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PSYCHOLOGICALLY HEALTHY EATING AND NUTRITIONALLY HEALTHY EATING: EXPLORING A TWO-FACTOR THEORY OF HEALTHY EATING

by

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M.S., Psychology, University of New Mexico

DISSERTATION

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Abstract

Background: While much research has investigated disordered eating, obesity, and weight loss treatments, less work has focused on creating a positive definition of psychologically healthy eating. Such a definition could inform obesity and eating disorder treatments. While intuitive eating appears to approximate a definition of psychologically healthy eating, it was believed that adding concepts of moderation, flexibility, and food enjoyment would improve its construct validity, as previous research has supported these constructs as important for psychologically healthy eating. The current paper presents a two-factor model of healthy eating, one that incorporates both psychologically healthy and nutritionally healthy eating. **Method:** A total of 479 undergraduate students completed online measures of nutritionally healthy eating, intuitive eating, moderation, flexibility, food enjoyment, emotional eating, hedonic hunger, dieting, body dissatisfaction, disordered eating, psychological health, ethnic identity, and demographics. **Results:** Factor analyses indicated that the items assessing moderation, flexibility, and food enjoyment were psychometrically problematic, and so analyses proceeded with the measure of intuitive eating alone. Nutritionally healthy eating and psychologically healthy eating were orthogonal. A latent profile analysis was

conducted using measures of nutritionally healthy and psychologically healthy eating as indicators; this resulted in a five-class solution including Healthy, Dieting, Non-dieting, Intuitive Eating, and Unhealthy classes. These classes were theoretically meaningful and showed distinct patterns when compared on other study measures. **Discussion:** Intuitive Eating appears to provide a valid operationalization of psychologically healthy eating. Results generally supported the two-factor theory of healthy eating. Future research should investigate the effectiveness of intuitive eating interventions to improve public health as well as weight loss and eating disorder treatments.

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Chapter 1

Psychologically Healthy Eating and Nutritionally Healthy Eating: Exploring a Two-Factor Theory of Healthy Eating

Overview and Purpose of the Study

Although there is a vast literature on the causes and treatment of obesity and eating disorders (Ogden, 2011; Sweeting, 2008), there has been relatively little effort devoted to defining healthy eating from a psychological perspective. It is well-known that obesity treatments have limited success in the long-term (Moldovan & David, 2011), and treatments for eating disorders are generally effective for only about 50% of clients (Wilson, Grilo, & Vitousek, 2007). A specific definition of psychologically healthy eating could inform the theory and treatment of both obesity and eating disorders, as it would provide specific treatment goals and strategies and potentially offer ways to increase the effectiveness of these treatments. Such a definition would have potential applications for other fields as well. Positive psychology argues that psychologists should be concerned with studying those positive/healthy aspects of human psychology rather than focusing solely on treating mental illness (Seligman & Csikszentmihalyi, 2000); a definition of healthy eating is in line with this position. The benefits of a psychological definition of healthy eating would therefore not be restricted to individuals with disordered eating, but could be used to improve the eating habits of the public in general.

There are several lines of research in psychology that provide insight into what might be included in such a definition. For example, research on weight loss, disordered eating and dieting can help clarify how healthy eating should be defined. The research

from these areas converges in multiple ways, providing a theoretical background from which hypotheses about the nature of healthy eating are made. Specifically, I argue for a two-factor definition of healthy eating, with the first factor consisting of healthy dietary content, as defined by the field of nutrition, and the second factor consisting of a healthy eating process, as explored in this paper.

The remainder of this study aims to develop a definition of psychologically healthy eating, and to provide an evidence base for making hypotheses regarding both psychologically healthy eating and nutritionally healthy eating. For example, I expected that healthy eating process would be negatively correlated with disordered eating, body dissatisfaction, Body Mass Index (BMI; kg/m^2), unhealthy dieting techniques, emotional eating, and hedonic hunger (i.e., hunger driven by environmental cues). In addition, I expected that healthy eating content would be correlated with a lower BMI. I also expected that the two different factors, eating content and eating process, would result in four different groups. I tested these hypotheses by measuring nutritionally and psychologically healthy eating among a sample of college students and performing correlational analyses to test whether the expected relationships between variables resulted. I then conducted a latent profile analysis to determine whether the four hypothesized groups emerged.

Nutritionally Healthy Eating

Guidelines. Guidelines for healthy eating derived from the nutrition field provide some general dietary recommendations. These recommendations revolve around specific types of macronutrients, namely fat, carbohydrates, and protein. The current guideline for fat consumption states that healthy adults should consume 20-35% of their calories

from fat (United States Department of Agriculture & United States Department of Health and Human Services, 2010). One type of fat, trans fat, is predominantly found in margarine and deep-fried fast foods (Skerrett & Willett, 2010; Uauy et al., 2009). Saturated fats, on the other hand, are primarily found in red meat and dairy products (Skerrett & Willett, 2010). Current recommendations are to avoid trans fat as much as possible, and to moderate saturated fat intake to less than 10% of total calories (Skerrett & Willett, 2010; Uauy et al., 2009). The remainder of one's fat intake should come from unsaturated fats, especially monounsaturated fats, which are categorically considered healthy (American Heart Association, 2012). Unsaturated fats are found in vegetable oils, nuts, whole grains, and fish (Skerrett & Willett, 2010).

Carbohydrates are typically discussed in terms of components: fiber, sugar, and starch. Fiber is primarily found in unprocessed foods including fruits and vegetables, legumes, and whole grains (Mudgil & Barak, 2013). There is a strong consensus indicating that higher fiber intake is associated with lower rates of disease, including gastrointestinal and cardiovascular disease (Mudgil & Barak, 2013). With regard to sugar and starch, it is often easier to discuss specific food sources rather than general recommendations. Specifically, ingesting fructose and starch from fruits and vegetables, legumes, and whole grains is considered healthy, whereas ingesting added sugars and high fructose corn syrup found in highly refined foods and beverages such as soda, candy, and refined grains is not (AHA, 2015). Current guidelines suggest that 45-65% of calorie intake should come from carbohydrates, and that added sugars should be limited to six to nine teaspoons per day (AHA, 2015; USDA & USDHHS, 2010).

Animal products, legumes, and nuts are good sources of dietary protein (Skerrett & Willett, 2010). The current recommendation is to consume 10-35% of calories from protein (USDA & USDHHS, 2010). A new addition to the guidelines recommends that 20% of protein intake, or about eight ounces per week, come from fatty fish due to its high content of healthy omega-3 fatty acids (USDA & USDHHS, 2010). The remaining 80% of protein intake should come from a variety of sources consisting mainly of lean meat, fish and poultry, legumes, eggs, and nuts (Halton et al., 2006; USDA & USDHHS, 2010).

Measurement. The most common measures of nutritionally healthy eating are food frequency questionnaires (FFQ), which provide participants with a list of different foods, and ask them to indicate how frequently they have eaten those foods within a given time period (Cade, Thompson, Burley, & Warm, 2002). FFQs have been criticized on the grounds that they are subject to desirability effects in reporting, and some researchers have suggested that scores might be best interpreted as representing each individual's subjective perception of his or her diet, as opposed to an objective measure of diet quality, due to the fact that they depend on memory (Caan et al., 1998; Drewnowski, 2001). Other individuals in the field have suggested that 24-hour food recalls might be more accurate than FFQs (Kristal, Peters, & Potter, 2005). As the name implies, 24-hour recalls prompt participants to retrospectively report the foods they ate in the past 24 hours. Often, multiple 24-hour recalls are averaged in order to gain a better understanding of usual dietary intake (Zimmerman et al., 2009).

The method of assessing dietary data used in this study was the Healthy Eating Index (HEI). The HEI was developed by the Center for Nutrition Policy and Promotion

to convert dietary information collected using FFQs or 24-hour recalls into an overall scale that assesses compliance with federal guidelines for healthy eating. The scale ranges from 0 to 100, with higher scores indicating better dietary quality (Kennedy, Ohls, Carlson, & Fleming, 1995). The HEI-2010 is the most recent version of the HEI, and it is comprised of 12 subscales that correspond with different dietary elements (Guenther et al., 2013, 2010). It has been shown to be negatively associated with abdominal obesity (Tande, Magel, & Strand, 2010) and with various health outcomes (Dehghan et al., 2012; Yusof, Isa, & Shah, 2012).

Ethnic and gender differences. Research indicates that there may be ethnic differences in healthy eating. One study found that Hispanic participants scored higher than Caucasians on the HEI (Hiza, Casavale, Guenther, & Davis, 2013), but another found no differences between Caucasian and Hispanic participants (Forshee & Storey, 2006). Other research has concluded that less acculturated Hispanics score significantly higher on the HEI than Caucasians, indicating better diet quality, whereas more acculturated Hispanics score similarly to or lower than Caucasians (Aldrich & Variyam, 2000; Guendelman & Abrams, 1995). This indicates that acculturation level may explain the discrepancies in the literature, and that it may be important to take into account level of acculturation when investigating ethnic differences in diet quality. Research also indicates that women consistently score higher than men on measures of dietary quality (Ervin, 2011; Forshee & Storey, 2006; Hiza et al., 2013).

Psychologically Healthy Eating

Intuitive Eating. The construct of intuitive eating can be conceptualized as an initial attempt to define healthy eating from a psychological perspective. Intuitive eating

is thought to consist of four main characteristics: 1) giving oneself unconditional permission to eat until satiated; 2) eating for physiological reasons rather than emotional ones; 3) eating in response to hunger and satiety; and 4) choosing nutritious foods that match the needs of one's body (Tylka & Wilcox, 2006). Indeed, a measure of intuitive eating was found to correlate positively with a measure of psychological well-being and negatively with measures of disordered eating (Tylka, 2006).

Notably, intuitive eating primarily appears to be concerned with eating as a *process*. Arguably the most controversial aspect of intuitive eating is its tenet of "unconditional permission" to eat as much food of any type as desired. This is in direct opposition to the nutritional definition of healthy eating, which stresses the importance of eating certain foods sparingly or not at all (Skerrett & Willett, 2010). Regardless, intuitive eating's conceptualization of eating as a process that relies primarily on internal as opposed to external cues seems to be an important aspect of healthy eating. According to the authors of the instrument, other essential components of intuitive eating include the ability to eat when hungry, to stop when satiated, and to refrain from using food to regulate emotions. These aspects of the intuitive eating approach are fundamentally important when discussing the construct of healthy eating.

Ethnic and gender differences in intuitive eating. The research on intuitive eating is relatively young, yet there is evidence that men report higher levels of intuitive eating than women (Camilleri et al., 2015; Tylka & Kroon Van Diest, 2013). Additionally, although one study found few differences between racial groups in rates of endorsement of two items relating to intuitive eating (Denny, Loth, Eisenberg, & Neumark-Sztainer, 2013), there is very little research on ethnic differences in intuitive

eating. Therefore, further investigation of cultural differences in intuitive eating is warranted.

Correlates of intuitive eating. Researchers have found that intuitive eating is negatively related to BMI, indicating that those with lower BMIs report more intuitive eating (Dockendorff, Petrie, Greenleaf, & Martin, 2012; Tylka, 2006). Intuitive eating is also thought to be negatively associated with body dissatisfaction, thin ideal internalization (the extent to which one accepts the thin ideal as worthy of pursuit; Thompson & Stice, 2001), extreme weight control behaviors, and disordered eating (Denny et al., 2013; Tylka, 2006; Tylka & Wilcox, 2006). Intuitive eating is positively associated with variables relating to psychological health, such as self-esteem, life satisfaction, and adaptive coping strategies (Tylka, 2006).

Hedonic Hunger

The concept of hedonic hunger can be incorporated into the theory of intuitive eating to create a more complete theoretical understanding of psychologically healthy eating. First introduced by Lowe and Levine (2005), hedonic hunger is defined as hunger that is driven primarily by environmental cues, such as the presence of palatable food. In contrast, physiological hunger reflects true calorie deprivation. These researchers theorize that hedonic hunger is a new dimension of appetite brought about by the limitless availability of food in modern day society (Lowe & Butryn, 2007; Lowe & Levine, 2005). Interestingly, they draw the distinction between dieting to control one's hedonic hunger versus dieting to control physiological hunger. Lowe and colleagues believe that weight loss programs are generally associated with positive short-term outcomes because they temporarily help participants resist the impulses of hedonic

hunger, a skill that is adaptive in today's environment where the omnipresence of food has caused dramatic increases in the rates of overweight and obesity. On the other hand, dieting in response to physiological hunger is considered pathological (Lowe & Butryn, 2007).

Intuitive eating emphasizes the importance of not eating in response to external cues, but focuses on just one main type: emotional eating. Although the theory of intuitive eating does not mention hedonic hunger, it is possible to conceptualize hedonic hunger as a different type of external (i.e., non-physiological) hunger cue. The following sections will demonstrate how uniting these two bodies of literature in this way helps synthesize research from obesity and weight loss, disordered eating and its treatments, and dieting. In addition, uniting these two fields of research can help reconcile the differing recommendations from intuitive eating and obesity research regarding unconditional permission to eat. It may be that unconditional permission to eat in response to true physiological hunger is healthy, whereas unconditional permission to eat in response to external hunger cues, such as hedonic hunger, is problematic. Therefore, it may be appropriate to exercise dietary restraint in the presence of external cues.

Weight Loss

The literature on weight loss and obesity can also inform a definition of psychologically healthy eating because it provides guidelines for how to achieve and maintain a healthy weight. Given the evidence that even proportionally small reductions in weight (5-15% of one's body weight) can lead to improvements in cardiovascular health, diabetes, cancer risk, and overall mortality (Birks, Peeters, Backholer, O'Brien, & Brown, 2012; Byers & Sedjo, 2011; Wing et al., 2011), government agencies have

recommended weight loss for overweight and obese individuals (National Heart, Lung, and Blood Institute, 2000; Office of the Surgeon General, 2001). The most common weight loss recommendations center around food and nutrition, with the aim of decreasing caloric intake (USDHHS, 2010).

In addition to dietary weight management strategies that are in line with the nutritional definition of healthy eating, there are a variety of non-dietary suggestions. For example, many weight loss programs recommend eating frequently, a recommendation that has found support in the literature (Bachman, Phelan, Wing, & Raynor, 2011; Leidy & Campbell, 2011). Other common strategies include controlling portion size (Seagle, Strain, Makris, & Reeves, 2009) and eating slowly, due to its association with increased satiety (Spiegel, Wadden, & Foster, 1991). Eating while distracted is specifically discouraged as it may lead to less awareness of satiety and subsequent overeating (Bellisle, Dalix, & Slama, 2004; Brunstrom & Mitchell, 2006).

These weight loss recommendations, which focus on eating as a process, are strikingly consistent with the concepts of intuitive eating and hedonic hunger. All of these weight loss strategies may help participants lose weight (at least in the short term) because they serve to increase awareness of hunger and satiety (physiological hunger). In support of this idea, one weight loss study found that the more its participants utilized weight control behaviors, the less hedonic hunger they reported. In turn, both of these variables were associated with improved weight loss outcomes (O'Neil, Theim, Boeka, Johnson, & Miller-Kovach, 2012). In summary, some weight loss strategies are consistent with the theory of intuitive eating and hedonic hunger.

Disordered Eating

The eating disorders are characterized by extreme forms of eating that are incompatible with healthy eating. For example, clients with anorexia nervosa (AN) and bulimia nervosa (BN) frequently engage in exaggerated and highly unhealthy dietary restriction. In the short term, such restriction usually results in energy and nutrient deficiencies, and can ultimately result in binge eating and preoccupation with food (Polivy, 1996); in the long-term it is associated with cardiac abnormalities, cognitive impairment, and even death (DiVasta et al., 2010; Zakzanis, Campbell, & Polsinelli, 2010). Clearly, these exaggerated patterns of dietary restriction are incompatible with psychologically healthy eating. At the opposite extreme, both binge eating disorder (BED) and BN involve bouts of binge eating. A core component of the eating disorders, this maladaptive behavior is also clearly incompatible with psychologically healthy eating. Thus, psychologically healthy eating is fundamentally in opposition with behaviors such as extreme dietary restriction or binge eating. Instead, it may be that healthy eating is associated with moderation. Indeed, the goal of achieving moderate eating is emphasized in eating disorder treatments as well as in obesity treatments (Fairburn, Cooper, & Shafran, 2003; Freeland-Graves, Nitzke, & Academy of Nutrition and Dietetics, 2013).

In recent years a group of researchers have proposed the existence of a new type of eating disorder termed "orthorexia nervosa" (ON), which they characterize as a rigid, obsessive adherence to a healthy diet that is totally devoid of any food perceived as unhealthy (Donini, Marsili, Graziani, Imbriale, & Cannella, 2004). Additionally, ON is thought to be associated with significant anxiety and distress regarding food (Donini et

al., 2004). Although ON has proven difficult to measure, resulting in questions about the validity of the ON diagnosis (Aksoydan & Camci, 2009; Bosi, Çamur, & Güler, 2007; Fidan, Ertekin, Işikay, & Kirpinar, 2010; Ramacciotti et al., 2011), several important points arise from this discussion. First, the research on ON sends an important message: when taken to an extreme, healthy eating actually can be pathological. Additionally, given the social acceptability of healthy eating, researchers have voiced the concern that truly pathological eating might escape notice if disguised as healthy eating (Donini et al., 2004; Lattimore & Halford, 2003). Thus, it is important to develop a clear understanding of the distinction between eating that is *truly* healthy and eating that is pathological in its rigid adherence to a healthy diet.

Preoccupation with food is a common correlate of disordered eating, as it is a characteristic ascribed to individuals with AN and BN (Sunday, Halmi, & Einhorn, 1995). Along these lines, eating disorder patients are often described as experiencing feelings of anxiety while eating or when in the presence of food (C. M. Webb et al., 2011). In contrast, work on the public's perceptions of healthy eating suggests that healthy eating is associated with positive emotions, such as the ability to enjoy food (e.g., Chapman & Beagan, 2003; House et al., 2006). Thus, the emotional experience of eating might be another way in which healthy eating is distinguished from pathological eating. Whereas disordered eating correlates with negative emotions surrounding eating, healthy eating may be associated with enjoyment.

Lastly, a pattern of rigid inflexibility with regard to eating characterizes AN and ON (Donini et al., 2004; Fairburn, 2008). Thus, psychologically healthy eating should be distinguished by its capacity for flexibility. This idea is consistent with research showing

that individuals with eating disorders show patterns of rigidity on cognitive tasks, whereas healthy controls are characterized by greater flexibility (Tchanturia et al., 2011).

This discussion of disordered eating brought up several characteristics that may be important for a psychological definition of healthy eating. However, these characteristics are not included in the theory of intuitive eating. It was believed that adding in the concepts of moderation, enjoyment, and flexibility to a definition of psychologically healthy eating would improve the construct.

Cognitive Behavior Therapy-Enhanced. A psychological definition of healthy eating could potentially improve the effectiveness of existing treatments for EDs. The predominant treatment approach for eating disorders is a cognitive-behavioral treatment developed by Fairburn et al. (2008) called Cognitive Behavior Therapy-Enhanced (CBT-E). This treatment may have some elements that are consistent with intuitive eating. For example, CBT-E emphasizes restoring regular eating by imposing a meal plan consisting of three meals and two snacks daily. This technique likely is consistent with intuitive eating because it prevents both food restriction and the resulting extreme hunger that is thought to make eating disorder clients more likely to binge. However, it is possible that CBT-E's effectiveness could be improved by an increased focus on psychologically healthy eating and explicit training with regard to a healthy eating process.

