4, selecting an ideal figure smaller than their current figure. See Table 2 for BID scores.
Figure 2. Current body silhouette responses (N=44).
Figure 3. Ideal body silhouette responses (N=44).
Figure 4. Healthy body silhouette responses (N=44).
Table 2. BID Scores

<table>
<thead>
<tr>
<th>BID Scores (N=44)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current &lt; Ideal</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>Current = Ideal</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>10 (22.7%)</td>
</tr>
<tr>
<td>Current &gt; Ideal</td>
<td></td>
</tr>
<tr>
<td>.5</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>1</td>
<td>18 (40.9%)</td>
</tr>
<tr>
<td>1.5</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>2</td>
<td>10 (22.7%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>4</td>
<td>1 (2.3%)</td>
</tr>
</tbody>
</table>

**INTUITIVE EATING**

Overall intuitive eating scores from the IES-2 ranged from 2.58-4.29 (Mean = 3.4, SD = .39). The overall IES-2 scores are computed from the mean IES-2 factor 1-4 scores. Factor 1 scores, which represent unconditional permission to eat, ranged from 1.88-4.63 (Mean = 3.3, SD = .72). Factor 2 scores represent eating for physical rather than emotional reasons, and ranged from 1.67-5.0 (Mean = 3.1, SD = .66). Factor 3 scores represent reliance on hunger and satiety cues, and ranged from 1.67-4.83 (Mean = 3.5, SD = .63). Factor 4 scores represent body-food choice congruence, and ranged from 2.0-5.0 (Mean = 3.7, SD = .82).

Although the IES-2 does not assign a hard cutoff on which to define intuitive vs. non-intuitive behaviors, scores above 3.5 are generally considered intuitive. Tylka and Kroon Van Diest (2013) reported IES-2 scores among men and women. Men were considered more intuitive than women, with scores above 3.5. As such, the current sample overall approaches intuitive eating behaviors with an average IES-2 score of 3.4.

**ASSOCIATION BETWEEN BID AND INTUITIVE EATING**

Prior to testing the study hypothesis, a simple linear regression was run to determine whether there was an association between BMI and intuitive eating, requiring it to be controlled for in the analyses. BMI was statistically significantly associated with intuitive eating score, F(1, 42) = 13.3, p ≤ .05; R² = 0.24. For every 1-unit increase in BMI, intuitive eating decreased by .04. Another simple linear regression was run to determine whether there was an association between BMI and BID. BMI was statistically significantly associated with
BID, \( F(1, 42) = 8.66, p \leq .01; R^2 = .17 \). For every 1-unit increase in BMI, BID increased by .09.

Thus, a multiple linear regression was run using BID, controlling for BMI, to determine whether it is associated with intuitive eating. The overall model was statistically significant, \( F(2, 41) = 9.8, p \leq .001 \); adjusted \( R^2 = .29 \). After controlling for BMI, for every 1-unit increase in BID, intuitive eating decreased by .13, \( p \leq .05 \).

**ASSOCIATION BETWEEN BID AND EACH INDEPENDENT INTUITIVE EATING COMPONENT**

In order to identify confounders, simple linear regressions were run between BMI and IES-2 Factors 1 through 4. BMI was statistically significantly associated with Unconditional Permission to Eat (UPE), \( F(1,42) = 4.5, p \leq .05; R^2 = .10 \). For every 1-unit increase in BMI, UPE decreased by .05. BMI was also statistically significantly associated with Reliance on Hunger and Satiety Cues (RHSC), \( F(1,42) = 7.9, p \leq .05; R^2 = .16 \). For every 1-unit increase in BMI, RHSC decreased by .06. BMI was statistically not significantly associated with Eating for Physical Rather than Emotional Reasons (n.s.) or with Body-Food Choice Congruence (n.s.).

Before confounders were identified, simple linear regressions were run between BID and IES-2 Factors 1 through 4 to determine whether there were associations between them. BID was statistically significantly associated with Unconditional Permission to Eat (UPE), \( F(1,42) = 14.0, p \leq .001; R^2 = .25 \). For every 1-unit increase in BID, UPE decreased by .37. BID was statistically significantly associated with Reliance on Hunger and Satiety Cues (RHSC), \( F(1,42) = 9.9, p \leq .05; R^2 = .19 \). For every 1-unit increase in BID, RHSC decreased by .28. BID was not associated with Eating for Physical Rather than Emotional Reasons (n.s.), or with Body-Food Choice Congruence (n.s.).

