INTUITIVE EATING SCALE: AN EXAMINATION AMONG ADOLESCENTS

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Intuitive eating assesses the degree to which individuals eat based on physiological cues rather than emotional or situational cues. The Intuitive Eating Scale was initially developed using college women. This study extends the work of Tylka and reports on the psychometric evaluation of the Intuitive Eating Scale (IES) in a sample of 515 middle school boys and girls. Exploratory factor analysis uncovered 4 factors: unconditional permission to eat, eating for physical rather than emotional reasons, trust in internal hunger/satiety cues and awareness of internal hunger/satiety cues; confirmatory factor analysis suggested that this 4-factor model adequately fit the data after 4 items with low factor loadings were deleted. Supporting its construct validity, IES scores were negatively related to body mass index, body dissatisfaction, negative affect, pressure for thinness, and internalization of the thin ideal, and were positively related to satisfaction with life, and experiencing greater positive affect.
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CHAPTER 1
INTRODUCTION

Current perspectives on eating behaviors have emphasized pathology, and research has focused on exploring the prevalence, causes, and factors associated with the emergence of disordered eating rather than on determining what contributes to the development of healthy, adaptive eating (e.g., Burrows & Cooper, 2002; Kostanski & Gullone, 1999; Striegel-Moore & Bulik, 2007; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011; Wilksch & Wade, 2010). When healthy eating is discussed, it generally has been defined simply as the lack of eating disorder symptoms (e.g., Tylka & Subich, 1999), rather than as an adaptive, independent behavioral process. Using college women, Tylka (2006) examined these adaptive eating processes through the development of the Intuitive Eating Scale (IES), which was the first scale to provide clinicians and researchers with a way to adequately measure this concept. Subsequent research (e.g., Tylka & Wilcox, 2006) has examined intuitive eating in relation to eating disorder symptomatology, and psychological well-being, but these studies all have been done with female undergraduates, thus limiting the generalizability of the findings. Thus, the purpose of the present study was to extend Tylka’s (2006) initial study by examining the IES in middle school students. Early adolescence is a timeframe when boys and girls are subjected to many sociocultural and psychological messages and pressures that may influence negatively the maintenance of adaptive eating practices, so it is crucial to explore the concept of intuitive eating in this age group.

Adaptive eating involves a reliance on internal cues, such as physiological feelings of hunger and fullness, to determine when and how much to eat rather than basing the decision to eat on emotions or external cues, such as portion size or established meal times (i.e., eating lunch
at noon). Tribole and Resch (1995) labeled this approach to eating “intuitive” because it encompasses an understanding of and response to physiological cues as well as less preoccupation with food. More specifically, intuitive eating has been conceptualized to represent three separate, but interrelated, adaptive behaviors (Tribole & Resch, 1995; Tylka, 2006): 1) unconditional permission to eat (readiness to eat in response to physiological hunger cues and to eat whatever food may be desired at the time); 2) eating for physical rather than emotional reasons (using food to satisfy physiological drives rather than as a coping mechanism for emotional distress); and 3) relying on physiological cues of hunger and satiety (awareness of physiological hunger and satiety cues and reliance on these cues to manage eating).

Consistent with this conceptualization and to provide researchers with a tool to measure this more adaptive, and healthy, approach to eating, Tylka (2006) developed the Intuitive Eating Scale (IES). Prior to her development of the IES, there was no reliable nor valid way to determine individuals’ perceptions about how they approached eating, other than through an assessment of eating pathology and disturbances. In her study, Tylka used several large samples of female undergraduates, and conducted both exploratory and confirmatory factor analyses that supported the three previously mentioned dimensions of intuitive eating. She found that higher levels of overall intuitive eating, as well as higher scores on all three factors, were related to lower BMI, greater psychological well-being and self-esteem, more proactive coping skills, and lower levels of depression and eating pathology. Further, the women who espoused more adaptive approaches to eating also were more likely to reject the societal thin-ideal, be satisfied with their body size and shape, and perceive few pressures to be thin. Together, these findings suggest that adaptive, healthy eating coincides with myriad positive psychological outcomes, which is one reason to explore intuitive eating in children and adolescence.
Subsequent research (Tylka & Wilcox, 2006) with college women has shown that two of the intuitive eating factors (i.e., eating for physical rather than emotional reasons; reliance on physiological cues) were not related significantly to different measures of eating disorder symptoms (i.e., the Dieting and Bulimia/Food Preoccupation subscales of the Eating Attitudes Test), suggesting that these IE factors measure something other than just the absence of disordered eating behaviors and attitudes. Unconditional permission to eat, however, was related to various eating disorder measures, suggesting that women who feel free to eat what and when they want experience less eating pathology. The findings from these studies (Tylka, 2006; Tylka & Wilcox, 2006) suggest that the IES is a valid and reliable measure of intuitive eating that is defined by three specific behaviors, and that these behaviors do not simply represent the absence of eating pathology, but actually measure more adaptive ways of approaching food intake.

Although initial studies on the scale’s psychometric properties have been supportive, the scale is limited in that it has not been tested with men or among adolescents or children. Testing and validating this measure in children and adolescents is an important next step in this line of research because adaptive eating often goes awry during late childhood and early adolescence and it is during this time period that problematic eating behaviors, such as dieting and fasting, may begin (de Castro & Goldstein, 1995; Edmunds & Hill, 1999). So, determining if intuitive eating, as conceptualized by Tylka (2006) exists for adolescents will allow researchers to examine when, and how, adaptive eating processes may be thwarted.

There are multiple psychological and environmental factors that may have an influence on children’s and adolescents’ ability to develop and maintain healthy eating behaviors (Baughcum, Burklow, Deeks, Powers, & Whitaker, 1998; Kumanyika, 2008; Spruijt-Metz, 2011). Throughout childhood, parents (and other adults) have the most control over what and
when children eat, and what is even available to them. Satter (2005) suggested that parents should (a) share the responsibility of feeding with their children and trust in the child to use their internal physiological cues of hunger and satiety to determine their level of food intake in the context of regular meals and snacks, and (b) avoid coercive feeding strategies, such as restrictive or controlling feeding practices, and using food as a reward. The eventual goal is that the child attends to and learns to trust their internal cues through their life, thus learning to engage in intuitive eating (Eneli, Crum & Tylka, 2008).

However, not all children are raised in environments that provide them with this freedom in their eating, which can contribute to the development of unhealthy eating behaviors. For example, when parents’ control is too rigid or restrictive, there is an increased risk of overeating and eating in the absence of hunger (Birch & Fisher, 2007; Birch, Fisher, & Davidson, 2003; Carper, Fisher, & Birch, 2000; Francis & Birch, 2005; Jansen, Mulkens, & Jansen, 2007; van Strien & Bazelier, 2007; Webber, Hill, Saxton, Van Jaarsveld, & Wardle, 2009). In addition, children begin to decrease their reliance on their physiological hunger and satiety cues and start to respond to external cues, such as flavor and portion size (e.g., Fisher, Rolls, & Birch, 2003) and negative emotions, such as anxiety, depression, and anger (e.g., Allen, Byrne, La Puma, McLean, & Davis, 2008; Carper et al., 2000; Czaja, Rief, & Hilbert, 2009; Goosens, Braet, Van Vlierberghe, & Mels, 2009; Macht & Simons, 2000; Nguyen-Rodriguez, Unger, & Spruijt-Metz, 2009).

Once they reach adolescence and their bodies change physically, boys and girls begin to experience more body image concerns (Burrows & Cooper, 2002; Ricciardelli, McCabe, Holt, & Finemore, 2003), which may lead them to alter their diets even more, either to lose weight (e.g., restriction that occurs with many girls; de Castro & Goldstein, 1995) or gain weight (e.g., boys
who are trying to increase muscle mass; Edmunds & Hill, 1999). These dietary changes may be in opposition to their natural physiological cues and lead to adolescents becoming less aware of when they are hungry, less able to trust their internal cues, and more likely to eat for reasons other than being hungry.