Dieting

The question of whether dieting is a type of healthy eating remains controversial. In fact, the very definition of "dieting" is a source of consternation in the field, and it seems that definitions of "dieting" vary from person to person and study to study. Some researchers have determined whether someone was dieting based on their response to a

single question, "Are you currently on a diet to lose weight?" (Timko, Perone, & Crossfield, 2006). For the purposes of this manuscript, "dieting" will be defined as changing one's eating in order to achieve weight loss.

In some studies, dieters reported eating nutritionally healthier foods, leading the researchers to conclude that dieting was a healthy response to an environment in which the limitless availability of food tends to result in obesity (Andreyeva, Long, Henderson, & Grode, 2010; Lattimore & Halford, 2003). Additionally, evidence from some prospective studies indicates that weight loss treatment can actually ameliorate disordered eating symptoms in overweight and obese participants (Dalle Grave, Calugi, Corica, Di Domizio, & Marchesini, 2009; Lattimore & Halford, 2003; National Task Force on the Prevention and Treatment of Obesity, 2000). These studies support the idea that dieting can be a form of healthy eating.

However, other studies have come to a very different conclusion. Some studies found an association between dieting and symptoms of disordered eating (Ackard, Croll, & Kearney-Cooke, 2002; Stice, Marti, & Durant, 2011). Other prospective studies have concluded that dieting is a major risk factor for developing an eating disorder (Neumark-Sztainer et al., 2006; Stice, 2001). These studies indicate that dieting represents an unhealthy form of eating that may put one at risk for disordered eating.

One possible reason for the sharp divide among researchers regarding dieting might have to do with the type of question being posed. To date, researchers have focused on the question of whether dieting is categorically healthy or unhealthy. This question may be misleading, since research generally shows that some dieters engage in healthy eating behaviors, whereas others engage in unhealthy behaviors (Kachi, 2010;

Lowe & Levine, 2005). It may be that the question of *whether* dieting is healthy is overly simplistic. A more useful formulation of the question might be, "*When* is dieting healthy?" A psychological definition of healthy eating based on intuitive eating and hedonic hunger can help answer this question.

One important consideration may be one's motivations for dieting. Dieters who are motivated by appearance reasons are higher in body dissatisfaction and more likely to use unhealthy dieting strategies than women who are dieting for health reasons (Putterman & Linden, 2004). Kachi employed a taxometric analysis to categorize female high school participants into different types of dieters (Kachi, 2010). This study determined that "healthy" dieters, who employed healthy dieting strategies (such as counting calories or avoiding fatty foods) did not differ from non-dieters on a measure of body dissatisfaction. However, "unhealthy" dieters, who used extreme dieting strategies (including self-induced vomiting and laxatives), reported significantly more body dissatisfaction and binge eating (2010). Therefore, dieting motivated by body dissatisfaction may be more likely to employ restrictive patterns of eating (Putterman & Linden, 2004), even when the dieter is experiencing true physiological hunger. This practice is considered pathological in and of itself (Lowe & Levine, 2005), and may increase the risk for other pathological behaviors, such as binge eating. Thus, using intuitive eating as a standard for psychologically healthy eating can help differentiate between unhealthy dieting, which involves restricting even in the presence of true physiological hunger, and healthy dieting, which is guided by physiological hunger cues.

Conclusion

Intuitive eating appears to be a construct that approximates a psychological definition of healthy eating. However, some questions remain to be answered. First, intuitive eating may not be a comprehensive definition of healthy eating. There is preliminary evidence that the ability to enjoy food, as well as moderation and flexibility in eating, may be important constructs to include in a definition of psychologically healthy eating. This study tested this idea by adding items to the Intuitive Eating Scale-2 (IES-2) that captured the enjoyment of food, moderation, and flexibility, and then determining whether adding these items provided incremental validity to the IES-2. Second, the idea that there are two factors that are important for truly healthy eating: eating content (nutritionally healthy eating) and eating process (psychologically healthy eating) has never been tested empirically. This study tested this idea by measuring both nutritionally healthy eating and psychologically healthy eating. Third, although ethnic differences emerged in the literature for nutritionally healthy eating, they have never been investigated with relation to intuitive eating. Consequently, this study explored relationships between ethnic identity and psychologically healthy eating. Fourth, although research has found that women score higher on nutritionally healthy eating but lower on psychologically healthy eating than men, it is unknown whether these findings would replicate in an undergraduate sample. This study tested whether these gender differences on nutritionally and psychologically healthy eating replicated to the current sample. Fifth, according to the two-factor theory of healthy eating, psychologically healthy eating was expected to be negatively correlated with BMI, disordered eating, unhealthy dieting strategies, emotional eating, and hedonic hunger. Additionally,

nutritionally healthy eating was expected to correlate negatively with BMI. This study performed correlations between these variables to test these predictions. Finally, if the two-factor theory of healthy eating is valid, then it was expected that four groups would emerge from a latent profile analysis: (1) high nutritionally healthy eating + high psychologically healthy eating, (2) high nutritionally healthy eating + low psychologically healthy eating, (3), low nutritionally healthy eating + high psychologically healthy eating, and (4) low nutritionally healthy eating + low psychologically healthy eating (See Figure 2).

The Current Study

This study recruited an undergraduate sample to complete measures of psychologically healthy eating and nutritionally healthy eating. Participants were asked to complete four 24-hour dietary recalls and an online survey. The online survey included measures of other variables thought to relate to psychologically or nutritionally healthy eating, including BMI, hedonic hunger, emotional eating, disordered eating, healthy and unhealthy dieting strategies, body dissatisfaction, and overall psychological health. The data collected from the 24-hour recalls were converted into HEI scores, which was the main measure of nutritionally healthy eating. Additionally, items representing food enjoyment, eating in moderation, and flexibility with regard to eating were developed and added to the IES-2 in order to create the Psychologically Healthy Eating measure (PHE).

Aims and Hypotheses

Aim #1: Investigate the construct validity of the measure of psychologically healthy eating.

Hypothesis #1. It was expected that a confirmatory factor analysis (CFA) of the measure of psychologically healthy eating would provide support for its construct validity by resulting in seven factors, including the original four factors from the IES-2, as well three factors representing food enjoyment, eating moderation, and eating flexibility;

Hypothesis #2. It was hypothesized that adding items to the IES-2 that capture the ability to enjoy food, eat moderately, and show flexibility with regard to eating would provide incremental validity by increasing its relationship with a measure of psychological health (Mental Health Inventory; see the Method section for more details on this measure);

Hypothesis #3. The measure of psychologically healthy eating was expected to demonstrate convergent and discriminant validity. Specifically, it was hypothesized that psychologically healthy eating would correlate in the negative direction with BMI, hedonic hunger (Power of Food Scale), emotional eating (Dutch Eating Behavior Questionnaire – Emotional Eating subscale), disordered eating (Eating Disorder Examination-Questionnaire), unhealthy dieting strategies (Dieting and Weight Control Behavior Checklist), and body dissatisfaction (Body Shape Questionnaire). However, psychologically healthy eating was expected to correlate in the positive direction with psychological health (Mental Health Inventory).

Aim #2: Investigate the two-factor theory of healthy eating.

Hypothesis #4. Nutritionally healthy eating and psychologically healthy eating on the PHE were expected to be orthogonal;

Hypothesis #5. It was hypothesized that nutritionally healthy eating and psychologically healthy eating could be used to categorize participants. Specifically, four separate categories of individuals were expected to emerge from a latent profile analysis (see Figure 2). Exploratory analyses investigating differences among these four groups were planned.

Aim #3: Investigate group differences on psychologically and nutritionally healthy eating.

Hypothesis #6. The Hispanic participants were expected to report high levels of acculturation and score similar to Non-Hispanic participants on nutritionally healthy eating;

Hypothesis #7. Women were expected to score higher nutritionally healthy eating than men, but men were expected to score higher on psychologically healthy eating than women;

Hypothesis #8. An exploratory investigation of the relationships between self-reported ethnic identity (demographics form) and psychologically healthy eating was planned.

Chapter 2

Method

Participants

A total of 620 women and men from the University of New Mexico who were at least 18 years of age were recruited through announcements in upper-level psychology classes and through a web-based system that allows introductory psychology students to register for studies online. Introductory psychology class students received course credit for participating and upper-level students received extra credit. The study was reviewed and approved by the university's Institutional Review Board.

Of the 620 participants who completed the online consent form (Appendix A), nine canceled their study enrollment online for unknown reasons, and 88 students did not complete the four 24-hour dietary recalls and so were eliminated from the sample. An additional 27 participants completed the four recalls, but did not complete the online survey. This resulted in an overall retention rate of 80.0%. Four individuals were eliminated because they indicated in the online survey that they were not fluent in English, and two were eliminated because they indicated they were pregnant. Finally, 11 participants who were over 40 years of age were eliminated due to research finding age differences in eating and body image (Liechty, Ribeiro, Sveinson, & Dahlstrom, 2014; Striegel-Moore et al., 2003).

The final sample included 479 participants (see Table 1 for demographic details). Most (353; 73.7%) identified as female, 125 (26.1%) identified as male, and one participant (0.2%) identified as transgender. With regard to ethnicity, 219 (45.7%) reported they were not of Hispanic, Latino, or Spanish origin, 250 (52.2%) indicated they

were Hispanic, Latino, or Spanish origin, and 10 (2.1%) reported their origin as unknown. For race, 288 (60.1%) reported White, 98 (20.5%) indicated they were some other race, 27 (5.6%) selected American Indian/Alaskan Native, 23 (4.8%) indicated they belonged to more than one race, 17 (3.5%) indicated Black/African American, 15 (3.1%) reported Asian, and 11 (2.3%) selected Unavailable/Unknown.

Age ranged from 18 to 40, with an average of 20.83 (*SD*=3.87). Regarding marital status, 398 (83.1%) reported they were never married, 45 (9.4%) indicated they were cohabitating with a partner, 30 (6.3%) stated they were married, and 6 (1.3%) were divorced. When asked about sexual orientation, 448 (93.5%) identified as heterosexual, 21 (4.4%) selected bisexual, and 10 (2.1%) reported they were gay/lesbian. The majority of the sample (448; 93.5%) reported they did not have children.

BMI ranged from 14.93 to 47.03, with a mean of 23.90 (*SD*=5.04). Three hundred and ten participants (64.7%) were in the normal weight category (BMI between 18.5 and 24.99); 82 (17.1%) were overweight (BMI between 25 and 29.99); 56 (11.7%) were obese (BMI greater than 30); and 31 (6.5%) were underweight (BMI less than 18.5). When asked about food allergies, special diets, and medical conditions affecting eating patterns, 73 (15.2%) endorsed a food allergy, 34 (7.1%) reported a special diet, and 30 (6.3%) endorsed a medical condition affecting eating.

Procedure

Recruited participants were told that the study consisted of two parts. For the first part, they were asked to complete four separate 24-hour food recalls using the online Automated Self-Administered 24-hour recall (ASA-24). It took participants approximately 30 minutes to complete a 24-hour recall. Participants were not told in

advance *when* they would be asked to fill out the recalls; instead, they were prompted unexpectedly via emails which provided the website link (along with participants' unique usernames and passwords) to access the online 24-hour recall site. Prompts were sent out early in the morning, and once prompted, participants had up to midnight that day to complete the recall. Participants were asked to complete three weekday recalls and one weekend recall. Only participants who completed all four recalls (523 of 620 participants, or 84.4%) were allowed to participate in the second half of the study, which consisted of a two hour online survey administered using an online survey program. Participants who completed all four recalls were sent an email message with a code allowing them to access the online survey portion of the study. They had approximately one week to complete the online survey.

Converting the ASA-24 data into HEI scores required the use of a SAS macro, which was freely available via the National Cancer Institute's ASA24 website at http://appliedresearch.cancer.gov/asa24/resources/hei.html. To run the macro required the services of a statistics consultant. Initially, the macro produced scores for each participant on the HEI, averaged across the four recall days. However, the initial results produced by the macro were problematic in several ways, and so the author of the macro was consulted. The error was rectified, producing meaningful results.

Measures

Healthy eating measures.

Automated Self-Administered 24-hour recall (ASA-24; Subar et al., 2012). The ASA-24 was included in this study in order to measure nutritionally healthy eating. The ASA-24 is an online tool for collecting 24-hour recall dietary data from participants that

can be converted into HEI scores. It utilizes a standardized method, the automated multiple pass method (AMPM), which cues participants to remember what they ate in the past 24 hours. This method improves the accuracy of 24-hour recalls (Moshfegh et al., 2008). The ASA-24 uses an animated guide to instruct participants how to complete the recall. This guide collects information on eating occasions, time of eating, food and beverages consumed, food preparation details, and portion size (Subar et al., 2012). Participants select their food and drink either through using a search function or through navigating categorized lists of foods. Food photographs aid participants in estimating their portion sizes, a feature which also has been shown to improve the accuracy of 24-hour recall data (Subar et al., 2010). The ASA-24 automatically queries participants regarding whether they ate anything during any reporting gap of three hours or more. Additionally, it queries participants on frequently forgotten food and beverages, and allows participants multiple opportunities to alter their responses (Subar et al., 2012). The ASA-24 automatically calculates MyPyramid Food Equivalents, which can be converted into Healthy Eating Index scores.

Healthy Eating Index (HEI; Kennedy et al., 1995). The HEI was included in the present study as a global index of nutritionally healthy eating. The HEI assesses the extent to which the goals recommended in the dietary guidelines developed by the U.S. Department of Agriculture are met (Kennedy et al., 1995). This index is essentially a method of coding nutrition information that was collected through some other mechanism, in this case through 24-hour dietary recalls. The most recent version, HEI-2010, is based on the 2010 dietary guidelines (Guenther et al., 2013).

The HEI consists of 12 subscales, which are divided into two categories. The first category, referred to as an "adequacy" category, contains nine scales that are scored according to whether minimum recommendations set forth by the U.S. Department of Agriculture are met. These nine scales include: 1) total fruit, 2) whole fruit (which does not include fruit juice), 3) total vegetables, 4) greens and beans, 5) whole grains, 6) dairy, 7) protein, 8) seafood and plant proteins, and 9) fatty acids. The HEI's "moderation" category includes three scales that are scored according to whether the maximum amount recommended is exceeded. These three scales include 1) refined grains, 2) sodium, and 3) empty calories. All of the categories are scored proportionally; that is, they are scored relative to total calorie intake. The adequacy scales are scored five points each, with the exception of whole grains, dairy, and fatty acids, which are scored 10 points each. The moderation scales are scored 10 points each, except for fatty acids, which is scored 20 points. The resulting score is out of a possible 100 points, with scores over 80 considered "good", scores between 50 and 80 viewed as "needs improvement", and scores below 50 being "poor".

The HEI appears to be generally valid for measuring the extent to which a population's diet conforms to the standards of the U.S. Dietary Guidelines. As expected, the HEI gave near perfect scores to menus developed by dietary experts (Guenther, Reedy, Krebs-Smith, & Reeve, 2008), and gave a menu at a popular fast food chain a score in the "poor" range (Guenther et al., 2008). The HEI is also negatively related to abdominal obesity in adults (Tande et al., 2010) and to physical disability in older adults (Xu et al., 2011; Xu, Houston, Locher, & Zizza, 2012). Taken together, these findings provide support for the validity of the HEI.

Intuitive Eating Scale (IES-2; see Appendix B; Tylka & Kroon Van Diest, 2013). The original 21-item IES (Tylka, 2006) was recently modified to create the IES-2. This newer instrument retains 11 of the original 21 items, but includes an additional 12 items, for a total of 23 items. The items are on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores on the IES-2 reflect higher levels of intuitive eating. The IES-2 contains four scales that correspond to the different tenets of intuitive eating. The first, unconditional permission to eat (UPE), reflects a tendency to eat until satiated. The second factor, eating for physical rather than emotional reasons (EPR), measures the ability to eat when physically hungry rather than using food as a way of coping with negative emotions. Reliance on hunger and satiety cues (RHS), the third factor, entails the ability to use physiological hunger and satiety cues to regulate eating. Finally, a fourth factor, which was only added to the second version of the IES, is called body-food choice congruence (BFCC). This factor represents the ability to allow the needs of one's body to guide food choices (Tylka & Kroon Van Diest, 2013).

The IES-2 had good internal reliability in a college sample, with an overall alpha of .87 for women and .89 for men. Alphas for the four scales ranged from .81 to .93 (Tylka & Kroon Van Diest, 2013). Additionally, the authors found evidence for strong measurement invariance of the IES-2 across men and women, indicating that it is appropriate to compare mean scores across the genders (Tylka & Kroon Van Diest, 2013). Exploratory analyses provided support for the four-factor structure of the IES-2, and the IES-2 demonstrated good convergent and discriminant validity, providing support for the measure's construct validity (Tylka & Kroon Van Diest, 2013). In the current study, internal consistency reliability was good, α=.85.

Additional items and the creation of the Psychologically Healthy Eating measure. In addition to the IES-2, items relating to the ability to enjoy food, moderation with regard to food, and flexibility around eating were administered to participants. These items were developed based on the existing literature and measures (Donini, Marsili, Graziani, Imbriale, & Cannella, 2005; Freeland-Graves et al., 2013; Vailas & Nitzke, 1998). First, items were generated by a team of researchers familiar with the literature. These items were designed to match the formatting of the IES-2; thus, items were on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Subsequent to item generation, the items were presented to a group of approximately six expert raters consisting of psychologists and graduate students with special knowledge of the subject. The expert raters were asked for suggestions regarding other factors and/or items to add to the measure. Next, the expert raters as well as a group of undergraduate students were asked for feedback regarding the content and readability of the items. This resulted in a final pool of 24items (See bolded items at the end of Appendix A). For the Enjoyment scale, a sample item reads, "I am someone who enjoys food." An example item reflecting the construct of Moderation is, "If a restaurant serves large portion sizes, I split meals with others or take home leftovers so that I don't overeat." Finally, "If I forgot to bring my lunch or a snack to work/school, I would buy something to eat if I got hungry, even if it wasn't as healthy as my normal food" is one of the items designed to reflect Flexibility. Once these items were added to the IES-2, the measure was referred to as the Psychologically Healthy Eating (PHE) measure. Within the 24 items added to the IES, the internal consistency reliability was low, α=.56. On the overall 47-item PHE, internal consistency reliability was better, α=.84.

Disordered eating and body dissatisfaction measures.

Body Shape Questionnaire (BSQ; see Appendix C; Cooper, Taylor, Cooper, & Fairburn, 1987). The 34-item BSQ was included in the current study to assess body dissatisfaction. Participants are asked to respond to the items according to how often they applied to them during the previous four weeks using a five point Likert Scale ranging from 1 (*never*) to 6 (*always*). Higher scores indicate higher levels of body dissatisfaction (Evans & Dolan, 1993). An example item is, "Have you felt ashamed of your body?" The instrument shows good test-retest reliability and criterion validity in women with body image distress, obese dieters, and undergraduate women (Rosen, Jones, Ramirez, & Waxman, 1996), and has a Cronbach's alpha of .98 in European-American women (Warren et al., 2008). However, since the instrument has been shown to have weak measurement invariance across a sample of Hispanic Americans and White Americans taking the English version of the instrument (Warren et al., 2008), mean differences on the BSQ across the two ethnicities in the current study were not investigated. In this study, internal consistency reliability was excellent, α=.98.