Multiple linear regressions were run between BID and IES-2 Factors 1 and 3, controlling for BMI, to determine their independent associations. The overall model of BID, BMI, and Unconditional Permission to Eat (UPE) was statistically significant, \( F(2, 41) = 7.3, p \leq .05; \text{adjusted } R^2 = .23 \). After controlling for BMI, for every 1-unit increase in BID, UPE decreased by .33, \( p \leq .05 \). The overall model of BID, BMI, and Reliance on Hunger and
Satiety Cues (RHSC) was statistically significant, $F(2, 41) = 6.8$, $p \leq .05$; adjusted $R^2 = .21$. After controlling for BMI, for every 1-unit increase in BID, RHSC decreased by .21, $p \leq .05$. 

**Association Between HID and Intuitive Eating**

A simple linear regression was run to determine whether there was an association between BMI and HID. BMI was statistically significantly associated with HID, $F(1, 42) = 4.2$, $p \leq .05$; $R^2 = .09$. For every 1-unit increase in BMI, HID decreased by .04.

Before confounders were identified, a simple linear regression was run to determine whether there was an association between HID and intuitive eating. HID was not statistically significantly associated with intuitive eating (n.s.).
CHAPTER 5

DISCUSSION

In light of the adverse health outcomes associated with weight gain and subsequent dieting both prevalent among the U.S. female college population (Desai et al., 2008), intuitive eating is a desirable alternative. Intuitive eating promotes healthy behaviors (e.g. choosing foods based on bodies’ needs) and is associated with improved physical and psychological health (Bacon et al., 2002; Bacon et al., 2005; Carroll et al., 2007; Ciampolini et al., 2010; Cole & Horacek, 2010; Gagnon-Girouard et al., 2010; Provencher et al., 2007; Timmerman & Brown, 2012). Healthy body image also appears to be an important factor for physical and psychological health (Banitt et al., 2008). Body image and intuitive eating have been shown to be associated in previous research, which yields important questions about the effectiveness of alternative weight management and associated psychological outcomes such as acceptance of one’s size (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Bacon et al., 2005; Schoenefeld & Webb, 2013; Van Dyke & Drinkwater, 2013). Body image is a multidimensional concept that has been defined and measured in many different ways (Cash & Fleming, 2002; Cash et al., 2004). BID is one dimension of body image that has not been studied in association with intuitive eating. Thus, the main objective of the present study was to assess the relationship between BID and intuitive eating. BID is an important body image dimension due to its association with body image dissatisfaction, which can affect self-esteem, eating behavior, and weight management (Banitt et al., 2008). Given the prevalence of overweight and obesity in U.S. women and of the role BID and intuitive eating might play in weight management, it is important to understand the relationship between BID and intuitive eating.

Overall, analyses supported the study hypothesis that greater body image discrepancy was negatively associated with intuitive eating. Participants who believed that their current bodies were much larger than ideal were less likely to honor their bodies’ hunger and satiety
cues than participants who expressed less or no discrepancy between their current and ideal sizes. BMI confounded the relationship between BID and intuitive eating. Those with larger BMIs expressed a greater discrepancy between their current and ideal sizes and were more likely to eat for emotional, environmental, or social reasons. When controlling for BMI, the independent relationship between BID and intuitive eating remained significant. These relationships are consistent with other body image and intuitive eating findings. In general, intuitive eating has been found to be positively associated with positive dimensions of body image (e.g. as body appreciation increases, intuitive eating increases) and negatively associated with negative dimensions of body image (e.g. as body shame increases, intuitive eating decreases; Van Dyke & Drinkwater, 2013). Study results reinforce these patterns in that BID, a negative dimension of body image, has been shown to be negatively associated with intuitive eating.

When testing the relationship between BID and independent intuitive eating factor scores, significant linear relationships were found only with IES-2 factors 1 and 3, Unconditional Permission to Eat and Reliance on Hunger and Satiety Cues. Participants who believed that their current bodies were much larger than ideal were less likely to grant themselves unconditional permission to eat or respond to hunger and satiety cues than participants who expressed less or no discrepancy between their current and ideal sizes. However, while intuitive eating is composed of separate subscales, it should not be represented by any of the one subscales alone.

No significant linear relationship was found between HID and intuitive eating. However, a significant relationship was found between BMI and HID. Smaller BMIs were associated with greater HID. Women with lower BMIs were more likely to report a discrepancy between healthy and ideal sizes.