Purpose

The purpose of the current study is to examine the psychometric properties of the IES, including its factor structure, in a sample of middle school boys and girls. Tylka and colleagues (Tylka, 2006; Tylka & Wilcox, 2006) recommended that future studies (a) examine the IES in other populations to determine if the 3-factor solution that emerged for college women fits in other populations, such as men and children, and (b) make modifications to IES items to ensure that they matched the developmental level of the population being studied.

In the first study, the factor structure of the IES was examined through exploratory procedures, which were appropriate for two reasons. First, items on the IES were modified to reflect the reading level and experiences of the children and adolescents. For example, the original item “I use food to help me soothe my negative emotions” was expanded to “I use food to help me soothe my negative emotions, such as feeling sad or angry.” Second, the IES had been developed and evaluated with young adults and, in this study, it was being tested in a different population and it was not clear whether the same factor structure would apply.

In the second study, I used a confirmatory factor analysis (CFA) to test the factor structure established in Study 1. Once the factor structure was confirmed, the factors’ internal consistency reliability was determined, and discriminant and concurrent validity coefficients obtained. Given previous research (Tylka, 2006), I hypothesized that higher scores on the IES and the confirmed factors will be (a) unrelated to age, gender, race/ethnicity, and grade in school,
(b) positively related to subjective well-being and body satisfaction, and (c) related negatively to the adolescents’ BMI, modeled behaviors regarding pathogenic eating in the family, negative affect (i.e., worried, angry, sad), internalization of the societal thin ideal, and sociocultural pressures regarding losing weight, have a thin body, and dieting.
CHAPTER 2

METHOD

Participants

Participants were 239 boys and 276 girls drawn from two different middle schools in a suburban school district. The data were randomly divided into two equal samples for Study 1 and Study 2. Using multivariate and univariate analyses of variance, the two samples were compared on all subsequent dependent variables and no significant differences were found (p’s > .05).

Sample 1 participants included 119 boys and 140 girls. Their mean age was 12.43 years (SD = 0.96; males: 12.50 [0.98] years; females: 12.37 [0.94] years). In terms of race/ethnicity, 68.1% (n = 177) were Caucasian, 16.9% (n = 44) Hispanic, 8.8% (n = 23) African American, 3.1% (n = 8) Asian American/Pacific Islander, and 0.4% (n = 1) American Indian. For year in school, 130 (50%) were in 6th grade, 60 (23.1%) in 7th, and 70 (26.9%) in 8th.

For the boys, the mean BMI was 20.49 kg/m² (SD = 3.69). Regarding whether or not they were taking any action to change their weight status, 23 (19.3%) reported they were trying to stay the same weight, 34 (28.6%) were trying to lose weight, 21 (17.6%) were trying to gain weight, and 41 (34.5%) were not doing anything about their weight. For the girls, the mean BMI was 21.14 kg/m² (SD = 4.63); 26 (18.7%) said they were trying to stay the same weight, 70 (50.4%) were trying to lose weight, 4 (2.9%) were trying to gain weight, and 28 (27.3%) were not doing anything about their weight.

In Sample 2, participants were 120 boys and 136 girls drawn from two different middle schools in a suburban school district. Their mean age was 12.41 years of age (SD = .95; males: 12.48 [1.01] years; girls: 12.35 [.89] years). In terms of race/ethnicity, 68.4% (n = 175) were Caucasian, 16.8% (n = 43) Hispanic, 8.6% (n = 22) African American, and 2.7% (n = 7) Asian
American/Pacific Islander. For year in school, 126 (49.2%) were in sixth grade, 64 (25.0%) in seventh, and 66 (25.8%) in eighth.

For the boys, the mean BMI was 21.17 kg/m² ($SD = 4.82$); 21 (17.5%) reported they were trying to stay the same weight, 41 (34.2%) were trying to lose weight, 21 (17.5%) were trying to gain weight, and 37 (30.8%) were not doing anything about their weight. For the girls, the mean BMI was 20.83 kg/m² ($SD = 4.34$); 26 (19.1%) said they were trying to stay the same weight, 68 (50.0%) were trying to lose weight, 4 (2.9%) were trying to gain weight, and 38 (27.9%) were not doing anything about their weight.

Measures

Demographics. A demographic questionnaire was developed for this study and included questions on age, grade, and race/ethnicity. In addition, participants were asked what they were trying to do currently about their weight.

Intuitive eating. The 21-item Intuitive Eating Scale (IES; Tylka, 2006) assesses the degree to which individuals eat based on physiological cues rather than emotional or situational cues and, as originally developed using a sample of female undergraduates, consists of three subscales: Unconditional Permission to Eat (9 items; readiness to eat in response to physiological hunger cues and to eat whatever food may be desired at the time, e.g., “If I am craving a certain food, I allow myself to have it”); Eating for Physical Rather than Emotional Reasons (6 items; eating based on emotions rather than physiological cues, e.g., “I find myself eating when I am bored, even when I’m not physically hungry”); and Reliance on Internal Hunger/Satiety Cues (6 items; awareness of physiological hunger and satiety cues and reliance on these cues to manage eating, e.g., “I can tell when I’m slightly full”). Because the IES initially was developed for adult women, six items were rephrased to make them more appropriate for children as suggested
by Tylka (2006). Three Ph.D. faculty members with expertise in the areas of eating disorders, children, and body image made initial changes to the items. These changes were then reviewed by a small group \((n = 4)\) of 6\(^{th}\) and 8\(^{th}\) grade boys and girls to obtain feedback on the items’ clarity and the adolescents’ level of understanding. The primary changes made to these six items were to add more details to increase comprehension for this age group, though one item had to be modified to reflect the fact that the children were likely not buying their own food. For example, the original item “I use food to help me soothe my negative emotions” was changed to “I use food to help me soothe my negative emotions, such as feeling sad or angry.” For each item, participants respond using a 5-point Likert scale that ranges from 1, \textit{strongly disagree}, to 5, \textit{strongly agree}. Each factor total score, as well as the overall total score, is the average of the respective items and can range from 1 to 5; higher scores represent higher levels on that dimension of intuitive eating. In a sample of undergraduate women, Tylka reported Cronbach’s alphas of .85 (total IES), .87 (Unconditional Permission), .85 (Physical Rather Than Emotional Reasons), and .72 (Internal Hunger/Satiety cues); 3-week test-retest reliabilities ranged from .74 to .90 in the same sample. Tylka found the IES total score to be negatively related to BMI \((r = -.28)\); internalization of the thin-ideal \((r = -.50)\) and body dissatisfaction \((r = -.56)\) and positively related to self-esteem \((r = .44)\), proactive coping \((r = .29)\) and satisfaction with life \((r = .41)\).

Body composition. The FITNESSGRAM® (Cooper Institute, 2007) was used to objectively assess body composition through body mass index (BMI), which is represented in kg/m\(^2\). During annual FITNESSGRAM testing at each middle school, height and weight were objectively measured by the physical education instructors at each school. Weight was measured using a Seca digital scale (Model 882) and recorded to the nearest 0.1 lb. Height and weight was transformed into BMI within the FITNESSGRAM® program. The FITNESSGRAM/ACTIVITY
manual (see Cooper Institute, 2007) provides extensive information about the BMI as reliable and a valid representation of body composition.

Dieting behaviors. A 4-item questionnaire, developed specifically for this study, assesses the impact of viewing individuals engage in dieting behaviors or controlling the food they eat. Specifically, on a 5-point scale ranging from 1, *none*, to 5, *a lot*, individuals rate the extent to which they have seen the following sources engage in dietary behaviors: family; friends who are boys; friends who are girls; and models/actors in the media (e.g., magazines, TV, movies). Responses to each item were considered independently as an indicator of dieting behaviors and can range from 1, *did not view any dieting behaviors*, to 5, *viewed a lot of dieting behaviors*.