Dutch Eating Behavior Questionnaire-Emotional Eating Subscale (DEBQ; see Appendix D; Van Strien, Frijters, Bergers, & Defares, 1986). The DEBQ is a 33-item questionnaire assessing restraint, external eating (eating in response to the presence of food), and emotional eating. The 13-item emotional eating (EE) subscale, which was used for the purposes of this study, can be further divided into two subscales: a nine-item subscale reflecting the tendency to eat in response to specific emotions, and a four-item subscale reflecting the tendency to eat in response to diffuse (unidentified) emotions. These items are on a five-point Likert scale ranging from 1 (*Never*) to 5 (*Very Often*).

The emotional eating subscale correlates with a measure of bulimia, and predicts food intake in the laboratory (van Strien, 2000). It also varies in expected ways across women with different eating disorder diagnoses, with women with BN scoring the highest on emotional eating (Wardle, 1987). In this study, internal consistency reliability was excellent, α=.95.

Eating Disorder Examination-Questionnaire (EDE-Q; see Appendix E; Fairburn, 2008). The EDE-Q is used to assess overall eating pathology. This 28-item questionnaire was developed from a structured clinical interview designed to diagnose eating disorders, the Eating Disorders Examination (EDE; Fairburn & Cooper, 1993). The first 21 questions ask participants to report on how many of the last 28 days they have engaged in different thoughts and behaviors related to eating disorders. For the first 12 questions, the options range from 0 (*no days*) to 6 (*every day*). Items # 13-18 ask participants to write in the number of times they have performed various eating behaviors over the past 28 days. Item # 19 asks how many times one has eaten in secret, and offers the same response options as the first 12 questions. Item # 20 asks the proportion of times one has felt guilty after eating, and gives responses ranging from 0 (*none of the time*) to 6 (*every time*). The next eight questions ask participants to rate from 0 (*not at all*) to 6 (*markedly*) the degree to which certain eating disorder symptoms affected them over the past 28 days.

The EDE-Q provides a global index of disordered eating, and also has four subscales known as Eating Concern, Weight Concern, Shape Concern, and Restraint. For the purposes of this study, the global index was used to assess disordered eating. Both the EDE-Q and the structured clinical interview are widely used (Allen, Byrne, Lampard,

Watson, & Fursland, 2011) and have good test-retest and internal reliability in student samples (Luce & Crowther, 1999). Furthermore, the measure's convergent, concurrent, and discriminant validity have been demonstrated across a variety of samples (Carter, Aimé, & Mills, 2001; Luce & Crowther, 1999; Mond, Hay, Rodgers, Owen, & Beumont, 2004; Mond et al., 2008). In this study, the overall α for the EDEQ was .95.

Power of Food Scale (PFS; see Appendix F; Lowe et al., 2009). The PFS is a 15-item measure designed to assess hedonic hunger. The items are on a 5-point Likert scale ranging from 1 (*I don't agree*) to 5 (*I strongly agree*). Acceptable internal consistency was demonstrated in college students, a clinical sample of obese individuals, and in a nationally representative sample (Cappelleri et al., 2009; Lowe et al., 2009). Factor analyses indicated that the PFS contains three subscales, including 1) food present, 2) food available, and 3) food tasted (Cappelleri et al., 2009). This factor structure was independently confirmed in a separate sample (Lowe et al., 2009). The PFS demonstrates negligible to small correlations with BMI (Cappelleri et al., 2009), accounts for variance in eating behavior above and beyond measures of restraint (Lowe et al., 2009), and predicts food cravings and consumption (Forman et al., 2007). Additionally, one weight loss study with obese subjects found that decreases in hedonic hunger were associated with weight loss (O'Neil et al., 2012). These findings support the reliability and validity of the PFS. In this sample, the overall α was good, α=.94.

Dieting measures.

Dieting and Weight Control Behavior Checklist (DWCBC; Neumark-Sztainer et al., 2006; see Appendix G). The DWCBC consists first of a single question asking whether participants have engaged in any kind of dieting behavior in order to lose weight

in the past year. Participants are given four potential responses to this item, ranging from 0 (*Never*) to 4 (*I am always dieting*). Following this item, participants are asked if they have used any of the strategies listed on the checklist in order to lose weight or prevent weight gain in the past year. Participants are asked to respond "Yes" or "No" to each of the four healthy and nine unhealthy dieting strategies. Thus, possible scores on the healthy dieting scale range from 0 to 4 and possible scores on the unhealthy dieting scale range from 0 to 9. Previous research has supported an association between the unhealthy dieting items and both binge eating (Neumark-Sztainer et al., 2006) and poorer nutrition (Neumark-Sztainer, Hannan, Story, & Perry, 2004) in adolescent females.

Background and cultural measures.

Scale of Ethnic Experience **(**SEE; Malcarne, Chavira, Fernandez, & Liu, 2006; see Appendix H). The SEE is a measure of ethnic identity and acculturation appropriate for use with members of any ethnicity. It consists of 32 items on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The items group into four factors: Ethnic Identity, Perceived Discrimination, Mainstream Comfort, and Social Affiliation. An example item states, "Being a member of my ethnic group is an important part of who I am." The Ethnic Identity subscale can be used as a measure of acculturation; higher scores indicate less acculturation. The measure demonstrates adequate consistency and validity (Malcarne et al., 2006). In this study, overall internal consistency reliability was good, α=.85.

Demographics (Appendix I). A standard demographics form was used to collect data on gender, ethnicity, education status, marital status, and height and weight (to allow for the calculation of BMI).

Measure of psychological health.

Mental Health Inventory (MHI; Veit & Ware, 1983; see Appendix J). The MHI is a 38-item measure of psychological well-being that was included in this study because it provides an overall mental health score. The items are on a six point scale that varies according to the question. An example item is "How much of the time, during the past month, have you felt calm and peaceful?" Possible responses on this item range from 1 (*All of the time*) to 6 (*None of the time*). The MHI has two higher-order factors, psychological distress and psychological well-being, as well as five lower-order factors. In addition to producing these subscale scores, the MHI provides a global index of mental health. The factor structure was cross-validated in several different samples, and the measure demonstrated satisfactory internal reliability across these samples (Veit & Ware, 1983). In this study, internal consistency reliability of the MHI was excellent, α=.95.

Chapter 3

Results

Data Analysis Plan

For a summary of results, see Table 2. Data were analyzed using Mplus version 7.3 and SPSS version 22.0. Due to an error in the online survey settings that did not permit respondents to skip items, there were no missing data. Data were examined for normality, outliers, multivariate outliers, and collinearity, and these assumptions were met except where specifically stated. Multivariate outliers were identified using Mahalanobis Distance according to the procedures described by Tabachnik and Fidell (2012).

Confirmatory factor analyses (CFA) were performed. CFA models are theoretically-driven models that assume the presence of an overall latent factor that can account for variability within scale items (see Bollen, 1989). These items relate to the latent factor via factor loadings. Variability in the items not accounted for by the latent factor is referred to as residual variance. In this study, CFAs were performed on the variance-covariance matrix, and scale was provided by constraining one item loading to 1.0 for each factor in the model. Additionally, latent factor variances were set to 1.0 and means to 0. As indicators were ordinal, a robust weighted least squares estimator was utilized. Model fit was assessed using χ^2, CFI, TLI, RMSEA, and SRMR according to the guidelines put forward by Hu and Bentler (1999). Specifically, the following cutoffs were interpreted to mean good model fit: CFI and TLI $\geq .95$, TLI $\geq .95$, RMSEA $\leq .06$, and SRMR $\leq .08$.

Where CFAs failed to provide good model fit, Exploratory Factor Analyses (EFAs) were implemented in a randomly selected half of the data. EFAs are a data-driven approach to deriving a factor structure for a given scale; they produce several models, beginning with a one-factor model and increasing the number of factors until the specified limit is reached. The number of factors to retain was determined using parallel analyses (see Horn, 1965), which compare the actual eigenvalues present in the data with the 95th percentile of the distribution of eigenvalues derived from random data. Parallel analyses were performed using O'Connor's Monte Carlo macro for SPSS using principal axis rotation. Random data were created through a Monte Carlo simulation that included 1000 random permutations based on the raw data (O'Connor, 2000). EFAs were conducted using geomin rotation. Items loading greater than .4 on a factor were retained in the model, and items with cross-loadings were eliminated from the model. Once an appropriate model was found, a CFA of the model was conducted on the same half of the sample to confirm good model fit. To ensure replicability, the CFA was then conducted in the other half of the data. Finally, a CFA was conducted in the entire sample to produce the final model.

Multiple-groups CFA was then used to test measurement invariance (Widaman & Reise, 1997). Measurement invariance is an important step for determining whether a scale measures the same latent construct across two groups. To test for measurement invariance, a series of progressively more restrictive models are fitted. The first model is known as the configural invariance model, which specifies that the same items load onto the same factors in both groups. This model is assessed using traditional indices of model fit; good model fit indicates that the same latent factors are being measured in both

groups. The next model is the weak invariance model, which constrains factor loadings to equality across groups. As the weak invariance model is nested within the configural model, fit can be assessed according to the chi square difference test (χ^2_{diff}). A significant test indicates that the more restrictive model is significantly worse than the configural invariance model. In the case of the weak invariance model, a non-significant chi square difference test indicates that the measure has the same unit of measurement across the two groups. The third model is the strong invariance model, which constrains item thresholds to equality across groups. Again, model fit is assessed using the chi square difference test. If this model is not significantly worse than the weak invariance model, then measurement invariance is achieved, indicating that the measure has the same origin across groups. If strong invariance is achieved, it is psychometrically valid to compare mean scores on the measure across the two groups (Chen, Sousa, & West, 2005).

Latent profile analyses (LPAs) also were conducted. LPAs are a type of mixture model. Mixture models are probabilistic models that assume the presence of latent classes of individuals within the data. LPAs have categorical latent variables, which represent class membership, and continuous indicator variables (Gibson, 1959). Class membership is based upon the continuous indicators entered into the model; the analysis maximizes homogeneity within classes and heterogeneity between classes. Typically LPAs are conducted in an exploratory fashion by specifying an increasing number of latent classes in the model and assessing each model using fit indices. Commonly used indices include the Bayesian Information Criterion (BIC; Schwarz, 1978)), sample-size adjusted BIC (aBIC; Sclove, 1987), Lo-Mendell Rubin likelihood ratio test (LMR; Lo, Mendell, & Rubin, 2001), and bootstrap likelihood ratio test (BLRT; McCutcheon, 1987;

McLachlan & Peel, 2004). The aBIC and BIC are global fit indices, with lower values indicating better fit. The LMR and BLRT compare the mixture model to a mixture model with one fewer classes. A significant result indicates that the current model is significantly better than the model with fewer classes. Finally, entropy is an index of classification precision, with higher values indicating better separation across the classes (Tein, Coxe, & Cham, 2013).

Descriptive Statistics

Overall, scores on the IES-2 and HEI and their subscales were similar to means reported in previous research conducted in college samples (Guenther et al., 2014; Tylka & Kroon Van Diest, 2013). According to the classification scale for the HEI suggested by the authors, most of the sample (279; 58.2%) had poor diet quality (HEI score ≤51), a substantial proportion (189 or 39.5%) had diets that need improvement (HEI between 51 and 80), and very few (11 or 2.3%) had good quality diets (HEI scores ≥80). See Table 3 for means on all study measures for the overall group and by gender.

Aim #1: Investigate the Construct Validity of Psychologically Healthy Eating

Hypothesis #1: A confirmatory factor analysis (CFA) of the measure of psychologically healthy eating would provide support for its construct validity. As one of the main purposes of the study was to examine the construct of psychologically healthy eating, the hypothesized 7-factor structure of the PHE was investigated via a CFA. Items were ordinal, and 27 participants were identified as multivariate outliers on the PHE and excluded from this analysis, for a final sample of 452. Results indicated that the model provided a poor fit to the data, $\chi^2(1014)=4661.26$, $p<.001$; RMSEA=.089 (95% CI: .087-.092); CFI=.80, TLI=.79. Therefore, EFA was utilized to investigate the factor

structure of the PHE. The initial EFA was conducted in a randomly chosen subset (50%) of the data in conjunction with a parallel analysis to statistically determine the number of significant factors present in the data (six). However, the resulting model provided a poor fit to the data according to a CFA performed on the same subset of data, $\chi^2(215)=554.40$, $p<.001$; RMSEA=.084 (95% CI: .08-.09); CFI=.93, TLI=.92.

As these analyses did not result in an acceptable model for the PHE, it was decided to undertake a CFA of the four factor, 23-item factor structure of the IES-2 according Tylka et al. (2013). Nineteen (4.0%) multivariate outliers on the IES-2 were identified and eliminated from analyses, for a resulting sample size of 460. Again, the analysis resulted in poor model fit, $\chi^2(224)=1289.26$, $p<.001$, RMSEA=.102 (95% CI: .096 - .107), CFI=.925, TLI=.915, SRMR=.084. Given this finding, an EFA of the IES-2 was performed. Again, analyses were initially conducted in a randomly selected subset (50%) of the data. Parallel analyses within this subset indicated the presence of 6 statistically significant eigenvalues. Four items were eliminated from the model due to cross-loadings and one item was eliminated because it did not load onto any items. This resulted in a six-factor, 18-item version of the IES. This model provided a poor fit to the data in the first subset of data, $\chi^2(129)=444.515$, $p<.001$, RMSEA=.102 (95% CI: .092-.113); CFI=.933, TLI=.921, SRMR=.085.

However, examination of the modification indices identified two additional items causing model misfit due to a tendency to load onto multiple factors. When these items were eliminated from the model and the EFA and parallel analysis were re-run, the result was a 4-factor, 16-item model. According to a CFA in the first half of the sample, this model provided an adequate fit to the data, $\chi^2(98)=239.669$, $p<.001$; RMSEA=.079 (95%

CI: .066-.091); CFI=.969, TLI=.962, SRMR=.062. The model also replicated in the second half (n=226) of the sample, $\chi^2(98)=320.782$, $p<.001$; RMSEA=.100 (95% CI: .088-.112); CFI=.963, TLI=.955, SRMR=.078. It is notable that the chi square goodness of fit test was significant despite the relatively small sample size. Investigation of the residual correlations revealed that several correlations exceeded 0.1, which might explain the significant chi square. Finally, the model provided an adequate fit in the full (N=452) data set, $\chi^2(98)=411.017$, $p<.001$; RMSEA=.083 (95% CI: .075-.092); CFI=.970, TLI=.963, SRMR=.059. See Figure 3 for the factor structure and parameter estimates. The four factors in this final model strongly resembled the initial factor structure of the IES-2, with the main difference being that the four subscales were somewhat shortened in comparison with the initial factor structure. Thus, a 3-item Unconditional Permission to Eat scale, a 6-item Eating for Physical Rather than Emotional Reasons scale, a 3-item Reliance on Hunger and Satiety Cues scale, and a 3-item Body-Food Choice Congruence subscale emerged. Note that the 16-item version of the IES found in this analysis is subsequently referred to as the IES-16 to distinguish it from the 23-item IES-2. To summarize, the factor structure of the PHE was not supported, and a 16-item version of the IES-2 was developed.

Hypothesis #2: Adding items on food enjoyment, moderation, and flexibility to the Intuitive Eating Scale-2 (IES-2) would provide incremental validity. As it was not possible to find an adequate model of the PHE, the incremental validity of the PHE over the IES-2 was not assessed. Thus, subsequent analyses focus on the IES-16 rather than the PHE as the main measure of psychologically healthy eating.

Hypothesis #3: The measure of psychologically healthy eating would demonstrate convergent and discriminant validity. Specifically, it was hypothesized that the measure of psychologically healthy eating (the IES-16) would be negatively correlated with BMI, hedonic hunger, emotional eating, disordered eating, unhealthy dieting strategies, and body dissatisfaction, but positively correlated with psychological health. Pearson's correlations were performed between the IES-16 and the following variables: PFS, DEBQ-EE, EDE-Q global scores, the number of unhealthy dieting strategies endorsed on the DWCBC, and MHI. The hypotheses were all supported. Specifically, the IES-16 was negatively correlated with BMI, $r(479)=-.288$, $p<.001$, POFS, $r(479)=-.341$, $p<.001$, DEBQ-EE, $r(479)=-.571$, $p<.001$, EDEQ Global scores, $r(479)=-.482$, $p<.001$, DWCBC unhealthy dieting strategies, $r(479)=-.329$, $p<.001$, and BSQ, $r(479)=-.473$, $p<.001$. Also in accordance with this hypothesis, the IES-16 was positively correlated with the MHI, $r(479)=.336$, $p<.001$. These findings support the construct validity of the measure of psychologically healthy eating utilized in this study, the IES-16.

Aim #2: Investigate the Two-Factor Theory of Healthy Eating

Hypothesis #4: Nutritionally and psychologically healthy eating would be orthogonal. One of the main purposes of this study was to explore a two-factor healthy eating classification system. It was hypothesized that the two factors in this classification system, psychologically healthy eating and nutritionally healthy eating, would not correlate significantly. To test this hypothesis, a Pearson's correlation was performed between the IES-2 and the total score on the HEI. As predicted, the correlation was nonsignificant, $r(479)=.021$, $p>.05$, indicating that psychologically healthy eating and

nutritionally healthy eating were not related. The fact that these two constructs were not related supports the idea of using them as independent factors in a two-factor model of healthy eating.

Hypothesis #5: Nutritionally and psychologically healthy eating could be used in a two-factor categorization of healthy eating. Another main purpose of the study was to investigate whether it is possible to meaningfully categorize individuals based on levels of psychologically and nutritionally healthy eating. To test this idea, a latent profile analysis was conducted.

Latent profile analysis. The latent profile analysis (LPA) included the following indicators: measures of psychologically healthy eating (the latent factor scores on the four subscales of the IES-16) and measures of nutritionally healthy eating (the adequacy and moderation scales of the HEI). All models were run using 1000 random starts and 500 final stage optimizations. In each model, the loglikelihood value was inspected to ensure that replication was achieved and local maxima were not reached. Models were estimated using maximum likelihood estimation. Although four classes were expected, an exploratory framework was utilized due to the lack of prior research in this area; therefore, models with 2, 3, 4, 5, and 6 classes were estimated. The model with the best fit and most interpretable classes was retained using aBIC, BIC, LRT, and BLRT. Although the plan was to first investigate the models in one half of the sample and replicate in the second half, due to the number of parameters in the model and the small sample size created by halving the sample, the models were run in the full sample from the start.

To investigate the class structure of the data, the 2-class model was run first. For fit statistics, see Table 4. Visual inspection of the indicator means showed that the two classes were similar on the four factors of the IES, but were consistent with a nutritionally healthy (high scores on both HEI scales) and nutritionally unhealthy (low scores on both HEI scales) group. Both the Lo-Mendel Rubin (LMR) test and bootstrap likelihood ratio test (BLRT) were significant, indicating that a two-class model fit the data better than a one-class model.

The three-class model was also run. Again, fit indices improved for the 3-class model versus the 2-class model. According to visual inspections of class means, the first class was average with regard to the IES-2 and HEI scales. The second class was average on the four IES-2 scales but high on the HEI scales, and the third class was high on both the IES-2 and the HEI scales.