The relationship between BID and intuitive eating was found to be significant while the relationship between HID and intuitive eating was not. With respect to intuitive eating, the difference between current and ideal sizes appears to be more influential than the difference between healthy and ideal sizes. This reinforces the importance of studying BID and intuitive eating. BID was computed from the difference current and ideal sizes whereas HID was computed from the difference between healthy and ideal sizes. This suggests that there is an important difference between ideal and healthy conceptualizations among the
study population. Mass media are a known contributor of negative body image though idealization of thinness (Madanat et al., 2011) and has been shown to influence women’s eating behavior (Groesz et al., 2002). It perpetuates a cultural preoccupation with ideal, rather than healthy, weight and size (Dunkley et al., 2001; Quick & Byrd-Bredbenner, 2014), which is perhaps a powerful predictor on eating behavior. This sample may represent women that place greater importance on achieving a certain physical standard.

**LIMITATIONS**

While study analyses uncovered several significant associations, the cross-sectional research design cannot infer cause and effect relationships among them. Findings are additionally limited by the use of convenience sampling and small sample size, resulting in a study that may be internally, but not externally, valid. Selection bias may have resulted in a sample that is not representative of all SDSU freshman women or of all female college students. Specifically, inclusion criteria generated a sample that was homogenous with respect to sex, age, and year in school. Additionally, recruitment locations near residence halls and dining areas generated a sample of students living only on SDSU campus, who may differ from commuter students across characteristics such as eating behavior. Also, differences between racial/ethnic groups were not examined. Although past research on intuitive eating has highlighted important differences between races/cultures with respect to eating behavior, insufficient variance among the study sample prevented these analyses. Finally, 72.7% of sample participants classified as healthy weight, far surpassing the national average (Harring et al., 2010; Holm-Denoma et al., 2008; Wengreen & Moncur, 2009), making results difficult to generalize. This limitation was addressed statistically by controlling for BMI. Despite this limitation, BMI still played an important role in understanding intuitive eating.

**STRENGTHS**

Because the relationship between BID and intuitive eating has not been researched, this study fills a gap. In addition, this study used the IES-2 and Body Image silhouettes, both validated scales. Also, despite the small sample size, BID and intuitive eating scores were consistent with other similar samples, making this study somewhat generalizable. Studies
measuring BID with a Figure Rating Scale resulted in average BID scores of 1.6 (SD = 3.0) in adolescent girls (Banitt et al., 2008), 1.2 (SD = 1.4) in adult women (Fitzgibbon et al., 2000), and .86 (SD = .84) in college women (Fallen & Rozin, 1985). While BID scores varied across different samples, current study scores (Mean = 1.0, SD = .98) are within previously established ranges. Four intuitive eating studies with college women yielded overall intuitive eating scores of 3.2 (SD = .57; Augustus-Horvath & Tylka, 2011), 3.4 (SD = .51), 3.4 (SD = .51), and 3.4 (SD = .48; Tylka & Kroon Van Diest, 2013), each consistent with current study intuitive eating scores (Mean = 3.4; SD = .39). With respect to intuitive eating, the current study sample appears to be representative of college women overall.

**Implications for Future Research**

Study results point to the need for future research with a larger and more representative sample. Future studies should include participants of different ages and students living off campus to capture a more representative college population. In addition, although an association between BID and intuitive eating has been established, future studies should determine the causal relationship between the two variables. Indeed, whereas many health outcomes of intuitive eating have been studied, little research has explored the predictors of intuitive eating. Because intuitive eating yields positive health outcomes, it is important to consider how interventions may increase intuitive eating behaviors.

Uncovering a relationship between BID and intuitive eating may yield important implications for future weight management interventions. Women who experience higher BID or view themselves as larger than ideal are more susceptible to restrictive eating. These women should be targeted, perhaps through observation of restrictive eating in dining halls and restaurants, in future weight management interventions to avoid the negative physical and psychological health outcomes of such dieting behavior. If future studies establish a causal relationship between BID and intuitive eating such that BID predicts eating behavior, programs focusing on increasing approval of the body and rejecting thin ideals should be established. Finally, the Acceptance Model of Intuitive Eating represents only one dimension of body image, body acceptance. The model should be expanded to include other dimensions of body image including BID for a more complete representation of the relationship between body image overall and intuitive eating.
REFERENCES