Body image. The 7-item body factor from the Body Parts Satisfaction Scale-Revised (BPSS-R; Petrie, Tripp & Harvey, 2002) assesses the level of satisfaction with one’s body as represented through various body parts and features, such as weight, stomach and hips. Using a 6-point scale that ranges from 1, *extremely dissatisfied*, to 6, *extremely satisfied*, participants rate each item based on how satisfied they have been during the past three months. Total score is the mean and higher scores indicate more satisfaction. Petrie et al. (2002) reported a Cronbach’s alpha of .90 in a sample of undergraduate women, and Bradford and Petrie (2008) reported a 6-month test-retest reliability of .89 for female undergraduates. Cronbach’s alpha from the current study was .89. Petrie et al. (2002) found significant correlations between the BPSS-R and BMI ($r = -.32$) and the Body Shape Questionnaire ($r = -.75$), supporting its validity.

Negative affect. The Positive and Negative Affect Scale-Expanded Form (PANAS-X; Watson & Clark, 1994) assesses specific emotional states. For the purpose of this study, 8 individual items were included to represent the following emotions: happy, anxious/worried, angry, worthless, confident, sad/depressed, ashamed, and guilty. For each item, the participants
rate on average the extent to which they have experienced each emotion during the past three months on a 5-point scale ranging from 1, very slightly or not at all, to 5, extremely. Each item is considered independently.

Sociocultural internalization. The 9-item Sociocultural Attitudes Towards Appearance Scale-3 General Internalization Scale (SATAQ-3-GI; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) assesses the level of general internalization of media influences, such as TV, magazines, and movies. On items such as “I do not care if my body looks like the body of people who are on TV,” participants respond using a 5-point scale ranging from 1, definitely disagree, to 5, definitely agree. Total score is the mean; higher scores reflect greater levels of internalization. Thompson et al. (2004) reported a Cronbach’s alpha of .96 in a sample of undergraduate women; Cronbach’s alpha from the current study was .88. The SATAQ-3 was found to be significantly correlated with the Ideal Body Internalization Scale Revised ($r = .51$) and the Drive for Thinness ($r = .57$) and Body Dissatisfaction ($r = .49$) subscales on the Eating Disorders Inventory (Thompson et al., 2004).

Sociocultural pressures. A 12-item Perceived Sociocultural Pressures Scale that was adapted from the work of Stice and Bearman (2001) assesses the pressures that participants perceive in regards to losing weight, having a thin body, and dieting. On items, such as “I have felt pressure to lose weight,” participants indicate the extent to which they have experienced that type of pressure over the previous three months. Using a 5-point scale ranging from 1, none, to 5, a lot, individuals rate the pressure from family from friends who are boys, from friends who are girls, and from TV and magazines. Thus, a total score for each type of pressure (e.g., lose weight) is the mean of the sources; totals scores can range from 1, no pressure, to 5, high pressure. In a sample of high school students, Stice and Agras (1998) reported a Cronbach’s
alpha of .88 and a two-week test-retest reliability of .93. Cronbach’s alphas from the current study were .76 (lose weight), .80 (have a thin body), and .82 (diet). In a sample of female collegiate athletes, these three types of pressures were shown to be related significantly to the BPSS ($r$’s = -.51 - .55) and the SATAQ-I ($r$’s = .53 - .55) (Anderson, Petrie, & Neumann, in press).

Subjective well-being. The 5-item Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) assesses overall satisfaction with life. On items such as “In most ways, my life is close to my ideal,” participants respond based on how they have felt over the past three months using a 7-point Likert scale that ranges from 1, strongly disagree, to 7, strongly agree. Total scores can range from 5 to 35; higher scores indicate greater life satisfaction. Diener et al. (1985) found a Cronbach’s alpha of .87 and a two month test-retest correlation of .82 in a sample of male and female undergraduates. Cronbach’s alpha from the current study was .85. Schimmack, Oishi, Furr, and Funder (2004) reported that the SWLS was negatively correlated with a measure of depression ($r = -.55$ to -.57), providing support for the scale’s validity.

Procedure

Initially, approval from the University of North Texas Institutional Review Board was obtained to conduct the study. In the spring semester, as part of a state-mandated requirement that all students in Grades 3-12 participate in annual physical fitness testing, girls and boys from two middle schools located in a suburban Texas community were solicited to complete a series of questionnaires regarding their physical and psychological health. Following receipt of parental consent as well as assent from the participants, the boys and girls completed a battery of questionnaires, which included the Intuitive Eating Scale (IES; Tylka, 2006), the Sociocultural
Attitudes Toward Appearances Questionnaire-3 (SATAQ-3; Thompson, et al., 2004), Body Parts Satisfaction Scale-Revised (BPSS-R; Petrie et al., 2002), Satisfaction With Life Scale (SWLS; Diener et al., 1985), Perceived Sociocultural Pressures Scale (PSPS; Stice, 2001), Positive and Negative Affect Scale-Expanded Form (PANAS-X; Watson & Clark, 1994), and a demographics questionnaire, in groups of 20-40 during their required physical education classes. Upon completion of the questionnaires, the students were entered into a drawing to win one of several cash prizes.

Data Analysis

Exploratory factor analysis. In this study, an exploratory factor analysis (EFA) was used to examine the factor structure of the IES. Prior to beginning, Bartlett’s (1950) test of sphericity was examined to estimate the probability that correlations between items are 0 and determine if factorability is appropriate (Worthington & Whittaker, 2006), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to establish whether the correlation matrix actually contains factors rather than simply chance correlations between a subset of variables. KMO values of .60 or higher are adequate for ensuring good factor analysis (Tabachnick & Fidell, 2007).

Principle axis factoring, with squared multiple correlations was used to estimate the communalities, as the method of factor extraction. Based on the recommendations of Worthington and Whittaker (2006), parallel analysis was used to determine factor retention (Hayton, Allen, & Scarpello, 2004) and then considered conceptual interpretability of the factors as well. To account for the possibility that the factors of the IES may be correlated, a Promax rotation was used. Initial criteria for item retention or deletion included: (a) deleting items with factor loadings of less than .32; (b) deleting cross-loading items with a difference between
highest loading of less than .15; and (c) deleting items with absolute loadings higher than a
specified value (e.g., .32) on two or more factors (Tabachnick & Fidell, 2007). Once the factor
structure was defined, the internal consistency of each factor was determined using Cronbach’s
alpha. In addition, Pearson product-moment correlations between the IES factors and age, and
ANOVAs of IES factors and gender, and race/ethnicity were examined.

Confirmatory factor analysis. A confirmatory factor analysis (CFA) was used to examine
the factor solution that resulted from the EFA. Structural equation modeling (SEM) is currently
the preferred CFA approach in counseling psychology research (Worthington & Whittaker,
2006); the EQS Structural Equations Program was used (Bentler, 1995) for the SEM analyses.
The overall fit of the model was assessed using a combination of fit indices (Kline, 2005;
Worthington & Whittaker, 2006): the chi-square ($\chi^2$) goodness of fit statistic, the root mean
square error of approximation (RMSEA; Steiger & Lind, 1980) with a 90% confidence interval,
and the comparative fit index (CFI; Bentler, 1990). For the confirmed factors, the internal
consistency reliabilities were then calculated. In addition, Pearson product-moment correlations
between the IES factors and age, and ANOVAs of IES factors and gender, and race/ethnicity
were examined. Next, concurrent validity was evaluated by examining correlations between the
IES total and subscales and BMI, dieting behaviors, the Body Parts Satisfaction Scale-Revised
body factor (BPSS-R), the Perceived Sociocultural Pressures Scale (PSPS), the Sociocultural
Attitudes Towards Appearance Scale-3 (SATAQ-3), the items from the Positive and Negative
Affect Scale-Expanded Form (PANAS-X), and the Satisfaction with Life Scale (SWLS).
CHAPTER 3

RESULTS

Exploratory factor analysis

For the 17-item Intuitive Eating Scale (IES), Bartlett’s (1950) test of sphericity ($\chi^2 = 1534.35$, $df = 153$, $p < .001$) and the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = 0.80) both provided evidence that item bivariate correlations were adequate for factorability (Tabachnick & Fidell, 2007). Based on the factor extraction and retention procedures previously described, a four-factor model, which explained 57.97% of the variance, was determined: Unconditional Permission to Eat (5 items); Eating for Physical Rather than Emotional Reasons (6 items); Trust in Internal Hunger/Satiety Cues (3 items); and Awareness of Internal Hunger/Satiety Cues (3 items); all factor loadings exceeded .40 (see Table B.1). Internal consistencies (Cronbach’s alpha) for the four factors were .75 (Total IES), .78 (Unconditional Permission to Eat), .85 (Eating for Physical Rather than Emotional Reasons), .75 (Trust in Internal Hunger/Satiety Cues), and .60 (Awareness of Internal Hunger/Satiety Cues).