For the four-class model, fit indices again indicated a superior fit compared to the three-class model. The characteristics of the classes indicated the presence of a class scoring low on the IES-2 scales and low on the HEI scales, a class scoring high on IES-2 scales and high on HEI scales, a class scoring intermediate on IES-2 scales and high on HEI scales, and a class scoring intermediate on the IES-2 scales and low on HEI scales.

The 5-class model again showed superiority to the 4-class model according to fit indices. Again, class means on indicators were inspected to interpret the results. The classes were consistent with 1) a **Healthy** (high IES-2 and high HEI) group, 2) a **Dieting** (medium IES-2 and high HEI) group, 3) a **Non-dieting** (medium IES-2 and medium HEI) group, 4) an **Intuitive** (high IES-2 and low HEI) group, and 5) an **Unhealthy** (low IES-2 and low HEI) group. See Table 5 for the group means.

Finally, a 6-class model was tested. According to the LRT, this model was not significantly better compared to the 5-class model. Additionally, the aBIC and BIC demonstrated only slight improvements, and the means of the 6-class model were difficult to interpret. Therefore, the 5-class model was adopted as the final model.

Investigation of group differences among the five classes. To investigate the differences among the five classes identified in the LPA, participants were categorized according to their most likely latent class. It is important to note that LPAs are probabilistic, and classification of individuals occurs based on most likely class membership. Therefore, individuals are not classified perfectly, and there is error within class membership. The variable representing most likely class membership was used as a grouping variable to make group comparisons utilizing one-way ANOVAs on the following variables: Body Mass Index (BMI), Mental Health Inventory (MHI), Body Shape Questionnaire (BSQ), Dutch Eating Behavior Questionnaire - Emotional Eating (DEBQ-EE), Power of Food Scale (PFS), Dieting and Weight Control Behavior Checklist (DWCBC) healthy and unhealthy dieting, Eating Disorder Examination - Questionnaire (EDEQ) Global scores, and Healthy Eating Index (HEI) Total scores. Results indicated that all of these variables differed significantly across classes, even after a Bonferroni correction was applied (.05/9 = .0055; see Table 6 for statistical details). As Levene's test indicated significant heterogeneity of variance for all one-way ANOVAs, follow-up tests were conducted using independent sample t tests that do not assume homogeneity of variance. For a summary of group differences, see Figure 1.

Healthy Eating Index (HEI). On HEI total score, individuals who were most likely classified in the Dieting group (M=65.87, SD=8.82) scored significantly higher

(i.e., 'healthier') compared to the other four groups. Individuals who most likely belonged in the Healthy group were next highest (*M*=59.42, *SD*=10.28), scoring significantly lower than the Dieting group, but significantly higher than the remaining three groups. Note that both of these groups scored in the "Needs Improvement" category on the HEI. Finally, participants who were most likely classified in the Unhealthy group (*M*=45.93, *SD*=9.00) scored third highest. This group was significantly lower than the Dieting and Healthy groups, but significantly higher than the Non-dieting and Intuitive Eating groups on the HEI. The Non-dieting (*M*=42.27, *SD*=7.96) and Intuitive Eating (*M*=39.55, *SD*=8.01) groups were not significantly different from each other, and scored the lowest on the HEI. These groups were all categorized as having "Poor" dietary quality according to the HEI. In summary, the Dieting group reported the highest level of nutritionally healthy eating, the Healthy group was second highest, the Unhealthy group was third highest, and the Non-dieting and Intuitive Eating groups were lowest on nutritionally healthy eating. These findings were consistent with predictions, with one exception: the finding that the Dieting group scored higher than the Healthy group was surprising, as the Healthy group was expected to score the highest on nutritionally healthy eating.

Intuitive Eating Scale - 16 (IES-16). On the IES-16, the individuals classified within the Healthy (*M*=68.1, *SD*=4.5) and Intuitive Eating (*M*=68.9, *SD*=3.8) groups were not different from each other, but were significantly higher on the IES-16 than all the other groups. Those individuals who most likely belonged to the Non-dieting group (*M*=56.0, *SD*=5.1) scored significantly higher on the IES-16 compared to the Dieting group (*M*=53.7, *SD*=6.0). Finally, the members who were categorized as most probably

belonging to the Unhealthy group (*M*=42.7, *SD*=5.2) scored significantly lower than the other four groups. In sum, as expected, the Healthy and Intuitive Eating groups scored highest on intuitive eating, the Non-dieting group was second highest, the Dieting group was third highest, and the Unhealthy group was lowest.

Body Mass Index (BMI). As expected, the individuals who most likely belonged to the Unhealthy group had the highest BMI (*M*=28.6, *SD*=7.4), which was in the overweight category, and was significantly higher than the other four groups. The individuals categorized within the Non-dieting (*M*=23.6, *SD*=4.9), Dieting (*M*=23.3, *SD*=3.6), and Healthy (*M*=23.1, *SD*=4.2) groups were intermediate on BMI and not significantly different from each other. Note that these BMIs were all in the normal weight category. Finally, contrary to hypotheses, those participants most likely belonging within the Intuitive Eating group (*M*=21.4, *SD*=2.6) had the lowest BMI, which was significantly lower compared to all the other groups, yet still in the normal weight category. Thus, the Unhealthy group had the highest (and an overweight) BMI, the Non-dieting, Dieting, and Healthy groups were intermediate (and normal weight) on BMI, and the Intuitive Eating group had the lowest (normal weight) BMI.

Mental Health Inventory (MHI). On the MHI, consistent with expectations, the individuals whose most likely class was the Unhealthy group (*M*=136.9, *SD*=26.2) scored significantly lower compared to the other four groups. As anticipated, the participants who most probably belonged to the Healthy group (*M*=69.6, *SD*=31.6) scored significantly higher on the MHI compared to the individuals whose most likely class was the Dieting (*M*=99.1, *SD*=37.9) and Non-dieting (*M*=83.5, *SD*=35.3) groups. The individuals in the Healthy group were not different from the individuals who were most

likely classified in the Intuitive Eating group (*M*=58.2, *SD*=24.4). In summary, with regard to psychological health, the Unhealthy group reported the lowest level, the Dieting and Non-dieting groups were intermediate, and the Healthy and Intuitive Eating groups scored the highest.

Body Shape Questionnaire (BSQ). Regarding body dissatisfaction, as expected, the group scoring the highest was the group of individuals whose most likely class was the Unhealthy class (*M*=121.8, *SD*=45.0), which scored significantly higher than all the other groups. Also consistent with predictions, the individuals who most probably belonged in the Dieting group (*M*=99.1, *SD*=37.9) were second highest on the BSQ, scoring significantly higher than the individuals categorized within the Healthy (*M*=69.6, *SD*=31.6), Non-dieting (*M*=83.5, *SD*=35.3), and Intuitive Eating (*M*=58.2, *SD*=24.4) groups. Finally, the individuals whose most likely classified within the Non-dieting group were third highest on the BSQ, scoring higher than the Healthy and Intuitive Eating groups. The Healthy and Intuitive Eating groups, in line with predictions, had the lowest levels of body dissatisfaction on the BSQ and were not significantly different from each other. Taken together, the Unhealthy group reported the highest level of body dissatisfaction, the Dieting group was second highest, the Non-dieting group was third highest, and the Healthy and Intuitive Eating groups were lowest.

Dutch Eating Behavior Questionnaire - Emotional Eating (DEBQ-EE). On the DEBQ-EE scale, the individuals classified within Unhealthy group (*M*=37.4, *SD*=12.7) scored the highest, and significantly higher than all the other groups. Next were the individuals whose most likely classes were the Dieting (*M*=27.7, *SD*=11.6) and Non-dieting (*M*=26.7, *SD*=10.1) groups, which were not different from each other, but were

significantly higher than individuals who most likely belonged to the Healthy (*M*=20.6, *SD*=10.0) and Intuitive Eating (*M*=15.0, *SD*=3.31) groups. The Healthy group was significantly higher compared to the Intuitive Eating group, which was the lowest on emotional eating. In summary, as would be expected, the Unhealthy group reported the highest level of emotional eating, the Dieting and Non-dieting groups reported the next highest level of emotional eating, and the Healthy and Intuitive Eating groups reported the lowest level of emotional eating.

Power of Food Scale (PFS). On the PFS, the individuals most likely classified within the Unhealthy group (*M*=40.4, *SD*=14.9) again scored significantly higher than the other four groups. The only other significant difference was between the participants categorized within the Healthy group (*M*=29.1, *SD*=12.9) and the Non-dieting group (*M*=33.9, *SD*=11.7); the Non-dieting group scored significantly higher on hedonic hunger compared to the Healthy group. This indicates that, as predicted, the Unhealthy group reported the most hedonic hunger compared to the other groups.

Dieting and Weight Control Behavior Checklist (DWCBC) - Healthy Dieting Scale. Regarding *healthy* dieting strategies on the DWCB, as anticipated, the individuals who most probably belonged in the Dieting group (*M*=3.5, *SD*=1.1) scored significantly higher than the individuals most likely belonging to the Healthy (*M*=2.9, *SD*=1.5), Non-dieting (*M*=2.6, *SD*=1.5), and Intuitive Eating (*M*=1.6, *SD*=1.4) groups but were not different from the participants classified in the Unhealthy (*M*=3.0, *SD*=1.4) group. The Healthy group scored significantly higher than the Intuitive Eating group, but was not different from the Non-dieting and Unhealthy groups. Finally, consistent with predictions, the Intuitive Eating group scored lowest of all the groups. This suggests that

the Dieting and Unhealthy groups reported the highest number of healthy dieting strategies, the Healthy and Non-dieting groups reported an intermediate number of healthy dieting strategies, and the Intuitive Eating group reported the fewest healthy dieting strategies.

Dieting and Weight Control Behavior Checklist (DWCBC) - Unhealthy Dieting Scale. For *un*healthy dieting strategies on the DWCB, again as anticipated, the individuals who most likely belonged to the Unhealthy (*M*=2.0, *SD*=1.9) and Dieting (*M*=1.5, *SD*=1.8) groups were significantly higher than the individuals classified in all of the other groups. The only other significant difference was that the Intuitive Eating group (*M*=0.4, *SD*=0.9) was significantly lower on unhealthy dieting strategies compared to the participants most likely classified in the Non-dieting group (*M*=1.0, *SD*=1.4). This finding was also consistent with predictions. Thus, the main findings were that the Unhealthy and Dieting groups reported the most unhealthy dieting strategies and the Intuitive Eating group reported the fewest unhealthy dieting strategies.

Eating Disorder Examination Questionnaire (EDEQ) - Global Scores. Regarding EDEQ Global Scores, as hypothesized, yet again the individuals who most probably belonged within the Unhealthy group (*M*=3.7, *SD*=1.4) scored higher than the remaining four groups. The participants classified within the Dieting group (*M*=3.1, *SD*=1.3) were second highest, scoring significantly lower than the Unhealthy group, but significantly higher compared to the individuals whose most likely class was one of the remaining groups (Healthy, Non-dieting, and Intuitive Eating). Consistent with expectations, the Intuitive Eating group (*M*=1.4, *SD*=0.5) scored lower on the EDEQ than the other four groups. The Non-dieting (*M*=2.3, *SD*=1.2) and Healthy (*M*=2.1, *SD*=1.0) groups were

not significantly different from each other. These findings indicate that the Unhealthy group reported the highest level of eating pathology; the Dieting group was second highest, and the Non-dieting and Healthy groups were third highest. Notably, the Intuitive Eating group reported the least eating pathology.

Summary. To summarize the results from the LPA, five distinct groups emerged from the analysis. As expected, individuals most likely classified within the Healthy class reported the highest levels of nutritionally and psychologically healthy eating and overall psychological health across measures. Conversely, individuals most likely belonging to the Unhealthy class reported the lowest levels of nutritionally and psychologically healthy eating and the lowest level of overall psychological health. The participants categorized within the Intuitive Eating group reported high levels of psychologically healthy eating, low nutritionally healthy eating, and a high level of overall psychological health across study measures. Individuals who most likely belong to the Dieting group were characterized by the highest levels of nutritionally healthy eating but relatively low levels of psychologically healthy eating along with a high level of dieting behaviors. Finally participants most likely classified within the Non-dieting group reported intermediate levels of psychologically and nutritionally healthy eating and low levels of dieting.

Aim #3: Investigate Group Differences on Psychologically and Nutritionally Healthy Eating

Hypothesis #6: Hispanic participants would report high levels of acculturation and score similar to Non-Hispanic participants on nutritionally healthy eating. It was of interest to investigate possible ethnic differences on the

measure of nutritionally healthy eating (HEI), as previous research found relationships between acculturation, ethnic identity, and nutritionally healthy eating. Scores on the Ethnic Identity scale of the SEE were investigated within participants identifying with Hispanic ethnicity. Higher scores on this scale indicate higher enculturation, and lower scores indicate higher acculturation. In the present sample of participants who identified as Hispanic, the mean on this scale was 2.54 (*SD*=0.69). Scores can range from 1 to 5, and past research conducted with Hispanic individuals has found higher means on this scale (typically above 3.0; Malcarne et al., 2006). This indicates that the subsample of Hispanic participants in this study endorsed a moderate level of enculturation and a moderate level of acculturation to mainstream culture.

To test the hypothesis that Non-Hispanic participants would report a similar level of nutritionally healthy eating compared to Hispanic participants, an independent samples *t*-test was run. As predicted, Hispanic participants (*M*=66.73, *SD*=7.76) were not significantly different from non-Hispanic participants (*M*=67.14, *SD*=8.00) on the HEI, $t(467)=.562$, $p>.05$. In summary, consistent with expectations, Hispanic participants reported a moderate level of acculturation and were not significantly different from Non-Hispanic participants on nutritionally healthy eating.

Hypothesis #7: Women would score higher on nutritionally healthy eating than men, but men would score higher on psychologically healthy eating than women. As previous research found gender differences on nutritionally and psychologically healthy eating, this topic was also explored. To test the hypothesis that women would score higher on nutritionally healthy eating and men would score higher on psychologically healthy eating, independent samples *t*-tests were conducted. With

regard to the measure of nutritionally healthy eating (HEI), the hypothesis was supported; women (M=51.46, SD=13.50) reported significantly higher levels of nutritionally healthy eating than men (M=45.07, SD=11.97), t(476)=-4.680, p<.001, Cohen's d=0.47.

Before conducting the gender comparison on the measure of psychologically healthy eating, the IES, measurement invariance was investigated. The transgender individual was eliminated from this analysis, as were the 19 multivariate outliers on the IES. The final sample included 344 women and 115 men, for a total sample size of 459. The configural model provided an acceptable fit to the data, χ^2(196)=513.799, p<.001, RMSEA=.084 (95% CI: .075-.093), CFI=.969, TLI=.962. Therefore, the weak invariance model was tested by constraining the factor loadings to equality across the two groups. This model was not significantly different from the configural model, χ^2_{diff}(12)=16.462, p=.17. Therefore, the strong invariance model, which constrains item intercepts to equality across groups, was run. Again, this model was not significantly different than the weak invariance model, χ^2_{diff}(57)=70.342, p=.11, indicating that measurement invariance was achieved. Investigation of the latent factor means revealed that women scored significantly lower on the Unconditional Permission to Eat and Eating for Physical Rather than Emotional Reasons subscales. This suggests that men reported 1) allowing themselves to eat until satiated and 2) responding to physiological cues rather than emotional cues to guide eating at a higher level than women. There were no significant gender differences on Reliance on Hunger and Satiety Cues and Body-Food Choice Congruence. Taken together, results were consistent with hypotheses. The measure of psychologically healthy eating was invariant across gender, and women

reported higher levels of nutritionally healthy eating and lower levels of psychologically healthy eating than men.

Hypothesis #8: Exploratory investigation of ethnic identity (and psychologically healthy eating. As the measure of psychologically healthy eating, the IES-16, was of primary interest in this study, an exploratory analysis of the relationship between ethnic identity and the IES-16 was conducted. Previous research had found ethnic differences on nutritionally healthy eating when comparing Caucasian participants to Hispanic participants, but to our knowledge, no research had investigated such ethnic differences in psychologically healthy eating. To test whether Caucasian participants scored differently than Hispanic participants on the IES-16, measurement invariance analyses were performed in the same manner described for Hypothesis #5, but with ethnic group as the main grouping variable rather than gender. The 19 multivariate outliers on the IES-16 were again eliminated. Additionally, nine individuals who indicated that their ethnicity was unknown were not included in the analysis. The final sample included 208 individuals who identified as Non-Hispanic and 243 individuals identifying as Hispanic, for a total sample size of 451.

The configural model provided an adequate fit to the data, $\chi^2(199)=547.46$, $p<.001$, RMSEA: .088 (95% CI: .079-.097), CFI: .97, TLI: .96. Consequently, the weak invariance model was run; however, this model provided a significantly worse fit compared to the configural model, $\chi^2_{diff}(16)=41.44$, $p<.001$. Modification indices indicated that lack of model fit was partially due to the fact that almost half of the items loaded on different factors across the two groups. Therefore, partial invariance was not pursued and the analysis was stopped. Thus, the factor loadings were non-invariant across

groups due to widespread differences across the two ethnic groups, and measurement invariance was not achieved. This indicates that it is not valid to make mean comparisons across the two ethnic groups on the IES-16.

Chapter 4

Discussion

The first main aim of this study was to investigate the construct of psychologically healthy eating. Specifically, items were added to the Intuitive Eating Scale-2 (IES-2) assessing moderation, flexibility, and enjoyment in eating in an attempt to broaden the IES-2 and improve its construct validity as a measure of psychologically healthy eating. However, this hypothesis was not supported, and the factor structure of the added scales was problematic. Therefore, the IES-2 was investigated via factor analyses. This resulted in a 16-item version of the IES-2 (referred to subsequently as the IES-16) that was utilized as the main measure of psychologically healthy eating in the study.

The second major aim of this study was to test whether nutritionally healthy eating and psychologically healthy eating could be combined into a two-factor theory of healthy eating in a sample of college students. The relationship between nutritionally healthy eating and psychologically healthy eating was tested; as expected, these two constructs were orthogonal. The two-factor theory of healthy eating predicts that individuals can be meaningfully categorized according to their levels of nutritionally and psychologically healthy eating. This prediction was tested via a latent profile analysis (LPA) to investigate whether the expected groups emerged. Five classes emerged from the LPA, three of which coincided with *a priori* hypotheses.

A secondary aim of this study was to investigate group differences on measures of psychologically healthy eating and nutritionally healthy eating. It was hypothesized that the IES-16 would be invariant across gender and ethnicity (Non-Hispanic and Hispanic

groups). Results supported the measurement invariance of the IES-16 across gender but not ethnicity. Additionally, it was hypothesized that women would score higher on the HEI relative to men; this hypothesis was supported.

Psychologically Healthy Eating

Factor structure of the PHE. The first hypothesis concerned the factor structure of the newly developed PHE, which attempted to add three factors (moderation, flexibility, and enjoyment) to the IES. Confirmatory and exploratory analyses were unable to produce a satisfactory factor structure on this measure. Many of the items failed to load onto any factors, and the internal consistency reliability of the added items was unacceptably low. Ultimately, an exploratory analysis of the IES-2 resulted in the only acceptable model. This indicates that the attempt to operationalize moderation, flexibility, and enjoyment was not successful, as these three factors did not emerge in the factor analyses.