Four items – 2, 4, 9, and 21 – were dropped due to low factor loadings. Originally, Item 4 [“If I am craving a certain food, I allow myself to have it”], Item 2 [“I stop eating when I feel full (not overstuffed)] and Item 21 [“My parents don’t keep certain foods in the house/apartment because they think I may lose control and eat them”] loaded on Factors 1, 2 and 3, respectively (Tylka, 2006); in this study, these items did not load on any of the four factors. In the current study, Item 9 [“I get feel okay with myself when I eat something unhealthy”] loaded on Factor 2; however, this items was later dropped because of high residuals.

As expected, there was no correlation between age and any of the four factors: Unconditional Permission to Eat ($r = .06$), Eating for Physical rather than Emotional Reasons ($r$
= .02), Trust in Internal Hunger/Satiety Cues ($r = -.01$) and Awareness of Internal Hunger/Satiety Cues ($r = -.06$). There were, however, significant negative correlations between BMI and Unconditional Permission to Eat ($r = -.33$), Eating for Physical rather than Emotional Reasons ($r = -.20$), and Trust in Internal Hunger/Satiety Cues ($r = -.20$). There was no relationship between BMI and Awareness of Internal Hunger/Satiety Cues ($r = -.05$).

With respect to gender, there was no relationship with Unconditional Permission to Eat, $F(1, 259) = 2.98, p = .09$, partial $\eta^2 = .01$, Trust in Internal Hunger/Satiety Cues, $F(1, 259) = 2.51, p = .11$, partial $\eta^2 = .01$ and Awareness of Internal Hunger/Satiety Cues, $F(1, 259) = 2.58, p = .11$, partial $\eta^2 = .01$. However there was a significant gender effect for Eating for Physical rather than Emotional Reasons, $F(1, 259) = 14.67, p < .001$, partial $\eta^2 = .05$; the girls ($M = 3.69, SD = 1.06$) were more likely than the boys ($M = 4.16, SD = .85$) to use food to cope with emotions.

As expected, race/ethnicity (i.e., Caucasian vs. Minority) was unrelated to Unconditional Permission to Eat, $F(1, 253) = .3.32, p = .07$, partial $\eta^2 = .01$, Eating for Physical rather than Emotional Reasons, $F(1, 253) = .51, p = .48$, partial $\eta^2 = .00$, Trust in Internal Hunger/Satiety Cues, $F(1, 253) = 1.30, p = .26$, partial $\eta^2 = .01$, and Awareness of Internal Hunger/Satiety Cues, $F(1, 253) = .07, p = .80$, partial $\eta^2 = .00$.

Confirmatory factor analysis

The CFA supported the four-factor model: $\chi^2 (113) = 158.202, CFI = .96; RMSEA = .04 [90% CI= .02 to .05])$. The standardized factor loadings were high as well (see Table B.2). Internal consistencies (Cronbach’s alpha) for the four factors were .81 (Unconditional Permission to Eat), .83 (Eating for Physical Rather than Emotional Reasons), .79 (Trust in Internal Hunger/Satiety Cues), and .65 (Awareness of Internal Hunger/Satiety Cues).
Again, there was no correlation between age and total IES score, Eating for Physical rather than Emotional Reasons \( (r = .004) \), Trust in Internal Hunger/Satiety Cues \( (r = -.01) \) and Awareness of Internal Hunger/Satiety Cues \( (r = -.10) \). Contrary to expectations, there was a small, but significant, relationship between age and Unconditional Permission to Eat \( (r = .18) \), which suggests that the older boys and girls felt more free to eat what and when they wanted.

With respect to gender, there was no relationship with Unconditional Permission to Eat, \( F (1, 254) = 3.20, p = .08 \), partial \( \eta^2 = .01 \) and Trust in Internal Hunger/Satiety Cues, \( F(1, 254) = .003, p = .95 \), partial \( \eta^2 = .00 \). However there was a significant gender effect for total IES score, \( F(1, 254) = 4.08, p = .05 \), partial \( \eta^2 = .02 \), suggesting that boys \( (M = 3.71, SD = .54) \) were slightly better at intuitive eating than were girls \( (M = 3.57, SD = .54) \). In addition, there was a significant effect for Eating for Physical rather than Emotional Reasons, \( F(1, 254) = 10.03, p < .005 \), partial \( \eta^2 = .04 \); again, the girls \( (M = 3.68, SD = 1.04) \) were more likely than the boys \( (M = 4.06, SD = .86) \) to use food to cope with emotions. There also was a significant effect for Awareness of Internal Hunger/Satiety Cues, \( F(1, 254) = 5.68, p < .05 \), partial \( \eta^2 = .02 \); the girls \( (M = 3.98, SD = .82) \) reported having more bodily awareness with respect to being hungry or full than did the boys \( (M = 3.73, SD = .88) \).

Again, race/ethnicity (i.e., Caucasian vs. Minority) was unrelated to the total IES score, \( F(1, 245) = 2.05, p = .15 \), partial \( \eta^2 = .01 \), Unconditional Permission to Eat, \( F(1, 245) = .54, p = .47 \), partial \( \eta^2 = .00 \), Eating for Physical rather than Emotional Reasons, \( F(1, 245) = .20, p = .15 \), partial \( \eta^2 = .00 \) and Awareness of Internal Hunger/Satiety Cues, \( F(1, 245) = 1.69, p = .20 \), partial \( \eta^2 = .01 \). Race/ethnicity, however, was related to Trust in Internal Hunger/Satiety Cues, \( F (1, 245) = 8.04, p < .01 \), partial \( \eta^2 = .03 \); Caucasian adolescents \( (M = 3.53, SD = .98) \) reported
having higher levels of trust in their internal cues about being hungry or full than did the minority adolescents ($M = 3.15$, $SD = .93$).

**Concurrent Validity**

**Unconditional Permission to Eat.** This factor was correlated significantly with BMI ($r = -.30$) and body satisfaction ($r = .27$), but not satisfaction with life ($r = .09$). These findings suggest that the boys and girls who do not restrict their eating choices tend to have a leaner body composition and report being more satisfied with the size and shape of their bodies (but not with their lives in general).

Unconditional Permission to Eat was correlated significantly with observing family members’ (but not anyone else’s) dieting behaviors ($r = -.22$), internalization of societal ideals regarding attractiveness, body, and appearance ($r = -.29$), and pressures to lose weight ($r = -.41$), have a thin body ($r = -.39$), and diet ($r = -.40$). These results suggest that adolescents who feel a freedom to eat whatever they choose are less likely to have been influenced by societal and familial messages, pressures, and behaviors that promote dieting behaviors and the need to have a thin body.