There are several possible reasons why scales measuring moderation, flexibility, and enjoyment did not improve the performance of the IES-2. During exploratory factor analyses, many of the "moderation" items loaded either onto the Reliance on Hunger and Satiety Cues (RHSC) scale of the IES-2, or negatively onto the Unconditional Permission to Eat (UPE) scale. This indicates that the construct of moderation might already be captured within the RHSC and UPE scales of the IES-2. This idea is consistent with one previous study that concluded that the construct of moderation is similar to that of intuitive eating (Stotland, 2012).

A second possibility is that the three constructs are not particularly relevant for psychologically healthy eating. Several of the items reflecting the "enjoyment" and

"flexibility" constructs did not load onto any factors during factor analyses. It may be that food enjoyment in its extreme can become unhealthy, potentially resulting in overeating and/or responding to hedonic hunger cues. If this problematic food enjoyment was reflected in participants' responses, it could explain why this factor did not emerge in factor analyses of the PHE. This idea is consistent with the goal conflict model of eating behavior, which suggests that the goal of enjoying one's food often conflicts with the goal of weight loss. As a result, the desire to enjoy food can lead to dieting lapses and unhealthy eating (Stroebe, 2013).

Finally, the three scales developed to measure food enjoyment, moderation, and flexibility may not reflect unified constructs. For example, items on the flexibility scale attempted to measure: 1) the ability to adapt to changing circumstances while making sure nutrition needs were met as well as, 2) the ability to eat a range of foods, even when their calorie content is unknown. It may be that this operationalization of the construct of flexibility was too multifaceted to emerge as a single factor during factor analyses. The broader construct of "psychological flexibility" is thought to be a dynamic process that draws on several different skills, including mindfulness, acceptance, and the ability to recognize changing contexts and adapt behavior appropriately (Kashdan & Rottenberg, 2010). It may be that the concept of flexibility involves a variety of different skills and behaviors, making it difficult to measure within a single scale.

In summary, it appears that the IES-2 sufficiently captures the construct of psychologically healthy eating, or a healthy eating process, and may not require additional scales. In support of this idea, the 16-item version of the IES found in this sample demonstrated good convergent and discriminant validity. It was positively

correlated with psychological health on the MHI, uncorrelated with nutritionally healthy eating on the Healthy Eating Index (HEI), and negatively correlated with variables theoretically expected to be inversely related to the IES. These included emotional eating, hedonic hunger, unhealthy dieting strategies, disordered eating, and body dissatisfaction. Importantly, the 16-item IES was negatively correlated with BMI. In fact, the correlation between the 16-item IES and BMI was stronger than that between nutritionally healthy eating on the HEI and BMI. Consistent with this idea, previous research has concluded that intuitive eating is more than simply an absence of disordered eating, but rather an articulation of a unique construct. In fact, recent work by the developers of the IES-2 confirmed that three of the subscales of the IES-2 predicted unique variance in measures of psychological health over and above measures of disordered eating. The authors concluded that these three subscales are distinct from disordered eating, and measure adaptive eating (Tylka & Kroon Van Diest, 2013). This supports the conclusion that the IES is a valid measure of psychologically healthy eating. Therefore, the analyses proceeded using the 16-item IES as the measure of psychologically healthy eating (eating process) rather than the full PHE.

Factor Structure of the IES-2. The exact factor structure of the IES-2 found by its developers, a 4-factor, 23-item structure (Tylka & Kroon Van Diest, 2013), was not replicated in this sample. Seven items were eliminated from the model due to cross-loadings or a failure to load on any factors. That said, the four latent factors found in this sample strongly resembled the factors initially found in the IES, but in a shorter form. Although the sample in this study was quite similar to the one recruited in the original study (a university sample), the present sample included substantial ethnic diversity, with

the majority of participants identifying as Hispanic. This may account for the somewhat different factor structure found here.

Indeed, the current study failed to demonstrate measurement invariance across Hispanic and Non-Hispanic ethnic groups, indicating the presence of ethnic differences in how participants respond to the measure. This finding is consistent with previous research investigating the factor structure of the IES-2 in a French sample, which found a different factor structure from that detected in the original validation study (Camilleri et al., 2015). More broadly, recent cross-cultural investigations of eating-related measures have either failed to replicate the original factor structure of the measure in ethnically diverse samples, or failed to find measurement invariance (Belon et al., 2011, 2014). This highlights the role that culture plays in eating behavior, and may indicate that eating-related measures will not necessarily be directly comparable across different cultures.

Gender differences on the IES-16. This study also investigated gender differences on the IES-16. Past research demonstrated measurement invariance of the 23-item version of the IES-2 across gender, and also found that men scored higher on the IES-2 compared to women (Camilleri et al., 2015; Tylka & Kroon Van Diest, 2013). In the current study, the IES-16 again demonstrated measurement invariance across men and women. Not only is the factor structure of the measure similar across men and women, but the unit of measurement is the same, indicating that men's and women's scores on the measure can be directly compared (Chen et al., 2005). The fact that measurement invariance across gender was replicated in this sample may mean that the IES is generally invariant across gender among college samples.

Given that the IES-16 showed measurement invariance across gender, gender comparisons on the subscales of the IES-16 were conducted. Men scored significantly higher on latent levels of the Unconditional Permission to Eat (UPE) and Eating for Physical Rather than Emotional Reasons (EPR) factors. There were no gender differences on latent levels of Body-Food Choice Congruence (BFCC) or Reliance on Hunger and Satiety Cues (RHS). Some research indicates that women experience higher levels of pressure to be thin compared to men (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999); this pressure can translate into body dissatisfaction, which predicts increased dieting behavior (Stice, 2001). Dieting behavior has been conceptualized as a reliance on cognitive rules to guide eating, and is associated with decreased awareness of internal cues and with increases in emotional eating (Ogden & Wardle, 1990; Polivy & Herman, 1985). Not surprisingly, this may lead to lower scores on intuitive eating (Tylka & Kroon Van Diest, 2013). Specifically, relying on cognitive rules to guide eating is conceptually consistent with lower scores on UPE, and increased eating in response to emotional cues is the construct that EPRE attempts to measure. In sum, the gender differences observed in the present study may be attributable to the increased pressure for thinness and resultant dieting that some women experience.

Nutritionally Healthy Eating: The Healthy Eating Index

The HEI was the measure of nutritionally healthy eating utilized in this study. Consistent with past research in young adult samples, the level of nutritionally healthy eating reported by participants was low (Guenther et al., 2014). In fact, less than 3% of participants reported eating a diet in the "healthy" range on the HEI. On average, participants reported eating less than the daily recommended values for fruit, vegetables,

whole grains, and dairy. In addition, participants reported eating unhealthy levels of fat, sodium, refined grains, and empty calories. The only scale where the mean was close to recommendations was protein.

Previous studies found that less acculturated Hispanic individuals reported diets that were nutritionally healthier than those reported by Caucasian individuals (Aldrich & Variyam, 2000; Guendelman & Abrams, 1995), whereas more highly acculturated Hispanic groups reported similar diet quality to Caucasian groups. The findings from the present study were consistent with this finding. The sample of Hispanic participants in this study reported a medium level of acculturation, and no ethnic differences were found on the HEI. Past research also found gender differences on the HEI, with women reporting higher levels of nutritionally healthy eating (Ervin, 2011; Forshee & Storey, 2006; Hiza et al., 2013). This finding was replicated in the current study, with women reporting, on average, a diet that was almost one half of a standard deviation healthier than men.

If the HEI is a valid measure of diet quality, it should be negatively associated with obesity. This association has been verified in past research (Tande et al., 2010), and indeed, the current study found a small but significant negative correlation between HEI scores and BMI. The fact that the relationship is so small can be explained by measurement error in instruments assessing dietary intake. Research indicates that significant reporting bias exists across methods attempting to measure dietary intake. This bias, or measurement error, makes it more difficult to detect relationships between diet and other variables, essentially decreasing power (Kipnis et al., 2002). However, there is some evidence that 24-hour recalls (the method utilized in this study) have less

error than other measures of dietary intake (Subar et al., 2003). Many studies included only one or two recalls (e.g., Tande et al., 2010; Vollmer, Adamsons, Gorin, Foster, & Mobley, 2015), which can further decrease power due to high levels of error in estimating each individual's typical daily dietary intake. In order to decrease measurement error, the current study included four separate 24-hour recalls. Furthermore, the fact that measures of dietary intake are consistently associated with *decreased* power means that it is difficult to interpret insignificant results. The present study found significant relationships between HEI scores, gender, and BMI *in spite of* this decreased power, which may indicate that the true effect sizes are larger than the ones reported here.

A Two-Factor Theory of Healthy Eating: Psychologically and Nutritionally Healthy Eating

The main analysis in the current study was a Latent Profile Analysis (LPA) that included indicators of psychologically healthy eating (the four IES-2 subscales) and nutritionally healthy eating (moderation and adequacy scales on the HEI). Although the original hypothesis predicted the presence of four groups, five distinct classes emerged. These classes will be discussed starting with the group reporting the highest level of overall health (high psychologically healthy eating + high nutritionally healthy eating) and ending with the lowest level of overall health (low psychologically healthy eating + low nutritionally healthy eating). It is important to remember that LPA produces classes that are probabilistic; thus, each class consists of individuals who *most likely* belong to that class, but there is error in categorization of individuals.

"**Healthy" class.** Individuals who most likely belonged to the first class, called the Healthy class (n=44; 9.2%), were overall the "healthiest" as they reported high levels

of nutritionally healthy eating, psychologically healthy eating, psychological health, and a healthy BMI. Additionally, members of this class had low scores on variables relating to eating disorders (body dissatisfaction, disordered eating, hedonic hunger, emotional eating, and unhealthy dieting). This group combines a healthy eating process with healthy eating content, coming closest to the two factor model of healthy eating. Future research could characterize this group more thoroughly, and investigate which strategies these individuals use to maintain their high level of health. It is possible that this group could serve as a model for future healthy eating/weight loss interventions. Specifically, this group scored high on intuitive eating and reported a relatively high number of healthy dieting behaviors. For example, the majority of the individuals in this class reported exercising, eating more fruits and vegetables, and limiting high-fat and sweet foods in order to control their weight. Given previous research finding that dieting is associated with decreases in variables associated with intuitive eating (Denny et al., 2013; Ogden & Wardle, 1990), this group suggests that it might be possible to both eat intuitively (i.e., have a healthy eating process) and engage in healthy dieting. Interestingly, while almost all of the members of this group reported engaging in a variety of healthy dieting strategies, less than half reported that they were dieting to lose weight. It may be that this group engages in healthy dietary strategies with the goal of eating a healthier diet rather than with the goal of weight control.

"Intuitive Eating" class. The individuals who most likely belonged to the Intuitive Eating class (*n*=24; 5.0%) were characterized by extremely high levels of intuitive eating. Interestingly, this class had the lowest level of nutritionally healthy eating across the various scales of the HEI. To characterize their low level of

nutritionally healthy eating on the HEI, the individual HEI scales were examined. Overall, this group reported very low levels of fruit, vegetable, whole grain, and dairy intake. They reported very high levels of fat, sodium, and refined grains. Strikingly, despite their low level of nutritionally healthy eating, this group also reported the lowest BMI. This finding was surprising, as it was expected that the group high on psychologically healthy eating and low on nutritionally healthy eating would fall in the overweight BMI category. These individuals reported a high level of psychological health, and very low levels of disordered eating-related behaviors (body dissatisfaction, emotional eating, hedonic hunger, unhealthy dieting, and disordered eating). This group is important for theoretical reasons, as it seems to contradict the idea that healthy food content is necessary for a healthy weight. Specifically, it may be that psychologically healthy eating is as important as nutritionally healthy eating (or more) for health outcomes.

There are several possible explanations for why this group reported both the least nutritionally healthy diet and the healthiest BMI. One possibility is that, by eating intuitively, this group is able to eat unhealthy foods in small enough quantities to maintain energy balance. Consistent with this idea, portion control is now accepted as an effective component of weight loss plans (Rolls, 2014; Young & Nestle, 2002). And one observational study found that obese and normal-weight individuals reported eating similar foods, but normal-weight individuals reported smaller portion sizes (Berg et al., 2009).

Another possible explanation for the Intuitive Eating group's poor nutritional health and healthy body weight is biology. The role of biology in obesity is well-

established (Friedman, 2009; Hetherington & Cecil, 2010). Conceivably this group is biologically predisposed toward thinness, and does not have to exercise dietary restraint or healthy eating strategies to maintain a healthy weight. In fact, it could be that this biological predisposition toward thinness causes intuitive eating, as these individuals learn that they can eat unhealthy foods without gaining weight.

"Non-dieting" class. For the third class, comprised of individuals who most likely belonged to the Non-dieting group (*n*=230; 48.0%), the predominant picture was one of intermediate levels on almost all of the variables. Notably, the Non-dieting group comprised almost half of the sample and had one of the lowest levels of nutritionally healthy eating and a low level of dieting. This class likely represents the "average" college student who is neither dieting nor eating in an intuitive manner, and who has a low level of nutritional health. In support of this idea, the Non-dieting group's scores on the 16-item version of the IES-2 were almost identical to those reported previously in a college sample of men and women (Tylka & Kroon Van Diest, 2013). Furthermore, the Non-dieting group had the highest proportion of individuals falling into the "poor" category on the HEI (185 of 230 or 80.4%), with only the exception of the Intuitive Eating group. This is consistent with research indicating that college-age adults engage in a wide variety of unhealthy dietary behaviors, such as increased fast food intake (Niemeier, Raynor, Lloyd-Richardson, Rogers, & Wing, 2006), increased sugary beverage intake (Nielsen & Popkin, 2004), and decreased fruit and vegetable intake (Larson, Neumark-Sztainer, Hannan, & Story, 2007). In line with this finding, the Non-dieting group reported a very high intake of empty calories and a very low fruit and vegetable intake on the HEI. Due to its poor nutritional health, this group may be at risk

for future overweight, although the average current BMI for this group fell in the normal weight range (Aljadani, Patterson, Sibbritt, & Collins, 2015). Thus, this group is a potential target for healthy eating interventions, especially given that dietary habits are thought to change as emerging adults enter college, and these habits may become relatively entrenched over time (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008).

"Dieting" class. Individuals who most probably belong to the Dieting class (*n*=113; 23.6%) generally responded in a manner consistent with individuals who are dieting and somewhat weight-preoccupied. This group reported the highest level of nutritionally healthy eating, along with moderate elevations on disordered eating-related variables (body dissatisfaction, hedonic hunger, emotional eating, disordered eating, and unhealthy and healthy dieting). This group, with its average BMI, may represent those individuals who report that they are dieting, despite the fact that they are not necessarily achieving weight loss (Stice, Sysko, Roberto, & Allison, 2010). Consistent with this idea, this class reported following more weight loss diets in the past year than any of the other classes, and over three quarters reported engaging in at least one weight loss diet in the past year. For those who did not endorse any weight loss diets, it may be that they were dieting to maintain their weight.

The fact that this group was high on variables such as body dissatisfaction, hedonic hunger, emotional eating, disordered eating, and healthy and unhealthy dieting is consistent with restraint theory. According to restraint theory, restrained eaters exercise cognitive control over eating in attempts to lose weight. This cognitive control, when violated, can lead to disinhibition (Polivy & Herman, 1985). More recent research

suggests that there is heterogeneity among restrained eaters, and that body dissatisfaction, as opposed to restraint, may be the true cause of disinhibition (Johnson & Wardle, 2005). It may be that the Dieting group identified here represents the group of individuals that restraint theory originally described. Specifically, this group appears to report high levels of body dissatisfaction and high levels of dieting along with elevated hedonic hunger, emotional eating, and disordered eating.

"Unhealthy" class. Finally, those individuals who were determined to most likely belong to the Unhealthy class (*n*=49; 10.2%) had scores consistent with individuals with either diagnosable or subthreshold eating disorders. Specifically, they scored low on all measures relating to overall health (psychologically healthy eating, nutritionally healthy eating, psychological health) and highest on all measures relating to disordered eating (body dissatisfaction, emotional eating, hedonic hunger, dieting, and disordered eating). Similar to the other groups scoring low on nutritionally healthy eating, this group reported low levels of fruit, vegetable, whole grain, and dairy intake, and high levels of sodium, refined grains, and empty calories. The Unhealthy group also had by far the highest BMI, which was in the overweight range. This finding of an overweight BMI is consistent with the presence of disordered eating symptoms such as binge eating (De Zwaan, 2001; Neumark-Sztainer et al., 2006), as well as with an unhealthy diet (Aljadani et al., 2015).

Summary. Overall, three of the four expected groups emerged: 1) high nutritionally healthy eating + high psychologically healthy eating (Healthy class); 2) low nutritionally healthy eating + high psychologically healthy eating (Intuitive Eating class); 3) low nutritionally healthy eating + low psychologically healthy eating (Unhealthy class;

see Figure 2). The only predicted group that did *not* emerge was the high nutritionally healthy eating + low psychologically healthy eating group. Instead, a high nutritionally healthy eating + *average* psychologically healthy eating group (the Dieting class) was found. And in addition, a fifth group was detected, the Non-dieting group, which was characterized by average levels on most variables, along with a low level of dieting and nutritional health.

Implications and Discussion

Unconditional permission to eat. One of the purposes of this study was to further explore the potentially controversial Unconditional Permission to Eat (UPE) subscale of the IES-2, which measures a tendency to eat food of any type until hunger is satisfied. This construct is in opposition to the concept of dietary restraint (Tylka & Kroon Van Diest, 2013). Interestingly, individuals most likely belonging to the Healthy class scored high on all of the IES-2 subscales except UPE. In contrast, participants most likely classified within the Intuitive Eating group scored high on all of the IES-2 scales except Body-Food Choice Congruence (BFCC), which reflects a tendency to eat nutritious foods. This finding was consistent with the Intuitive Eating group's low nutritional health. It may be that eating a nutritionally healthy diet requires a certain amount of dietary restraint. In support of this idea and prior research (Tylka & Kroon Van Diest, 2013), UPE and BFCC were negatively correlated in the final model of the IES-2, signifying that those participants who reported more UPE also reported eating healthy foods less often. This is consistent with research showing that flexible restraint, or utilizing healthy dieting strategies, predicts a nutritionally healthy diet (Swan, Bouwman, Hiddink, Aarts, & Koelen, 2015). Finally, the Intuitive Eating group reported

the lowest level of restraint on the Restraint scale of the EDEQ, whereas the Healthy group reported a moderate amount of restraint. In summary, it may be that high levels of UPE are incompatible with eating a nutritionally healthy diet, which is problematic for a measure of psychologically healthy eating.

Dieting controversy. On a larger scale, the finding that individuals classified within the Healthy group report moderate levels of restraint speaks to the current controversy within the field regarding dieting and non-dieting approaches. It may be that some amount of dieting (i.e., cognitive control over eating) aimed toward eating a healthy diet in the context of high levels of the other aspects of intuitive eating may actually be healthy. The idea that some dieting may be healthy is consistent with the research finding that weight loss programs lead to increased cognitive eating restraint (Urbanek, Metzgar, Hsiao, Piehowski, & Nickols-Richardson, 2015) and also result in decreased binge eating (Dalle Grave, Calugi, Petroni, Di Domizio, & Marchesini, 2010). It is also in line with Lowe and Levine's (2005b) suggestion that some cognitive control over eating may be necessary to curb hedonic hunger and prevent weight gain in today's food-rich environment.

The group of individuals who most likely belonged to the Intuitive Eating group reported high levels of intuitive eating and low levels of dieting, yet had the lowest BMI of any group, suggesting a different idea entirely. Rather than implying that dieting may be healthy, this group suggests that dieting may be the problem, and intuitive eating may be the solution. However, given that this group had the lowest level of nutritional health, it will be important to investigate long-term health outcomes for this group before making broad statements about dieting behaviors.

Intuitive eating and obesity. The underlying assumption behind the suggestion that intuitive eating might be used as an obesity intervention is that the root cause of obesity may be a diminished ability to follow hunger and satiety cues to guide eating. If this assumption is correct, it would logically follow that improving one's ability to eat intuitively might treat or prevent

obesity. In support of this idea, research indicates that obese individuals report lower levels of intuitive eating (Denny et al., 2013; J. B. Webb & Hardin, 2012) when compared to normal weight individuals. Along these lines, severely obese individuals report higher levels of hedonic hunger than nonobese individuals (Schultes, Ernst, Wilms, Thurnheer, & Hallschmid, 2010). If hedonic hunger is conceptualized as an external (i.e., non-physiological) cue to eat, then intuitive eating interventions that emphasize not eating in response to hedonic hunger might effectively treat obesity.

An alternative possibility is that obesity is caused by a biological predisposition toward problematic hunger and satiety cues (e.g., excessive hunger cues and decreased satiety cues), and that the elevated dietary restraint observed in obese samples reflects a response to this biological predisposition (Lowe & Levine, 2005). It is well-accepted that biology contributes to the development of obesity (Hetherington & Cecil, 2010; Loos, 2009), and a recent review argues that the genetic contribution to obesity occurs via metabolic as well as appetitive mechanisms (Carnell, Kim, & Pryor, 2012). Specifically, it may be that obese individuals have increased appetitive response to food, as well as blunted satiety signals after ingesting food, when compared to normal weight adults (Carnell et al., 2012). Thus, it may be that individuals become obese by responding to hunger and satiety cues that lead to a positive energy balance and subsequent weight

gain. If this is the case, then individuals affected by obesity may not benefit from responding to their hunger and satiety cues. Instead they may need to exercise cognitive restraint over eating to achieve a healthy weight (Lowe & Levine, 2005).

Intuitive eating and disordered eating. Since it appears that intuitive eating captures the construct of "psychologically healthy eating," there are potential implications for eating disorder treatment. The dietary restriction and binge eating seen in many individuals with eating disorders may reflect an underlying disruption in the ability to eat intuitively (Craighead & Allen, 1995). It is possible that specific training in intuitive eating could improve eating disorder treatment. Several interventions that are consistent with the ideas behind intuitive eating have been implemented in samples of individuals with disordered eating.

Appetite Awareness Training (AAT) is an intervention that was developed to treat BED. AAT focuses on restoring awareness of hunger and satiety cues by instructing participants to monitor hunger and fullness. AAT emphasizes eating in response to hunger/satiety cues rather than in response to negative emotions or when one has violated dietary rules, and in this way is consistent with the principles of intuitive eating. AAT effectively decreased disordered eating symptoms among patients with BED (H. N. Allen & Craighead, 1999) and patients with symptoms of bulimia (Hill, Craighead, & Safer, 2011). However, while AAT's emphasis on restoring awareness of hunger and satiety signals is certainly consistent with intuitive eating, it does not necessarily address all aspects of intuitive eating, such as unconditional permission to eat and body-food choice congruence.

When applied to eating, mindfulness is associated with increased awareness of hunger and satiety cues (Kristeller, Wolever, & Sheets, 2014), and is therefore consistent with intuitive eating. A recent exploratory review concluded that mindfulness-based interventions show promise for treating disordered eating (Wanden-Berghe, Sanz-Valero, & Wanden-Berghe, 2011). However, several of the studies included in the aforementioned review targeted mindfulness more generally rather than focusing on mindful eating specifically. One mindfulness-based intervention that does focus on mindful eating is called Mindfulness Based Eating Awareness Training (MB-EAT). Similar to AAT, MB-EAT focuses on eating in response to hunger/satiety cues rather than in response to external cues, but differs from AAT in its focus on mindfulness more broadly. While there is preliminary evidence for the effectiveness of MB-EAT in treating disordered eating (Kristeller et al., 2014), it is not clear how MB-EAT performs in comparison with established treatments for EDs such as CBT-E.

While interventions such as AAT and MB-EAT appear to be consistent with the concept of intuitive eating, it does not appear that explicit training in intuitive eating as a treatment for disordered eating has been investigated. Future research could test whether such interventions are effective at treating EDs either as stand-alone treatments or as adjuncts to ED treatment. Additionally, AAT and MB-EAT emphasize increasing awareness of hunger/satiety cues and not eating in response to non-hunger cues such as negative emotions. However, it does not appear that AAT or MB-EAT attempt to incorporate the concept of hedonic hunger. As research shows that hedonic hunger is associated with binge eating (Witt & Lowe, 2014), it may be important to incorporate the concept of hedonic hunger into intuitive eating interventions in order to address non-

physiological cues to eat. Such interventions could point out that the presence of palatable food can induce eating in the absence of true physiological hunger in a manner similar to negative emotions.

Strengths, Limitations and Future Directions

Strengths of this study included the ethnic and gender diversity, the high quality of dietary data collected, the high retention rate (80%), and the unique measure of dieting that was utilized. Whereas the sample in the present study was composed largely of ethnic minority students and included men, previous research on the IES-2 recruited samples that were over 80% White (Tylka & Kroon Van Diest, 2013), and past research on disordered and healthy eating focused on women (Darcy & Lin, 2012; Tylka & Wilcox, 2006). With regard to quality of dietary recall data, most research utilizing dietary recalls collects fewer than four 24-hour recalls (e.g., Frankenfeld, Poudrier, Waters, Gillevet, & Xu, 2012; Guenther et al., 2014; Moshfegh et al., 2008) and achieves a retention rate between 70 and 80% (e.g., Frankenfeld et al., 2012; Moshfegh et al., 2008). Additionally, the fact that this study included a measure of unhealthy as well as healthy dieting made it possible to detect different associations between these two constructs. It may be important to distinguish between types of dieting (Neumark-Sztainer, Jeffery, & French, 1997), as this may further address the controversy between dieting and non-dieting approaches. Finally, the measures utilized in this study all demonstrated very high internal consistency reliability.

This study had several limitations. First, the measure of ethnic identity, the Scale of Ethnic Experience (SEE), was chosen because it is a relatively recent measure that is appropriate for individuals of any ethnic/racial group (Malcarne et al., 2006). However,

the SEE does not directly measure acculturation. Rather, the Ethnic Identity subscale, which measures enculturation, can be used to infer acculturation, presumably under the assumption that the two variables are inversely related. However, some research has questioned this assumption, claiming that acculturation and enculturation are actually orthogonal processes (Oetting & Beauvais, 1990). Thus, it is difficult to gauge with confidence the true level of acculturation experienced by the Hispanic sample within this study. Future research should include measures with specific scales assessing acculturation. Furthermore, future research might recruit participants from certain specific ethnic and/or cultural groups; the present study grouped participants into broad and potentially heterogeneous categories, "Hispanic" and "Non-Hispanic" groups. This heterogeneity may have made it more difficult to detect specific cultural/ethnic differences.

This study was cross-sectional in nature, thus it is difficult to make strong conclusions regarding the five classes of participants that emerged during the LPA. Future research should investigate whether hypotheses regarding these groups hold true over time. For example, one would expect that individuals most likely classified within the Healthy group would maintain a healthy weight, while individuals most likely classified within the Unhealthy group would not. Additionally, the Healthy group reported both a healthy eating content and process along with a high level of overall health. Consequently, future research should investigate this group in order to better characterize it, as this potentially could lead to future healthy eating interventions. Also, it is important to note that class membership within LPA is probabilistic. The measure of entropy for the LPA presented here was just above the "acceptable" threshold (Tein et al.,

2013), indicating that participants were classified with some error. This underlines the importance of verifying the classes based on some outside criterion, such as health outcomes. Longitudinal studies assessing the relationships between obesity, intuitive eating, and nutritionally healthy eating are needed in order to make causal attributions between these variables. Future research also should include experimental studies adding intuitive eating interventions as an adjunct to obesity and eating disorder treatments, and should attempt to incorporate the concept of hedonic hunger into these interventions.

This study recruited college students exclusively, and so future research should attempt to replicate these findings across different samples. Specifically, research should determine whether these results replicate with adolescents, community samples of adults, weight-loss seeking populations, or older adults. Finally, while participants did not know in advance when they would be prompted to complete a 24-hour recall, they did enroll in a study investigating "Eating in College Students." Consequently it is possible that participants altered their eating habits somewhat while participating in the study. Finally, as is the case with any study investigating dietary content, the issue of self-report remains a potential confound.

Summary and Conclusions

In summary, this study adds to our understanding of the nature of psychologically healthy eating by suggesting that intuitive eating provides an adequate operationalization of this construct. In addition, our findings suggest that it is possible to categorize young adults according to psychologically and nutritionally healthy eating. The groups that emerged in this study suggest: 1) that it may be possible to eat in a psychologically healthy manner and exercise healthy weight control behaviors, and 2) that it may be

possible to improve disordered eating and obesity treatments by providing explicit training in psychologically healthy eating. Additionally, findings from this study suggest that it may be important to incorporate the concept of hedonic hunger into the theory of intuitive eating.

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Table 1. Demographics in the Overall Sample (*N*=479)

	M (*SD*)	Range
Age	20.83 (3.87)	18 – 40
BMI	23.9 (5.0)	14.9 – 47.0
	N (%)	
Gender		
Female	353 (73.7)	
Male	125 (26.1)	
Transgender	1 (0.2)	
Ethnicity		
Not Hispanic, Latino, or Spanish origin	219 (45.7)	
Mexican, Mexican American, Chicano	98 (20.5)	
Another Hispanic, Latino, or Spanish origin	152 (31.7)	
Race		
White	288 (60.1)	
Other	98 (20.5)	
American Indian/Alaskan Native	27 (5.6)	
More than one race	23 (4.8)	
Black/African American	17 (3.5)	
Asian	15 (3.1)	
Unavailable/Unknown	11 (2.3)	
Marital Status		
Never Married	398 (83.1)	
Cohabitating with a Partner	45 (9.4)	
Married	30 (6.3)	
Divorced	6 (1.3)	
Living Situation		
Live with Roommates	182 (38.0)	
Live with Parents	173 (36.1)	
Live with Significant Other	70 (14.6)	
Live Alone	54 (11.3)	
Sexual Orientation		
Heterosexual	448 (93.5)	
Bisexual	21 (4.4)	
Gay/Lesbian	10 (2.1)	
BMI Category		
Normal Weight	310 (64.7)	
Overweight	82 (17.1)	
Obese	56 (11.7)	
Underweight	31 (6.5)	
Food Allergy	73 (15.2)	
Special Diet	34 (7.1)	
Medical Condition Affecting Eating	30 (6.3)	

Table 2. Summary of Hypotheses and Results

Aim #1: Investigate the construct validity of the measure of psychologically healthy eating.

Hypothesis #1: A confirmatory factor analysis of the measure of psychologically healthy eating would provide support for its construct validity. The factor structure of the PHE was not supported. The factor structure of the IES-2 was explored and a 4-factor, 16-item version of the IES resulted. This factor structure was similar to the original 4-factor, 23-item factor structure.

Hypothesis #2: Adding items on food enjoyment, moderation, and flexibility to the Intuitive Eating Scale-2 would provide incremental validity. As the factor structure of the PHE was not supported, the IES-16 was utilized as the main measure of psychologically healthy eating. Therefore, the incremental validity of the PHE over the IES-2 was not assessed.

Hypothesis #3: The measure of psychologically healthy eating would demonstrate convergent and discriminant validity. As expected, the IES-16 correlated negatively with BMI, emotional eating, hedonic hunger, disordered eating, body dissatisfaction, and unhealthy dieting. Additionally, the IES-16 was positively correlated with overall psychological health.

Aim #2: Investigate the two-factor theory of healthy eating.

Hypothesis #4: Nutritionally and psychologically healthy eating would be orthogonal. As hypothesized, nutritionally healthy eating on the HEI and psychologically healthy eating on the IES-16 were not significantly correlated.

Hypothesis #5: Nutritionally and psychologically healthy eating can be used in a two-factor categorization of healthy eating. Latent profile analyses resulted in five classes or subgroups, three of which corresponded with hypotheses. The **Healthy** group reported high levels of psychologically and nutritionally healthy eating and psychological health. The **Intuitive Eating** group reported high levels of psychologically healthy eating and psychological health but low levels of nutritionally healthy eating. The **Non-dieting** group reported intermediate levels of psychologically and nutritionally healthy eating and low levels of dieting. The **Dieting** group reported low levels of psychologically healthy eating, high levels of nutritionally healthy eating, and a high level of dieting. Finally, the **Unhealthy** group reported low levels of psychologically and nutritionally healthy eating and psychological health.

Aim #3: Investigate group differences on psychologically and nutritionally healthy eating.

Hypothesis #6: Hispanic participants would report high levels of acculturation and score similar to Non-Hispanic participants on nutritionally healthy eating. As predicted, the Hispanic group in the study reported a moderate level of acculturation and was not significantly different from the Non-Hispanic group on the HEI, the measure of nutritionally healthy eating.

Hypothesis #7: Women would score higher on the nutritionally healthy eating than men, but men would score higher on psychologically healthy eating than women. The IES-16 was invariant across gender, indicating it was valid to make mean comparisons across men and women. Women scored significantly lower on two of the four scales of the IES-16.

Hypothesis #8: Exploratory investigation of ethnic identity and psychologically healthy eating. The IES-16 demonstrated configural invariance but did not achieve weak measurement invariance across ethnic group, indicating it is not valid to make mean comparisons on psychologically healthy eating across ethnic groups.

Table 3. Descriptive Statistics for the Overall Sample (*N*=479), Females (*n*=353), and Males (*n*=125)

	Overall		Female		Male	
	M	*SD*	*M*	*SD*	*M*	*SD*
Intuitive Eating Scale-2	3.01	0.47	2.98	0.47	3.11	0.46
Unconditional Permission	3.34	0.74	3.29	0.73	3.51	0.75
Eating for Physical Rather Than Emotional Reasons	3.44	0.83	3.35	0.83	3.71	0.77
Reliance on Hunger and Satiety Cues	3.53	0.75	3.55	0.73	3.47	0.83
Body-Food Choice Congruence	3.52	0.86	3.53	0.85	3.47	0.89
Mental Health Inventory	159.59	28.40	158.33	28.70	163.33	27.35
Body Shape Questionnaire	88.77	39.67	96.17	39.46	68.10	32.42
Dutch Eating Behavior Questionnaire-Emotional Eating Scale	2.06	0.89	2.13	0.89	1.85	0.84
Power of Food Scale	2.25	0.86	2.26	0.86	2.24	0.87
Dieting and Weight Control Behavior Checklist						
Healthy	2.82	1.46	3.02	1.37	2.26	1.58
Unhealthy	1.17	1.60	1.29	1.67	0.82	1.31
Scale of Ethnic Experience						
Ethnic Identity	2.72	0.70	2.66	0.69	2.86	0.71
Social Affiliation	3.46	0.76	3.51	0.75	3.31	0.77
Perceived Discrimination	3.19	0.78	3.15	0.78	3.27	0.74
Mainstream Comfort	2.38	0.73	2.38	0.72	2.39	0.77
Eating Disorder Examination Questionnaire– Global Score	2.54	1.32	2.71	1.34	2.09	1.17
Healthy Eating Index Total	49.78	13.39	51.46	13.50	45.07	11.97
Intuitive Eating Scale – 16	3.48	0.52	3.45	0.52	3.57	0.52
Unconditional Permission	3.32	0.83	3.26	0.81	3.51	0.86
Eating for Physical Rather Than Emotional Reasons	3.47	0.81	3.39	0.82	3.71	0.76
Reliance on Hunger and Satiety Cues	3.57	0.81	3.61	0.78	3.46	0.86
Body-Food Choice Congruence	3.52	0.86	3.53	0.85	3.47	0.89

Table 4. Fit Indices for Latent Profile Analysis

Classes	Entropy	aBIC	BIC	LRT	*p*	BLRT	*p*
2	0.773	11648.47	11708.77	350.34	<.001	358.51	<.001
3	0.809	11536.51	11619.03	129.63	.038	132.66	<.001
4	0.778	11451.64	11556.37	103.18	.009	105.58	<.001
5	0.809	11412.99	11539.94	58.00	.044	59.35	<.001
6	0.774	11379.38	11334.37	53.08	.423	54.32	<.001

Table 5. Group Means on Indicators from the Latent Profile Analysis Five-Class Model

	Group 1 "Healthy" (*n*=44)	Group 4 "Intuitive Eating" (*n*=24)	Group 3 "Non-dieting" (*n*=230)	Group 2 "Dieting" (*n*=113)	Group 5 "Unhealthy" (*n*=49)
IES-Unconditional Permission to Eat	0.10	1.15	0.17	-0.56	-0.10
IES-Eating for Physical Rather than Emotional Reasons	1.22	1.84	-0.08	-0.19	-1.08
IES-Reliance on Hunger and Satiety Cues	2.70	2.18	0.04	-0.57	-2.26
IES-Body-Food Choice Congruence	1.54	-0.28	-0.23	0.48	-1.33
IES Average	1.39	1.22	-0.02	-0.21	-1.19
HEI-Adequacy	23.84	15.76	17.23	25.98	18.42
HEI-Moderation	35.24	23.58	25.23	39.24	26.86
HEI Total	59.08	39.34	42.46	65.21	45.28

Note. IES = Intuitive Eating Scale, HEI = Healthy Eating Index. Indicators on the Intuitive Eating Scale (IES-2) were based on the latent factor scores rather than the raw scale scores. The means on the latent factor scores were approximately zero.