This factor was correlated significantly with anxiety ($r = -.15$), feeling worthless ($r = -.25$), sadness/depression ($r = -.21$), shame ($r = -.19$), guilt ($r = -.19$), and confidence ($r = .13$), but not anger ($r = -.06$). These findings suggest that those adolescents who give themselves unconditional permission to eat are less likely to experience a wide range of negative emotions, and more likely to report being confident. See Table B.3 for the correlations.

**Eating for Physical Rather than Emotional Reasons.** Eating for Physical rather than Emotional Reasons was significantly related to BMI ($r = .15$), body satisfaction ($r = .33$), and
satisfaction with life ($r = .23$), suggesting that young adolescents who eat when they are physically hungry are more likely to be satisfied with their bodies and with life in general.

This factor was related significantly to internalization ($r = .29$), and the experience of societal pressures to lose weight ($r = -.24$), have a thin body ($r = -.28$), and diet ($r = -.26$). However, there was no significant association with being exposed to family members’, friends’, or models’/actors’ dieting behaviors. These findings suggest that those adolescents who eat primarily to cope with negative emotions are more likely to endorse societal ideals regarding attractiveness and appearance and to report experiencing more pressures about weight loss, having a thin body, and dieting.

As expected, this factor was related positively to happiness ($r = .18$) and confidence ($r = .25$), and negatively with sadness ($r = -.40$), anxiousness ($r = -.24$), anger ($r = -.16$), worthlessness ($r = -.24$), shame ($r = -.27$) and guilt ($r = -.18$). These findings indicate that when adolescents eat for physical reasons, they report experiencing positive emotions more strongly and fewer negative emotions.

Trust in Internal Hunger/Satiety Cues. This factor was related negatively to BMI ($r = - .17$), but positively to body satisfaction ($r = .32$) and satisfaction with life ($r = .31$). These findings suggest adolescents who trust their bodies to tell them when and how much to eat tend to have lower body weight, and be more satisfied with their bodies and lives in general.

This factor was associated negatively with the extent to which the adolescents internalized societal ideals about attractiveness ($r = -.17$), and how much pressure they reported experiencing to lose weight ($r = -.25$), have a thin body ($r = -.23$), and diet ($r = -.31$). This factor, however, was unrelated to seeing anyone else engage in dietary restriction. These
findings suggest that adolescents who trust in their bodily cues report less internalization and the experience fewer pressures about body and weight.

As expected, this factor was positively related to happiness \((r = .18)\) and confidence \((r = .20)\) and negatively related to worthlessness \((r = -.24)\), sadness \((r = -.23)\) and shame \((r = -.15)\); there was no significant relationship with anxiety, anger or guilt. These findings suggest that when adolescents trust in their bodily cues, they report experiencing less shame, sadness, and worthlessness, and greater happiness and confidence.

Awareness of Internal Hunger/Satiety Cues. Scores on the Awareness factor \((M = 3.86, SD = .85)\) were higher than scores on the Trust factor \((M = 3.44, SD = .98)\), \(t(255) = -6.62, p < .001\), suggesting that adolescents are aware of their internal cues, but may not completely trust these internal cues.

Contrary to the other three factors, this factor was unrelated to most of the constructs examined in this study. This factor was weakly and positively related to the SWLS \((r = .13)\), as well as emotions such as happiness \((r = .15)\) and confidence \((r = .15)\). These findings suggest that adolescents who are aware of their bodily cues that may be happier and more confident, which may result in greater satisfaction with life.
The factor structure of the 21-item Intuitive Eating Scale (IES; Tylka, 2006) was examined across two independent samples of male and female middle school students to determine the extent to which it generalized to this age group. The EFA from Sample 1 and CFA from Sample 2 revealed support for a 17-item, four-factor model that closely paralleled the original three-factor model that was developed using samples of female undergraduates. As expected the factors were correlated, internally consistent, and generally unrelated to various demographic variables, such as age, gender, and race/ethnicity.

The first factor, Unconditional Permission to Eat, which reflects a willingness to eat in response to internal hunger cues and the food that may be desired, consisted of 9 items in the original study (Tylka, 2006). In the current study, however, 3 of those items were dropped due to low factor loadings or high residuals: Item 4 (“If I am craving a certain food, I allow myself to have it”), Item 9 (“I feel okay with myself when I eat something unhealthy”), and Item 21 (“My parents don’t keep certain foods in the house/apartment because they think I may lose control and eat them”). Item 9 may not have loaded because children at this age likely still look to their parents to determine what is healthy or unhealthy and thus think about food more in terms of how it tastes than its healthfulness. In support of this contention, Stevenson et al. (2007) found that adolescents preferred foods that they thought tasted good, regardless of its health value. Items 4 and 21 may not have loaded because they imply a certain level of control in choosing food that adolescents at this age may not have, but college students, who comprised the initial development sample in the Tylka (2006) study, would. In fact, Stevenson et al. (2007) found that the majority of adolescents in their study reported little to no involvement in choosing or
preparing foods that were kept in the home; what the adolescents ate, particularly if it was going to be healthy, was under their parents’ control. Although these three items from the original nine were dropped during our analyses, no new items loaded on the factor so, even for middle school students, it does represent the core construct of unconditional permission to eat as described by Tylka (2006), just with fewer items.

There was a small, but significant positive relationship between age and Unconditional permission to eat, suggesting that older adolescents feel more able to select the foods they want and are more likely to respond to their internal hunger cues. This finding may be related to the growing independence that adolescents experience as they get older and parents become less controlling of what they do (and what they eat) and they get more freedom to make choices for themselves (Stevenson et al., 2007). Parental restrictions and controls in regards to eating tend to be associated with higher levels of eating disturbances (e.g., eating in the absence of hunger; Carper, Fisher & Birch, 2000; Fisher & Birch, 2002, Francis & Birch, 2005), but when children and adolescents are given more autonomy to choose what and when to eat, they tend to be more responsive to their internal hunger and satiety cues, which allows them to self-regulate their intake and develop more adaptive eating behaviors (Fisher, Rolls & Birch, 2003).

This factor was related inversely to several constructs (e.g., BMI, pressure for thinness); the boys and girls who did not restrict their eating choices tended to have a leaner body, reported experiencing fewer societal and familial messages, pressures, and behaviors that promote dieting and the need to have a thin body. These findings are consistent with Tylka (2006), who found that unconditional permission to eat had moderate to strong negative correlations with disordered eating (i.e., EAT-26 scores), pressure for thinness, internalization, interoceptive awareness, and BMI. Among children and adolescents, dietary restraint, which is in many ways the opposite of
feeling free to eat what one wants, is related to experiencing more perceived pressures about body, weight, and appearance, and higher BMIs (Ricciardelli, et al., 2003; Sim & Zeman, 2006; Tremlay & Lariviere, 2009). When adolescents are subjected to fewer pressures and don’t internalize societal ideals about body, appearance, and eating, they are more aware of what they are feeling and are able to eat what they want (when they want). This adaptive self-regulatory process is likely associated with intake of healthier foods, which in turn may lead to a leaner, healthier body.

This factor also was related to body satisfaction and confidence, and the experience of fewer negative emotions; the more the boys and girls felt unrestrained in their eating, the more satisfied they were with the size and shape of their bodies (but not with their lives in general) and more likely to report being happy and confident. Tylka (2006) found that college women who scored higher on this factor tended to be more satisfied with their lives and their bodies and reported higher self-esteem and optimism. Among male and female adolescents, Bearman, Presnell, Martinez and Stice (2006) found that body dissatisfaction was associated with higher levels of dietary restraint. Adolescents who feel good about how they look may place fewer restrictions on their eating behaviors because they are not responding to internal or external pressures to change their bodies. In other words, because they are not motivated to restrict their food intake to achieve a thin ideal, they allow themselves to eat as they want. Taken together, these findings suggest that the unconditional permission to eat factor (a) generalizes to middle school boys and girls, though is best represented by fewer items, and (b) is associated with a range of positive psychological outcomes, such as body satisfaction, positive emotions, less pressure and internalization, higher self-esteem, and a leaner body composition (Augustus-Horvarth & Tylka, 2011; Avalos & Tylka, 2006; Tribole & Resch, 1995; Tylka, 2006).
The original second factor, Eating for Physical rather than Emotional Reasons, consisted of 6 items that reflect the ability to use food to satisfy hunger rather than as a way to cope with emotional distress (Tylka, 2006). In the current study, item 2 (“I stop eating when I feel full [not overstuffed]”) was dropped because it did not load significantly. This item is different from the other five items on the factor, each of which refers to eating in relation to some emotional state. In fact, in Tylka’s study, it had the lowest loading on this factor and seems more similar to items on the reliance on internal satiety/hunger cues factor (e.g., “When I am eating, I can tell when I am getting full”). The lack of loading also may be due to the fact that young adolescents still rely on parents to determine when to start and/or stop eating and simply may not have developed the internal mechanisms to adequately monitor and respond to feelings of fullness (Edmonds & Hill, 1999). Regardless, for young adolescents, this factor retains its general meaning, though does so without the inclusion of the one item.

There were significant gender differences on this second factor; girls were more likely than the boys to use food to cope with their emotions. Previous research suggests that although both adolescent girls and boys use food to cope, girls are more likely to consume foods that are higher in fat and sugar, which tend to be the foods eaten during binges and may suggest an emotional form of eating (Nguyen-Michel, et al., 2007; Nguyen-Rodriguez, et al., 2009). In addition, the boys and girls who scored higher on this factor had a lower BMI, and reported less internalization of societal ideals about appearance, fewer pressures to lose weight, diet and have a thin body, and fewer negative (e.g., sadness, anxiety) and more positive (e.g., happiness, confidence) emotions. Given the established relationship between emotional eating and binge eating (e.g., Allen et al., 2000), it makes sense that adolescents who eat primarily when they are hungry (rather than in response to how they are feeling) would report being happier, be less
likely to overeat, and have a leaner body. Adolescents who do not have healthy coping mechanisms to deal with societal, familial, and interpersonal pressures, may turn to food as a ready and easily accessible salve for their frustrations, hurt, and sadness (Allen et al., 2008; Burrows & Cooper, 2002; Goosens et al., 2009; Jenkins, Rew, & Sternglanz, 2005; Nguyen-Rodriguez et al., 2009; Sim & Zeman, 2006). And when they do, they may start a cycle of binge eating and weight gain that moves their bodies further from the societal ideal such that they experience even more pressures about their eating and weight from family, which shifts them even farther away from healthy, adaptive eating.

This factor was related positively to body satisfaction and satisfaction with life, which is consistent with Tylka’s (2006) findings with female undergraduates and the connection that has been established between emotional eating, depression and body dissatisfaction (Bearman et al., 2006; Braet et al., 2008; Goosens et al., 2009; Ricciardelli et al., 2003; Sim & Zeman, 2006). For example, Sim and Zeman (2006) found that girls (ages 12 to 15 years) who had higher levels of body dissatisfaction and had difficulties with emotional awareness tended to have an increased risk of disordered eating, such as eating in the absence of hunger and to soothe negative emotions. Adolescents who eat for physical reasons may be aware of and understand their feelings, and apply healthy and positive coping skills, such as seeking emotional support from others and setting realistic goals, so they do not have to rely on eating to soothe themselves. By coping effectively with their emotions, they are able to eat to satisfy their hunger and caloric needs and thus maintain a healthy body weight, which is associated with feeling satisfied with their body size and shape (Burrows & Cooper, 2002; Ricciardelli et al., 2003).

The original third factor, Reliance on Internal Hunger/Satiety Cues, consisted of 6 items and reflected an awareness of internal hunger and satiety cues and a trust in those cues to guide
eating behaviors. In the current study, the items comprised not one, but two distinct factors: Awareness of Internal Hunger/Satiety Cues (3 items; degree of awareness of internal cues) and Trust in Internal Hunger/Satiety Cues (3 items; belief in those cues to guide eating behavior). In addition, the adolescents in the current study reported a greater level of awareness of their hunger and satiety than they had trust in these internal cues. These findings suggest that not only do adolescents experience awareness and trust as separate dimensions in understanding and relying on their internal hunger and satiety cues, but that at this age, they are more aware than they are trusting. This distinction may be because adolescents have limited control with regard to their food intake, such as not having control over the foods that are available to them and parents determining when (and often what) they will eat. So even though they may be aware of the physical sensations of hunger and fullness, they may be receiving messages (e.g., “you can’t be hungry, you just ate” or “you need to finish what’s on your plate before you leave the table”) from parents or other authority figures that undermine their trust in these internal cues. It may not be until late adolescence or early adulthood, when individuals have more control over their access to food, that these two concepts become integrated and equally important as an adaptive eating process.

There were significant race/ethnicity differences, indicating that Caucasians have a higher level of trust in their internal cues than minority adolescents. Tylka and colleagues (Augustus-Horvarth & Tylka, 2011; Avalos & Tylka, 2006; Tylka, 2006; Tylka & Wilcox, 2006) have not examined racial/ethnic differences in previous studies, so there are no data for direct comparison. The minority students in this study were mainly African Americans and Hispanics, both of which represent cultures that are more collectivistic in nature, with a focus on the importance and influence of family, particularly parents and elders (Kumanyika, 2008). As such,
the parents in these cultures may have more influence and control over eating behaviors and food availability, which may impact these adolescents’ ability to learn to trust that their internal cues are accurate. If minority adolescents have less trust in their bodies’ internal hunger and satiety mechanisms, they may be prone to overeat and thus, be at a greater risk of becoming overweight (CDC, 2011; Kumanyika, 2008; Spruijt-Metz, 2011). Future research should examine these racial/ethnic differences, such as among adults and in relation to how these differences contribute to weight gain over time.

The adolescents who scored higher on this factor, regardless of racial/ethnic status, were leaner in terms of body composition, less likely to internalize societal ideals about appearance and weight, felt fewer pressures to lose weight, diet and have a thin body, and experienced fewer negative (e.g., worthlessness, sadness, shame) and more positive (e.g., happiness, confidence) emotions. Environments in which pressures and messages about weight, dieting, and appearance are minimal likely support the development of trust in hunger and satiety cues; that is, adolescents are able to focus on what their bodies are telling them with respect to being hungry or full because they are not feeling pressured to restrict what they eating so they might attain some unrealistic body ideal. This factor also was positively related to greater satisfaction with body size and shape and with life in general, which suggests that when adolescents feel better about themselves, they may be more capable of trusting their bodies to determine when they are hungry and when they are full.

On the fourth factor, the adolescent girls had a greater awareness of their internal hunger and satiety cues than did the boys. Contrary to the other three factors, this factor was unrelated to most of the physical and psychosocial constructs examined in this study. However, adolescents who were more aware of their bodily cues reported higher levels of happiness and
confidence, and greater overall satisfaction with their lives. Similarly, Burrows and Cooper (2002) found that adolescents who were more aware of and use internal, rather than emotional and external, cues to guide eating behavior, tended to have higher self-esteem and fewer symptoms of depression.

Clinical Implications

Several clinical implications are suggested from the results of this study. First, the four-factor intuitive eating scale appears to be a reliable and valid measure for this age group, offering a way to assess adaptive eating processes accurately. Previous research (Eneli, Crum, & Tylka, 2008) has suggested that caregivers should encourage children to self-regulate their eating by trusting their internal hunger and satiety cues. The modified IES provides practitioners with a mechanism for assessing children’s and adolescents’ adaptive eating processes (as measured by the four factors) and thus targeting their interventions to the areas that are least developed.