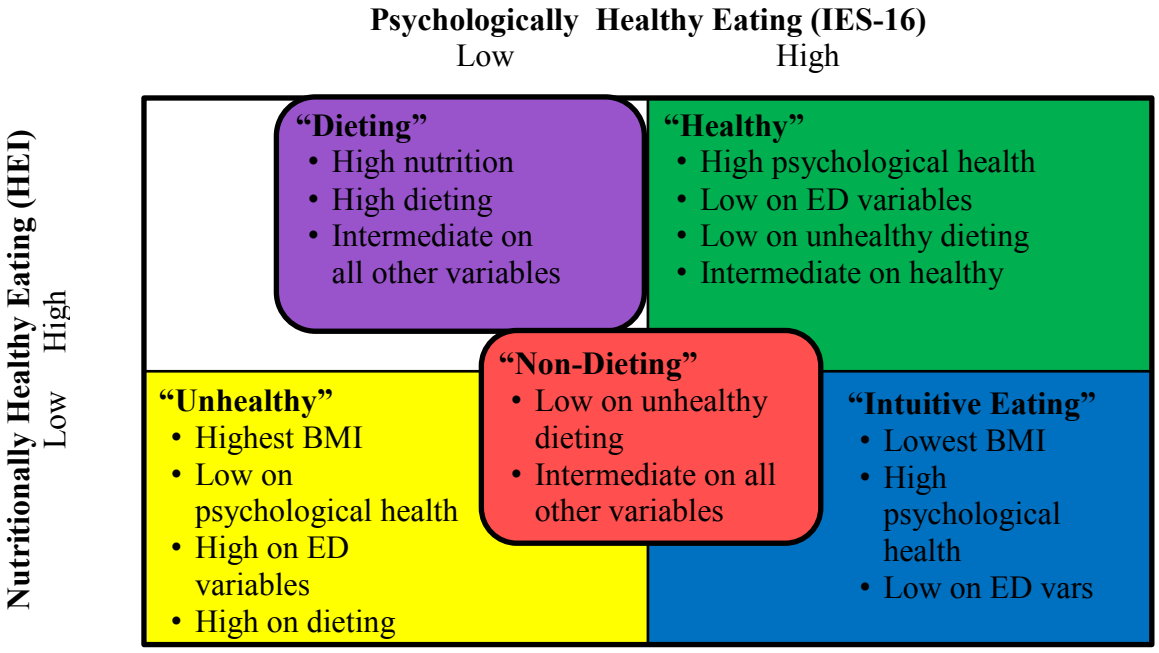
Table 6. One-Way ANOVAs Comparing the Five Classes from the Latent Profile Analysis on Study Variables

Scale	F	Means *Standard Deviations* Healthy	Dieting	Non-dieting	Intuitive Eating	Unhealthy
Healthy Eating Index Total Score	170.22	59.42[b,c,d,e] *10.28*	65.87[a,c,d,e] *8.82*	42.27[a,b,e] *7.96*	39.55[a,b,e] *8.01*	45.93[a,b,c,d] *9.00*
Intuitive Eating Scale – 16	179.11	68.05[b,c,e] *4.45*	53.67[a,c,d,e] *5.98*	55.97[a,b,d,e] *5.07*	68.88[b,c,e] *3.79*	42.67[a,b,c,d] *5.23*
Body Mass Index	14.38	23.06[d,e] *4.16*	23.28[d,e] *3.58*	23.64[d,e] *4.86*	21.36[a,c,d,e] *2.57*	28.56[a,b,c,d] *7.38*
Mental Health Inventory	9.54	168.48[b,c,e] *27.67*	154.18[a,e] *27.15*	155.22[a,e] *24.78*	161.96[e] *22.02*	136.90[a,b,c,d] *26.24*
Body Shape Questionnaire	20.92	69.59[b,c,e] *31.56*	99.06[a,c,d,e] *37.93*	83.53[a,b,d,e] *35.31*	58.17[b,c,e] *24.35*	121.80[a,b,c,d] *44.99*
DEBQ-Emotional Eating scale	23.86	20.57[b,c,d,e] *9.98*	27.67[a,d,e] *11.64*	26.66[a,d,e] *10.08*	15.00[a,b,c,e] *3.31*	37.39[a,b,c,d] *12.67*
Power of Food Scale	5.78	29.11[c,e] *12.91*	33.55[e] *12.80*	33.88[a,e] *11.69*	28.88[e] *15.60*	40.43[a,b,c,d] *14.86*
DWCBC - Healthy Dieting	12.65	2.89[b,d] *1.51*	3.47[a,c,d] *1.09*	2.58[b,d,e] *1.50*	1.63[a,b,c,e] *1.38*	3.04[c,d] *1.35*
DWCBC - Unhealthy	17.11	0.84[b,e] *1.18*	1.48[a,c,d] *1.84*	0.97[b,d,e] *1.41*	0.42[b,c,e] *0.88*	1.96[a,c,d] *1.93*
EDEQ Global Score	27.16	2.06[b,d,e] *1.04*	3.06[a,c,d,e] *1.32*	2.26[b,d,e] *1.16*	1.38[a,b,c,e] *0.45*	3.67[a,b,c,d] *1.39*

Note. DEBQ = Dutch Eating Behavior Questionnaire, DWCBC = Dieting and Weight Control Behavior Checklist. For one-way ANOVAs, all *p*s <.001 and *df*=4. Post hoc tests were conducted using independent samples t tests that do not assume homogeneity of variance.

[a]Differs significantly from Healthy group, [b]Differs significantly from Dieting group, [c]Differs significantly from Non-dieting group, [d]Differs significantly from Intuitive Eating group, [e]Differs significantly from Unhealthy group.

Figure 1. Summary of Group Differences across Five Classes Emerging from Latent Profile Analysis

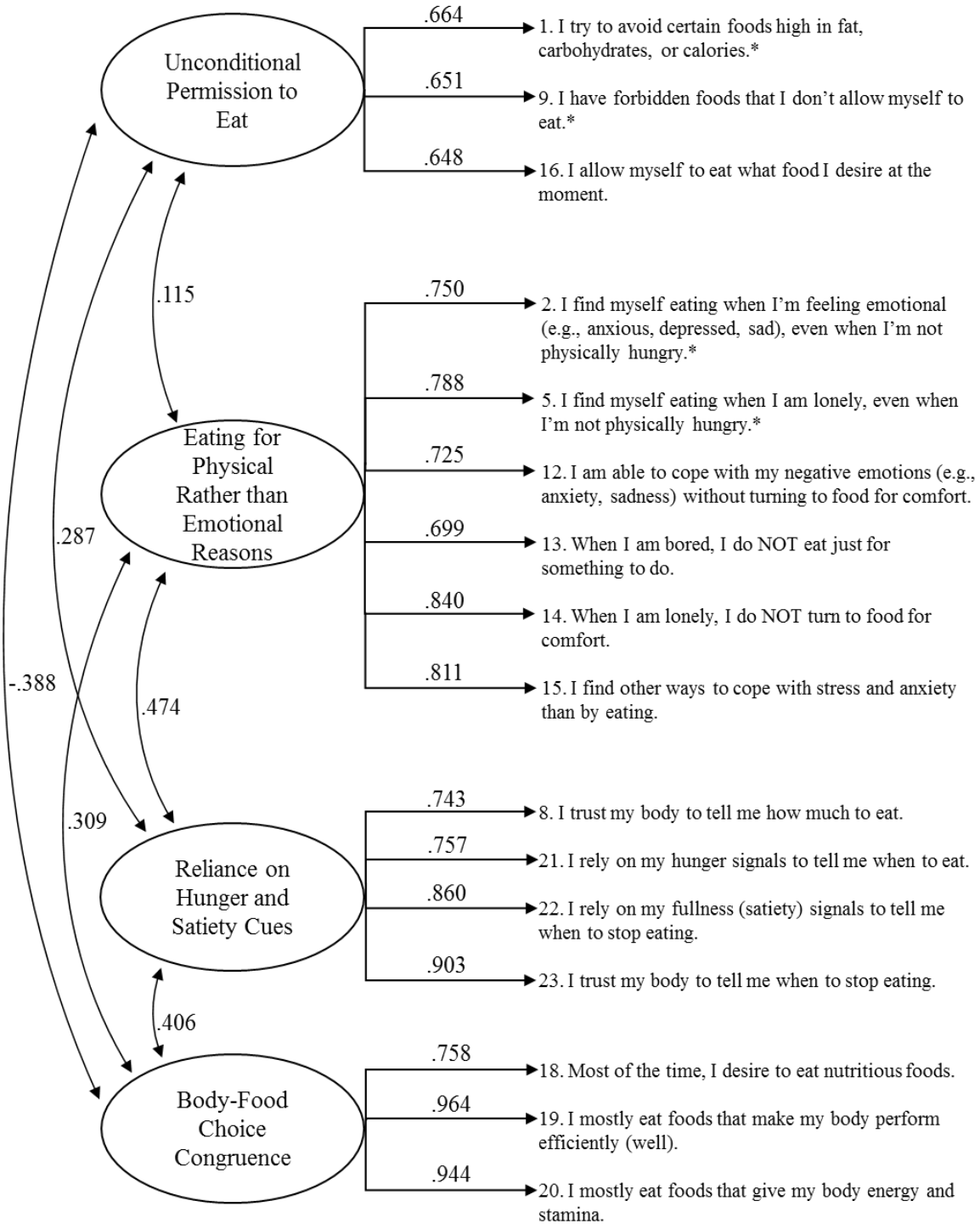


Note. HEI = Healthy Eating Inventory; IES-16 = Intuitive Eating Scale – 16. ED variables includes body dissatisfaction, disordered eating, hedonic hunger, and emotional eating.

Figure 2. Model of Psychologically and Nutritionally Healthy Eating

		Psychologically Healthy Eating (Intuitive Eating Scale)	
		Low	High
Nutritionally Healthy Eating (Healthy Eating Index)	Low	Group 1	Group 2
	High	Group 3	Group 4

Figure 3. Final Factor Structure of the Intuitive Eating Scale



Appendix A. Online Study Consent Form

The University of New Mexico Consent to Participate in Research
Eating in College Students 08/21/2013

Introduction

You are being asked to participate in a research study that is being done by Katherine Belon, who is the Principal Investigator and Jane Ellen Smith, from the Department of Psychology. This research is studying eating behaviors in undergraduate students. Although much research has been done on disordered eating and obesity, little research has looked at eating behaviors more generally. This study will investigate the types of food eaten by college undergraduates as well as other variables relevant to eating, such as when and how one eats and one's feelings about eating.

You are being asked to participate in this study because you are an undergraduate student over the age of 18. You must be fluent in English and have internet access to participate. Pregnant participants will not be allowed to participate in this study. A total of five hundred undergraduates will be invited to participate in this study.

This form will explain the research study, and will also explain the possible risks as well as the possible benefits to you. If you have any questions, please ask one of the study investigators. If you decide to provide your consent to participate in the study, please proceed and sign up for a study slot.

What will happen if I decide to participate?

If you agree to participate by signing up for a study slot, the following things will happen: You will be asked to complete a two part study. The first part consists of four dietary recalls. For these recalls, you will be prompted on four separate days to access an online website, where you will enter in the foods you ate in the past 24 hours. 3 of these recalls will be on weekdays and 1 will be on a weekend. For the second part of the study, which you will only be granted access to once you have completed the four recalls, you will be invited to participate in an online survey. It is expected that the online survey will take about 2 hours to complete.

How long will I be in this study?

Participation in this study will take a total of 4 hours in total. Your participation can occur over as little as 1 week or up to 3 weeks.

What are the risks or side effects of being in this study?

We have tried to reduce any possible risk to you as a result of taking part in this research. Although it is unlikely, some participants might experience stress, emotional distress, inconvenience and possible loss of privacy and confidentiality associated with participating in a research study.

Should you experience any concern about your eating, you will be provided with eating-related resources after you finish the online survey. You may contact Katherine Belon at kbelon@unm.edu if you wish to receive an additional copy of this list of resources. You may also call Jane Smith, Ph.D., the Chair of the Psychology Department, at 277-2650 or janellen@unm.edu. In the event that you continue to feel distressed, Dr. Smith will refer you to the appropriate agency where you may discuss your reactions with a trained professional.

For more information about risks and side effects, ask the investigator.

What are the benefits to being in this study?

It is possible that you will receive a direct benefit from the experience of completing the 24-hour recalls, such as increased awareness of food intake. No other direct benefits are expected to occur as a result of study participation. However, participation in this study may increase our knowledge of this area, potentially leading to a better understanding of eating behaviors.

What other choices do I have if I do not want to be in this study?

You do not have to participate in this study. It is completely voluntary, and you may discontinue the survey at any time.

How will my information be kept confidential?

We will take measures to protect the security of all your personal information, but we cannot guarantee confidentiality of all study data. Information contained in your study records is used by study staff and, in some cases it will be shared with the sponsor of the study. The University of New Mexico Institutional Review Board (IRB) that oversees human subject research and/or other entities may be permitted to access your records. There may be times when we are required by law to share your information. However, your name will not be used in any published reports about this study. Information contained in your study records is used by study staff. The University of New Mexico Institutional Review Board (IRB) that oversees human subject research and/or other entities may be permitted to access your records. There may be times when we are required by law to share your information. However, your name will not be used in any published reports about this study. All information collected from will be kept strictly confidential, and your personal responses will not be shared individually. Information collected as part of the study will be stored in a password-protected file on a secure computer server. Your responses to survey questions will not be linked to any identifying information about you, such as your name. Only the Principal Investigator (Katherine Belon) and her associates will have access to your study information.

What are the costs of taking part in this study?

There will be no financial cost to you for taking part in the study.

Will I be paid for taking part in this study?

Introductory psychology class students will receive four course credits for participating in this study and upper-level students will receive extra credit.

How will I know if you learn something new that may change my mind about participating?

You will be informed of any significant new findings that become available during the course of the study, such as changes in the risks or benefits resulting from participating in the research or new alternatives to participation that might change your mind about participating.

Can I stop being in the study once I begin?

Your participation in this study is completely voluntary. You have the right to choose not to participate or to withdraw your participation at any point in this study without affecting your future health care or other services to which you are entitled.

Whom can I call with questions or complaints about this study?

If you have any questions, concerns or complaints at any time about the research study, Katherine Belon, or her associates will be glad to answer them at 505-552-2372.
If you need to contact someone after business hours or on weekends, please call 505-552-2372 and ask for Katherine. If you would like to speak with someone other than the research team, you may call the UNM OFFICE OF THE IRB (OIRB) at (505) 277-2644.

Whom can I call with questions about my rights as a research participant?

If you have questions regarding your rights as a research participant, you may call the UNM OFFICE OF THE IRB (OIRB) at (505) 277-2644. The OFFICE OF THE IRB (OIRB) is a group of people from UNM and the community who provide independent oversight of safety and ethical issues related to research involving human participants. For more information, you may also access the IRB website at irb.unm.edu.

CONSENT

By signing up for the study, you are making a decision whether to participate in this study. Signing up for a study slot indicates that you read the information provided (or the information was read to you). By signing up for the study, you are not waiving any of your legal rights as a research participant.

I have had an opportunity to ask questions and all questions have been answered to my satisfaction. By signing up for this study, I agree to participate in this study.

Appendix B. Intuitive Eating Scale-2 + Psychologically Healthy Eating Items (Bolded)

	1 Strongly disagree	**2 Disagree**	**3 Neutral**	**4 Agree**	**5 Strongly Agree**
1. I try to avoid certain foods high in fat, carbohydrates, or calories.*	o	o	o	o	o
2. I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry.*	o	o	o	o	o
3. If I am craving a certain food, I allow myself to have it.	o	o	o	o	o
4. I get mad at myself for eating something unhealthy.*	o	o	o	o	o
5. I find myself eating when I am lonely, even when I'm not physically hungry.*	o	o	o	o	o
6. I trust my body to tell me when to eat.	o	o	o	o	o
7. I trust my body to tell me what to eat.	o	o	o	o	o
8. I trust my body to tell me how much to eat.	o	o	o	o	o
9. I have forbidden foods that I don't allow myself to eat.*	o	o	o	o	o
10. I use food to help me soothe my negative emotions.*	o	o	o	o	o
11. I find myself eating when I am stressed out, even when I'm not physically hungry.*	o	o	o	o	o
12. I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort.	o	o	o	o	o
13. When I am bored, I do NOT eat just for something to do.	o	o	o	o	o
14. When I am lonely, I do NOT turn to food for comfort.	o	o	o	o	o
15. I find other ways to cope with stress and anxiety than by eating.	o	o	o	o	o
16. I allow myself to eat what food I desire at the moment.	o	o	o	o	o
17. I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat.	o	o	o	o	o
18. Most of the time, I desire to eat nutritious foods.	o	o	o	o	o
19. I mostly eat foods that make my body perform efficiently (well).	o	o	o	o	o
20. I mostly eat foods that give my body energy and stamina.	o	o	o	o	o
21. I rely on my hunger signals to tell me when to eat.	o	o	o	o	o
22. I rely on my fullness (satiety) signals to tell me when to stop eating.	o	o	o	o	o

23. I trust my body to tell me when to stop eating.	o	o	o	o	o
24. Even when eating something I really enjoy, I can usually stop when I have had enough. (M)	o	o	o	o	o
25. I generally look forward to eating a good-tasting meal. (E)	o	o	o	o	o
26. At an all-you-can-eat buffet, I usually eat more food than is physically comfortable.* (M)	o	o	o	o	o
27. If the grocery store ran out of a low-fat item I was looking for, I would rather go without it than buy a version with a higher fat content.* (F)	o	o	o	o	o
28. I am someone who enjoys food. (E)	o	o	o	o	o
29. I portion out my food rather than eating from the container or serving dish so I won't stuff myself. (M)	o	o	o	o	o
30. I watch my portions to make sure that I am eating enough without overeating. (M)	o	o	o	o	o
31. I usually eat more than I intend to at social gatherings.* (M)	o	o	o	o	o
32. It's hard for me to enjoy food because I worry about gaining weight.* (E)	o	o	o	o	o
33. I don't feel comfortable eating foods when I don't know their ingredients or nutrition facts (calories, fat, carbohydrates).* (F)	o	o	o	o	o
34. I am comfortable eating a home-cooked meal that someone made for me, even if it might be unhealthy. (F)	o	o	o	o	o
35. I don't allow myself to eat unhealthy food, even if I really enjoy it.* (E)	o	o	o	o	o
36. If I forgot to bring my lunch or a snack to work/school, I would buy something to eat if I got hungry, even if it wasn't as healthy as my normal food. (F)	o	o	o	o	o
37. If a restaurant serves large portion sizes, I split meals with others or take home leftovers so that I don't overeat. (M)	o	o	o	o	o
38. I get very upset if I am forced by circumstances to eat food that is outside of my usual choices.* (F)	o	o	o	o	o
39. I enjoy a variety of foods and don't limit myself to only "good" or "healthy" foods. (E)	o	o	o	o	o
40. My diet changes quite a bit, depending on food availability, my preference that day, and how hungry I feel. (F)	o	o	o	o	o

41. I enjoy most of the food I eat each day. (E)	o	o	o	o	o
42. Sometimes I eat food that I don't especially enjoy just because I know it is good for me. (E)	o	o	o	o	o
43. Sometimes I eat food that I don't especially enjoy because it is all that is available at the time. (F)	o	o	o	o	o
44. Although I may prefer to eat something else, I am able to enjoy a variety of food at social functions. (F)	o	o	o	o	o
45. I tend to eat the same foods over and over.* F	o	o	o	o	o
46. I look forward to eating because I find it enjoyable. (E)	o	o	o	o	o
47. Compared to other daily activities, eating is enjoyable/pleasurable for me. (E)	o	o	o	o	o

Note. *Item is reverse-scored. (M)=Moderation scale, (E)=Enjoyment Scale, (F)=Flexibility scale

Appendix C. Body Shape Questionnaire

BSQ-34

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

OVER THE PAST <u>FOUR WEEKS:</u>

	Never	Rarely	Sometimes	Often	Very often	Always
1. Has feeling bored made you brood about your shape?	1	2	3	4	5	6
2. Have you been so worried about your shape that you have been feeling you ought to diet?	1	2	3	4	5	6
3. Have you thought that your thighs, hips or bottom are too large for the rest of you?	1	2	3	4	5	6
4. Have you been afraid that you might become fat (or fatter)?	1	2	3	4	5	6
5. Have you worried about your flesh being not firm enough?	1	2	3	4	5	6
6. Has feeling full (e.g. after eating a large meal) made you feel fat?	1	2	3	4	5	6
7. Have you felt so bad about your shape that you have cried?	1	2	3	4	5	6
8. Have you avoided running because your flesh might wobble?	1	2	3	4	5	6
9. Has being with thin women made you feel self-conscious about your shape?	1	2	3	4	5	6
10. Have you worried about your thighs spreading out when sitting down?	1	2	3	4	5	6
11. Has eating even a small amount of food made you feel fat?	1	2	3	4	5	6
12. Have you noticed the shape of other women and felt that your own shape compared unfavourably?	1	2	3	4	5	6
13. Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening to conversations)?	1	2	3	4	5	6
14. Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6