Second, because adolescents distinguish between awareness and trust of their internal cues, and report having greater levels of awareness than trust, interventions can focus on creating home and eating environments in which the messages provided by parents are consonant with developing the adolescents trust in their awareness of being hungry and/or full. Although children are naturally aware of when they are hungry and full (Birch & Fisher, 2003), trusting those cues occurs over time and is highly influenced by the psychosocial environment they experience when eating. Teaching parents and other caregivers how to communicate messages that supports the development of trust will be essential for establishing adaptive eating patterns into adulthood. Third, although the girls in this study were more aware of their hunger cues than the boys, they also were more likely to engage in emotional eating. Practitioners should be aware of this tendency of girls to eat in response to negative feelings, especially given the
emotional ups and downs that are common in this age group. Counselors might develop programs that teach adolescent girls about using their hunger cues as a guide for eating and provide these girls with more proactive coping skills so they do not turn to food when they are experiencing negative emotions.

Limitations and Directions for Future Research

There are several limitations of this study that warrant discussion. First, the current study focused on middle school adolescents ranging in age from 11 to 15 years old. Thus, it does not account for any differences in intuitive eating in younger children or older adolescents. Future research should examine the factor structure of the IES in these populations to determine the extent to which the original three or modified four-factor solutions apply. It would be important to determine if children’s experiences are similar to the early adolescents in this study and if high school students are more similar to the college students in Tylka’s (2006) original study.

Second, there was no measure of social desirability included in this study, so we could not determine the extent to which the boys and girls were presenting themselves in a favorable light through their responses on the IES. Especially in middle school, impression management is extremely important (Huon, et al., 2000; Huon & Walton, 2000) because adolescents are highly influence by their peers. Even though they were informed of confidential nature of the study and were allowed to complete the measures in private, their responses to the IES may have been influenced by the extent to which they wanted to respond in a manner they thought would look the best to the researchers. Future research should examine the potential relationships between scores on the IES factors and measures of social desirability and impression management.

Third, although we established relationships between the IES factors and other measures of psychosocial functioning to examine the scales’ discriminant and concurrent validity, we did
not include a similar measure of healthy eating, so convergent validity could not be established as was the case in the Tylka (2006) study. The IES is the first measure of intuitive eating, so additional studies should be conducted to test more directly its convergent validity, such as including behavioral observations of how adolescents eat and real time reports of emotions when eating. In addition, the IES could be incorporated into longitudinal studies of healthy eating. Given the increasing problem of obesity, especially in children and adolescents, using the concept of intuitive eating in long-term obesity prevention or treatment studies may help improve interventions and determine the efficacy of intuitive eating in relation to treating obesity. Such studies could increase our understanding of the development of healthy eating behaviors in children.

Conclusion

The current study provided support for two of the original factors of the IES – Unconditional Permission to Eat and Eating for Physical rather than Emotional Reasons – and demonstrated that the third original factor, at least for middle school boys and girls, might be more accurately defined as two – trust and awareness. These factors were internally consistent, and initial analyses provided support for their validity in relation to body composition, body satisfaction, life satisfaction internalization of the societal ideals, pressures for thinness, and positive and negative emotions. These findings support the notion that intuitive eating is a viable concept for young adolescents and the IES can be used to examine adaptive eating behaviors in this population. Future studies might examine intuitive eating in children and high school students to determine how and when adaptive eating attitudes and behaviors go awry and contribute to the development of disordered eating.
APPENDIX A

LITERATURE REVIEW
Intuitive Eating Scale: An Examination Among Adolescents

Current perspectives on eating behaviors have emphasized pathology, and research has focused on exploring the prevalence, causes, and factors associated with the emergence of disordered eating rather than on determining what contributes to the development of healthy, adaptive eating (e.g., Burrows & Cooper, 2002; Kostanski & Gullone, 1999; Striegel-Moore & Bulik, 2007; Wilksch & Wade, 2010). In most instances, when healthy eating is discussed, it has been defined simply as the lack of eating disorder symptoms (e.g., Mintz & Betz, 1988; Tylka & Subich, 1999), rather than as an adaptive, independent behavioral process. Such an approach, however, is inconsistent with counseling psychology’s focus on strengths and positive qualities that contribute to and/or maintain health (Seligman & Csikszentmihalyi, 2000). By viewing eating from this positive perspective, counseling psychologists and other professionals (e.g., dieticians) can work to promote healthy behaviors and attitudes toward food.

In order to study healthy eating behaviors and attitudes, valid measurement of the constructs is crucial. Tylka (2006) developed a measure of intuitive eating, providing extensive information about the questionnaire’s psychometric properties in her study with female undergraduates. Since that original study, this scale has been used only with adult women (e.g., Avalos & Tylka, 2006; Tylka & Wilcox, 2006), neglecting other populations, such as children and adolescents. Testing and validating this measure in children and adolescents is an important next step in this line of research because adaptive eating often goes awry during late childhood and early adolescence and it is during this time period that problematic eating behaviors, such as dieting and fasting, may begin (de Castro & Goldstein, 1995; Edmunds & Hill, 1999).
Birch and Fisher (1998) suggested that genes and the social environment influence eating, including food preferences and caloric intake. For example, infants appear to be born with an innate ability to regulate their caloric consumption. When given formula that is more energy-dense than they might usually have, they will adjust their intake so as not to consume more than they need (Birch & Fisher, 1998). This ability to adjust intake also is present among older children. Munsch et al. (2007) found that 8- to 12-year-old children were able to regulate their intake during a subsequent meal after a preloading of chocolate milk. They also found that the children’s caloric intake was predicted by their mothers’ caloric intake even though mother and child were not tested in the same room, suggesting that eating styles may be genetically influenced and thus present in families.

At birth, infants show a preference for sweet tastes, they reject sour and bitter tastes and are neutral to salt solutions (Capaldi & VandenBos, 1991). For example, Beauchamp and Moran (1982) found that infants who were fed a sweetened water solution shortly after birth consumed more sweetened water at 6 months old than those infants who had not received the sweetened water shortly after birth, suggesting that exposure to sweet flavors can highly influence the development of taste preferences.

When infants are breastfed, they are exposed to a variety of flavors from their mothers’ diet that are transmitted through the breast milk. Exposing infants to such varied flavors through their mothers’ milk can lead to greater acceptance of new foods and flavors later on (Sullivan & Birch, 1994). Up until the age of 2, most children will eat almost anything and their preferences tend to increase for the food they eat. As new foods are introduced and new tastes are acquired, children learn to like and eat what becomes familiar to them, although children may need many
exposures to new food before they develop a preference for it (Capaldi & VandenBos, 1991). For example, foods that parents keep in the house become familiar to children and thus are incorporated into their diet (Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007). Given this progression of acquiring new tastes, infancy and early childhood would be an effective time for parents to incorporate healthy foods into their children’s diets in order to establish these preferences from a young age.

In addition, children may learn food preferences and eating behaviors through modeling (Huon, Lim, & Gunewardene, 2000; McClain, Chappuis, Nguyen-Rodriguez, Yaroch, & Sprujt-Metz, 2009; Tremblay & Lariviere, 2009). Whether with peers or parents, observing others eat foods that they like or dislike (and their reactions to those foods) can affect children’s consumption patterns. Kroller and Warschburger (2009) found in a sample of 556 children (ages 1 to 10 years) and their mothers, that modeling led to healthier eating in the children. The authors argued that healthier eating occurs because parents explicitly model the intake of healthy, as opposed to unhealthy, foods.

In promoting healthy eating behaviors in children, it is the parents’ responsibility to provide their children with healthy food options and a supportive eating environment in which to make such choices, and it is up to child to choose what, when, and how much to eat (Birch & Fisher, 1998). Allowing children the freedom to choose their own food gives them the opportunity to learn how to moderate their own intake and to develop healthier, more adaptive eating habits. Providing children with the opportunity to become aware of their own dietary needs and to develop healthy eating habits at a young age makes it significantly more likely that this awareness and these behaviors will carry forward into adulthood. However, not all children
are raised in environments that foster healthy approaches to eating, so many children may
develop attitudes about food that lead to the emergence of unhealthy eating in the future.