15. Have you avoided wearing clothes which make you particularly aware of the shape of your body?	1	2	3	4	5	6
16. Have you imagined cutting off fleshy areas of your body?	1	2	3	4	5	6
17. Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
18. Have you not gone out to social occasions (e.g. parties) because you have felt bad about your shape?	1	2	3	4	5	6
19. Have you felt excessively large and rounded?	1	2	3	4	5	6
20. Have you felt ashamed of your body?	1	2	3	4	5	6
21. Has worry about your shape made you diet?	1	2	3	4	5	6
22. Have you felt happiest about your shape when your stomach has been empty (e.g. in the morning)?	1	2	3	4	5	6
23. Have you thought that you are in the shape you are because you lack self-control?	1	2	3	4	5	6
24. Have you worried about other people seeing rolls of fat around your waist or stomach?	1	2	3	4	5	6
25. Have you felt that it is not fair that other women are thinner than you?	1	2	3	4	5	6
26. Have you vomited in order to feel thinner?	1	2	3	4	5	6
27. When in company have your worried about taking up too much room (e.g. sitting on a sofa, or a bus seat)?	1	2	3	4	5	6
28. Have you worried about your flesh being dimply?	1	2	3	4	5	6
29. Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?	1	2	3	4	5	6
30. Have you pinched areas of your body to see how much fat there is?	1	2	3	4	5	6
31. Have you avoided situations where people could see your body (e.g. communal changing rooms or swimming baths)?	1	2	3	4	5	6
32. Have you taken laxatives in order to feel thinner?	1	2	3	4	5	6
33. Have you been particularly self-conscious about your shape when in the company of other people?	1	2	3	4	5	6
34. Has worry about your shape made you feel you ought to exercise?	1	2	3	4	5	6

Appendix D. Dutch Eating Behavior Questionnaire – Emotional Eating Subscale

		Never	Seldom	Some-times	Often	Very often
1.	Do you have a desire to eat when you are irritated?	1	2	3	4	5
2.	Do you have a desire to eat when you are depressed or discouraged?	1	2	3	4	5
3.	Do you have a desire to eat when you are cross?	1	2	3	4	5
4.	Do you have a desire to eat when you are approaching something unpleasant to happen?	1	2	3	4	5
5.	Do you get the desire to eat when you are anxious, worried or tense?	1	2	3	4	5
6.	Do you have a desire to eat when things are going against you or when things have gone wrong?	1	2	3	4	5
7.	Do you have a desire to eat when you are frightened?	1	2	3	4	5
8.	Do you have a desire to eat when you are disappointed?	1	2	3	4	5
9.	Do you have a desire to eat when you are emotionally upset?	1	2	3	4	5
10.	Do you have a desire to eat when you have nothing to do?	1	2	3	4	5
11.	Do you have a desire to eat when you are feeling lonely?	1	2	3	4	5
12.	Do you have a desire to eat when somebody lets you down?	1	2	3	4	5
13.	Do you have a desire to eat when you are bored or restless?	1	2	3	4	5

Appendix E. Eating Disorders Examination-Questionnaire

Instructions: The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all the questions. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

On how many of the past 28 days….	**No days**	**1-5 days**	**6-12 days**	**13-15 days**	**16-22 days**	**23-27 days**	**Every day**
1 Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
2 Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
3 Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4 Have you had a definite desire to have an empty stomach with the aim or influencing your shape or weight?	0	1	2	3	4	5	6
5 Have you had a definite desire to have a totally flat stomach?	0	1	2	3	4	5	6
6 Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
7 Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8 Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
9 Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
10 Have you felt fat?	0	1	2	3	4	5	6
11 Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

12 Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days) .....

13 Over the past 28 days, how many <u>times</u> have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?	.....
14 ...On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?	.....
15 Over the past 28 days, on how many **<u>DAYS</u>** have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food and have had a sense of loss of control at the time)?	.....
16 Over the past 28 days, how many <u>times</u> have you made yourself sick (vomit) as a means of controlling your shape or weight?	.....
17 Over the past 28 days, how many <u>times</u> have you taken laxatives as a means of controlling your shape or weight?	.....
18 Over the past 28 days, how many <u>times</u> have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	.....

Questions 19 to 21: Please circle the appropriate number. <u>Please note that for these questions the term "binge eating" means</u> eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19 Over the past 28 days, on how many days have you eaten in secret (i.e., furtively)? …. Do not count episodes of binge eating	No days 0	1-5 days 1	6-12 days 2	13-15 days 3	16-22 days 4	23-27 days 5	Every day 6
20 On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? …. Do not count episodes of binge eating	None of the times 0	A few of the times 1	Less than half 2	Half of the times 3	More than half 4	Most of the time 5	Every time 6
21 Over the past 28 days, how concerned have you been about other people seeing you eat? …. Do not count episodes of binge eating	Not at all 0	1	Slightly 2	3	Moderately 4	5	Markedly 6

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past 28 days….	**Not at all**		**Slightly**		**Moderately**		**Markedly**
22. Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23. Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24. How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25. How dissatisfied have you been with your shape?	0	1	2	3	4	5	6
26. How dissatisfied have you been with your shape?	0	1	2	3	4	5	6
27. How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28. How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

What is your weight at present? (Please give your best estimate.)……

What is your height? (Please give your best estimate.) ……

If female: Over the past three-to-four months have you missed any menstrual periods? ……

If so, how many? ……

Have you been taking the "pill"? ……

THANK YOU

Appendix F. Power of Food Scale

	I don't agree	I agree a little	I agree some what	I agree quite a bit	I strongly agree
1. I find myself thinking about food even when I'm not physically hungry	(1)	(2)	(3)	(4)	(5)
2. I get more pleasure from eating than I do from almost anything else	(1)	(2)	(3)	(4)	(5)
3. If I see or smell a food I like, I get a powerful urge to have some	(1)	(2)	(3)	(4)	(5)
4. When I'm around a fattening food I love, it's hard to stop myself from at least tasting it	(1)	(2)	(3)	(4)	(5)
5. It's scary to think of the power that food has over me	(1)	(2)	(3)	(4)	(5)
6. When I know a delicious food is available, I can't help myself from thinking about having some	(1)	(2)	(3)	(4)	(5)
7. I love the taste of certain foods so much that I can't avoid eating them even if they're bad for me	(1)	(2)	(3)	(4)	(5)
8. Just before I taste a favorite food, I feel intense anticipation	(1)	(2)	(3)	(4)	(5)
9. When I eat delicious food I focus a lot on how good it tastes	(1)	(2)	(3)	(4)	(5)
10. Sometimes, when I'm doing everyday activities, I get an urge to eat 'out of the blue' (for no apparent reason)	(1)	(2)	(3)	(4)	(5)
11. I think I enjoy eating a lot more than most other people	(1)	(2)	(3)	(4)	(5)
12. Hearing someone describe a great meal makes me really want to have something to eat	(1)	(2)	(3)	(4)	(5)
13. It seems like I have food on my mind a lot	(1)	(2)	(3)	(4)	(5)
14. It's very important to me that the foods I eat are as delicious as possible	(1)	(2)	(3)	(4)	(5)
15. Before I eat a favorite food my mouth tends to flood with saliva	(1)	(2)	(3)	(4)	(5)

Appendix G. Dieting and Weight Control Behavior Checklist

1) How often have you gone on a diet during the last year? By 'diet' we mean changing the way you eat so you can lose weight.

a) Never b) 1-4 times
c) 5-10 times d) More than 10 times
e) I am always dieting

2) Have you done any of the following things in order to lose weight or keep from gaining weight during the past year?

	Yes	No
1) Exercised		
2) Ate more fruits and vegetables		
3) Ate less high-fat foods		
4) Ate fewer sweets		
5) Fasted		
6) Ate very little food		
7) Used a food substitute (powder or a special drink)		
8) Skipped meals		
9) Smoked more cigarettes		
10) Took diet pills		
11) Made myself vomit		
12) Used laxatives		
13) Used diuretics		

Appendix H. Scale of Ethnic Experience

Every individual belongs to at least one ethnic group. Some commonly used names of ethnic groups are Latino, Caucasian, Asian, etc. while more specific examples are African-American, Chinese-American, Italian-American, Native-American, and Mexican-American or Chinese, Italian, Mexican, etc. The following items ask you to identify how you feel about your specific ethnic group(s).

Background Information

Age:_____ Sex: M F

1. Please fill in the name of your specific ethnic group(s). _____

2. Do you belong to more than one ethnic group? Yes No

   If yes, how do you identify yourself?_____

3. What is your country of birth?_____

   If you were not born in the United States, how many years have you lived in the country? _____

4. In what country were the following members of your family born?

   Mother's country of birth:_____

   Father's country of birth:_____

   Mother's mother's country of birth:_____
   (maternal grandmother)
   Father's mother's country of birth _____
   (paternal grandmother)
   Mother's father's country of birth:_____
   (maternal grandfather)
   Father's father's country of birth: _____
   (paternal grandfather)

5. Choose the generation that applies to you (circle only one):

1st generation - you were born in another country.

2nd generation - you were born in the US; either parent born in another country.

3rd generation - you were born in the US; both parents born in the US; all grandparents born in another country.

4th generation - you and your parents were born in the US; and at least one grandparent born in another country with remainder born in the US.

5th generation - you and your parents were born in the US and all grandparents born in the US.

6. Choose the highest level of education that your parents completed:

	Father	Mother
Below grade 8		
Grade 8 completed		
Some high school beyond grade 8		
High school graduate		
Some College		
College degree (B.A., B.S.)		
Some graduate school		
Advanced degree (M.A., M.S., M.D., Ph.D)		

7. Your father's current occupation:_____
Your mother's current occupation:_____
(Past occupation, if retired or deceased)

8. Approximate annual family income (circle only one):

a. Under $10,000
b. $10,000 to $20,000
c. $20,000 to $30,000
d. $30,000 to $40,000
e. $40,000 to $50,000
f. Over $50,000

9. What is the first language you spoke?_____

10. Are you bilingual? Yes No

11. Are you the oldest child? Yes No

12. Are you the only child? Yes No

Directions: Read each item and indicate how much you agree or disagree with the statements.

SA=Strongly Agree, A=Agree, N=Neither, D=Disagree SD=Strongly Disagree	SA	A	N	D	SD
1. Holidays related to my ethnicity are not very important to me.					
2. Generally speaking, my ethnic group is respected in America.					
3. My ethnic group has been treated well in American society.					
4. Ethnicity was not important to my parents.					
5. At a social gathering, I would feel most comfortable if the majority of the people there were members of my own ethnic group.					
6. I feel like I belong to mainstream American culture.					
7. My ethnic background plays a very small role in how I live my life.					
8. I do not feel it is necessary to learn about the history of my ethnic group.					
9. I'm what most people think of as a typical American.					
10. I feel most comfortable talking about personal things with people from my own ethnic group.					
11. I do not feel a part of mainstream American culture.					
12. Ethnic pride is not very important to a child's upbringing.					
13. My ethnic group does not have the same opportunities as other ethnic groups.					
14. I have a strong sense of myself as a member of my ethnic group.					
15. I think that friendships work best when people are from the same ethnic group.					
16. I believe that my sense of ethnicity was strongly influenced by my parents.					
17. I think of myself as a typical American.					
18. I find it easiest to trust people from my own ethnic group.					
19. I often have to defend my ethnic group from criticism by people outside of my ethnic group.					
20. Being a member of my ethnic group is an important part of who I am.					
21. Discrimination against my ethnic group is not a problem in America.					
22. I prefer my close friends to be from my own ethnic group.					
23. My parents gave me a strong sense of cultural values.					
24. My ethnic group is often criticized in this country.					
25. I believe that it is important to take part in holidays that celebrate my ethnic group.					
26. In America, the opinions of people from my ethnic group are treated as less important than those of other ethnic groups.					
27. When I was growing up, ethnicity played a very little part in our family life.					
28. I understand how to get along well in mainstream America.					
29. In my life, I have experienced prejudice because of my ethnic group.					
30. I have taken time to learn about the history of my ethnic group.					
31. I have not felt prejudiced against in American society because of my ethnic background.					
32. The term "American" does not fit me.					

Appendix I. Demographics

1.What is your gender?
____(1) Female
____(2) Male
____(3) Transgender

2. How old are you? _____ years

3. Please enter your weight to the nearest pound.

4. Please select your height to the nearest inch.

5. Are you Hispanic, Latino, or Spanish origin?
____(1) No, not of Hispanic, Latino, or Spanish origin
____(2) Yes, Mexican, Mexican American, Chicano
____(3) Yes, Puerto Rican
____(4) Yes, Cuban
____(5) Yes, another Hispanic, Latino, or Spanish origin
____(6) Unavailable/Unknown

6. Which category best describes your race?
____(1) American Indian/Alaska Native
____(2) Asian
____(3) Black or African American
____(4) Native Hawaiian/Other Pacific Islander
____(5) White
____(6) Some other race
____(7) Unavailable/Unknown

7. Do you consider yourself to be
____(1) Heterosexual or straight
____(2) Gay or lesbian
____(3) Bisexual

8. Marital Status (check one):
____(1) Single, never been married
____(2) Legally married
____(3) Cohabitating with partner (but not married)
____(4) Separated but still married
____(5) Divorced
____(6) Widowed

9. Are you fluent in English?
_____(1) Yes
_____(2) No

10. Which best describes your living situation?
_____(1) Live at home with parents
_____(2) Live with roommates
_____(3) Live alone

11. Do you have children?
_____(1) Yes
_____(2) No

11a. If Yes to #11, how many children do you have?
_____

12. Do you have a food allergy?
_____(1) Yes
_____(2) No

12a. If Yes to #12, what type of food allergy do you have?
_____

13. Are you currently on a special diet of any kind? (include detox diets, Atkins/low-carb diets, etc)
_____(1) Yes
_____(2) No

14. Do you have any other medical conditions that impact your eating (for example, a condition such as diabetes that limits what you can eat)? If so, please list it/them here.
_____

15. Are you currently pregnant?
_____(1) Yes
_____(2) No

Appendix J. Mental Health Inventory

INSTRUCTIONS: Please read each question and tick the box by the ONE statement that best describes how things have been FOR YOU during the past month. There are no right or wrong answers.

1. How happy, satisfied, or pleased have you been with your personal life during the past month? (Tick one)
a) Extremely happy, could not have been more satisfied or pleased
b) Very happy most of the time
c) Generally, satisfied, pleased
d) Sometimes fairly satisfied, sometimes fairly unhappy
e) Generally dissatisfied, unhappy
f) Very dissatisfied, unhappy most of the time

2. How much of the time have you felt lonely during the past month? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

3. How often did you become nervous or jumpy when faced with excitement or unexpected situations during the past month? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

4. During the past month, how much of the time have you felt that the future looks hopeful and promising? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

5. How much of the time, during the past month, has your daily life been full of things that were interesting to you? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

6. How much of the time, during the past month, did you feel relaxed and free from tension? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

7. During the past month, how much of the time have you generally enjoyed the things you do? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

8. During the past month, have you had any reason to wonder if you were losing your mind, or losing control over the way you act, talk, think, feel, or of your memory? (Tick one)
a) No, not at all
b) Maybe a little
c) Yes, but not enough to be concerned or worried about
d) Yes, and I have been a little concerned
e) Yes, and I am quite concerned
f) Yes, I am very much concerned about it

9. Did you feel depressed during the past month? (Tick one)
a) Yes, to the point that I did not care about anything for days at a time
b) Yes, very depressed almost every day
c) Yes, quite depressed several times
d) Yes, a little depressed now and then
e) No, never felt depressed at all

10. During the past month, how much of the time have you felt loved and wanted? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

11. How much of the time, during the past month, have you been a very nervous person? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

12. When you have got up in the morning, this past month, about how often did you expect to have an interesting day? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

13. During the past month, how much of the time have you felt tense or "high-strung"? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

14. During the past month, have you been in firm control of your behaviour, thoughts, emotions or feelings? (Tick one)
a) Yes, very definitely
b) No, not too well
c) Yes, for the most part
d) No, and I am somewhat disturbed
e) Yes, I guess so
f) No, and I am very disturbed

15. During the past month, how often did your hands shake when you tried to do something? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

16. During the past month, how often did you feel that you had nothing to look forward to? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

17. How much of the time, during the past month, have you felt calm and peaceful? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

18. How much of the time, during the past month, have you felt emotionally stable? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

19. How much of the time, during the past month, have you felt downhearted and blue? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

20. How often have you felt like crying, during the past month? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

21. During the past month, how often have you felt that others would be better off if you were dead? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

22. How much of the time, during the past month, were you able to relax without difficulty? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

23. How much of the time, during the past month, did you feel that your love relationships, loving and being loved, were full and complete? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

24. How often, during the past month, did you feel that nothing turned out for you the way you wanted it to? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

25. How much have you been bothered by nervousness, or your "nerves", during the past month? (Tick one)
a) Extremely so, to the point
b) Bothered some, enough to notice where I could not take care of things
c) Very much bothered
d) Bothered just a little by nerves
e) Bothered quite a bit by nerves
f) Not bothered at all by this

26. During the past month, how much of the time has living been a wonderful adventure for you? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

27. How often, during the past month, have you felt so down in the dumps that nothing could cheer you up? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

28. During the past month, did you think about taking your own life? (Tick one)
a) Yes, very often
b) Yes, fairly often
c) Yes, a couple of times
d) Yes, at one time
e) No, never

29. During the past month, how much of the time have you felt restless, fidgety, or impatient? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

30. During the past month, how much of the time have you been moody or brooded about things? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

31. How much of the time, during the past month, have you felt cheerful, lighthearted? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

32. During the past month, how often did you get rattled, upset or flustered? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

33. During the past month, have you been anxious or worried? (Tick one)
a) Yes, extremely to the point of being sick or almost sick
b) Yes, very much so
c) Yes, quite a bit
d) Yes, some, enough to bother me
e) Yes, a little bit
f) No, not at all

34. During the past month, how much of the time were you a happy person? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

35. How often during the past month did you find yourself trying to calm down? (Tick one)
a) Always
b) Sometimes
c) Very often
d) Almost never
e) Fairly often
f) Never

36. During the past month, how much of the time have you been in low or very low spirits? (Tick one)
a) All of the time
b) Some of the time
c) Most of the time
d) A little of the time
e) A good bit of the time
f) None of the time

37. How often, during the past month, have you been waking up feeling fresh and rested? (Tick one)
a) Always, every day
b) Some days, but usually not
c) Almost every day
d) Hardly ever
e) Most days
f) Never wake up feeling rested

38. During the past month, have you been under or felt you were under any strain, stress or pressure? (Tick one)
a) Yes, almost more than I could stand or bear
b) Yes, quite a bit of pressure
c) Yes, some more than usual
d) Yes, some, but about normal
e) Yes, a little bit
f) No, not at all