Because humans are born with the innate potential to develop healthy eating habits (Birch
& Fisher, 1998), environmental factors appear to play a pivotal role in determining whether or
not such potential is realized. Being exposed to a variety of healthy foods and to models (e.g.,
parents) who eat healthfully provides children with positive experiences through which they
become aware of their caloric needs and learn to adjust their intake accordingly. Thus, when
children are not given healthy foods, are exposed to poor eating role models, and have less
control over their own intake, unhealthy eating habits are likely to emerge. The following
section provides more detailed evidence about the precursors of unhealthy eating.

Precursors to Unhealthy Eating

In the U.S., messages and values, which are communicated through the media, family
members and friends, about controlling food intake, losing weight through extreme dietary
restraint, and attaining a thin body ideal are ubiquitous; they are part of the social fabric and
define, in some part, what it means for children and adolescents to be male or female.
Adolescents are particularly vulnerable to these messages, because peers are highly influential
and their bodies are growing and changing as they go through puberty, with girls generally
moving farther away from the societal ideal as a result (Dohnt & Tiggemann, 2006; Striegel-
Moore & Bulik, 2007). When these messages are internalized, body dissatisfaction often results
as does the tendency to change dietary and exercise behaviors. In the U.S., dieting (i.e.,
restrictive eating) and distorted body image tends to be the norm, particularly for girls and
women (Eisenberg, Neumark-Sztainer, Story & Perry, 2005; Grigg, Bowman, & Redman, 1996;
Polivy & Herman, 1987; Rodin, Silberstein, & Striegel-Moore, 1984), which means that it is not
uncommon for children, adolescents, and adults to develop unhealthy eating habits as a result of unsuccessful dieting attempts. 

Although some individuals might believe that children do not understand what dieting is, in fact they do. For example, Kostanski and Gullone (1999) found that children can define accurately what dieting means, and Shunk and Birch (2004) found that children as young as 7 years old engaged in a wide range of restrictive behaviors. The fact that children are aware of, and engage in, dieting at very young ages suggest that environmental factors may be influencing their behaviors, moving them away from their innate adaptive eating patterns. In the sections that follow, I discuss the different factors that may contribute to the development of unhealthy eating behaviors.

Environmental influences. The prevalence of obesity in minorities is significantly higher than for non-Hispanic white children (Center for Disease Control, 2011; Kumanyika, 2008; Spruijt-Metz, 2011), suggesting that the certain environmental factors may predispose children towards unhealthy eating and obesity. Specifically, Mexican American boys and girls and non-Hispanic black girls tend to have the highest rates of obesity; for non-Hispanic black girls, this may be due in part to a higher level of fat and fast food consumption and lower physical activity levels than non-Hispanic white girls (Kumanyika, 2008). These findings may be related to cultural attitudes toward body weight and eating behaviors.

Cultural attitudes have been identified not only in ethnic minority populations but also in low income and rural populations (Kumanyika, 2008; Spruijt-Metz, 2011). In a population of primarily white low-income mothers in northern Kentucky, one study found that most of the mothers believed that it was healthier for infants to be heavier and they tended to introduce cereal and solid foods into the infants diet early than is recommended by health professionals.
These mothers also tended to overfeed their infants, thought their infants were hungry at the same time they were and used food to reward behavior or calm them when they were being fussy. The mothers were not aware of an upper limit of acceptable infant weight and often feared their infant to be underweight even though the infant was clearly not underweight (Baugcum, Burklow, Deeks, Powers, & Whitaker, 1998).

Taken together, the above findings suggest that attitudes toward body weight and eating behaviors can be influenced by environmental factors such as ethnicity, and socioeconomic status, and these attitudes tend to be transmitted from generation to generation (Kumanyika, 2008; Bentley, Gavin, Black & Teti, 1999). These attitudes can predispose a child toward unhealthy eating and obesity, which can have significant effects on their health and psychological well-being (Spruijt-Metz, 2011). Thus, teaching parents early on about healthy eating and appropriate infant feeding practices may help to decrease the prevalence of obesity in ethnic minority and low-income populations.

Parental modeling. Parental modeling can influence the emergence of dieting behaviors, particularly in children, whereas peer modeling appears to be more important for adolescents (Huon et al., 2000). In support of this idea, Kroller and Warschburger (2009) found that older children were less influenced by the modeling of food intake by their mothers. Thus, modeling may be more influential in younger children because they are regularly in the presence of their parents during feeding times; when young children are developing eating behaviors, they look to their parents to determine which foods they should be eating, further establishing parents’ influence (Johannsen, Johannsen, & Specker, 2006). Because adolescents tend to be involved in more peer relationships than children and often have increased access to unhealthy foods, the
impact of parent modeling is lessened while the influence of peers is heightened (Huon & Walton, 2000).

Food preferences and labels. Children’s food preferences become ingrained over time and are influenced by familiar foods, that is, the foods to which they have been consistently exposed in their homes (Birch & Fisher, 1998; McDermott, et al., 2009). If these familiar foods are energy-dense (i.e., high-fat, high-carbohydrate), then these food preferences can influence children’s weight and later acceptance of more nutritious food choices. Often these energy-dense foods are labeled as “bad” and healthy foods, such as fruits and vegetables, as “good.” When the preferred foods are considered bad, consumption of these foods may lead to a negative self-perception of engaging in unhealthy, or “bad,” eating. Because healthy foods are considered “good” but may not be preferred by children, healthy eating is often viewed by children as an unpleasant, unnatural activity used in the short-term to ward off obesity and increase attractiveness (Stevenson et al., 2007). Dichotomizing foods into positive and negative categories could potentially lead to more dietary restraint and guilt after consuming a “bad” food, setting the stage for future binge eating and other potential eating problems.

Parental encouragement to diet. Wertheim, Martin, Prior, Sanson and Smart (2002) found that parental encouragement to diet (i.e., making critical comments about adolescent’s weight or directly encouraging weight loss by telling an adolescent to eat less) had a stronger effect on adolescents’s eating than did the modeling of dieting behaviors. This encouragement to diet resulted in increases in drive for thinness, and body dissatisfaction. These results were present for adolescents regardless of their weight status, meaning that adolescents who were either normal weight or overweight experienced these increases when they were encouraged to diet by their parents.
Parental encouragement does not actually have to be real, just perceived by children to have an effect on eating behaviors. This perceived encouragement has been shown to lead to higher levels of eating restraint and body dissatisfaction in both boys and girls and it appears to have a larger effect in children between the ages of 9 and 10 years old than those who are between the ages of 7 and 8 years old (Anschutz, Kanters, Van Strien, Vermulst & Engels, 2009). The authors suggested that although younger children (ages 7 to 8 years old) perceive this encouragement to be thin, their perception is not likely to result in behavioral changes at that age. Over time, however, as children are exposed consistently to this encouragement, they may begin to internalize it and become more likely to develop unhealthy body attitudes and eating behaviors.

Controlling feeding practices. As stated previously, infants appear to be born with an innate ability to regulate their energy intake (Birch & Fisher, 1998). However, this tendency can be overridden by parental control. Although many children are aware of and respond to their internal hunger and satiety cues, feeding practices that either restrict or encourage consumption of certain foods may lead to a decreased reliance on these internal cues, and a subsequent increase in eating in the absence of hunger.

When parents encourage children to focus on external factors related to eating, such as finishing the food on their plate or prompting them to eat because it’s “dinner time,” children develop a decreased responsiveness to the energy content of the food (i.e., ignoring satiety cues and eating in the absence of hunger), spend more time eating, and gain weight (Carper, Fisher & Birch, 2000; van Strien & Bazelier, 2007; Webber, Hill, Saxton, Van Jaarsveld, & Wardle, 2009). For example, when served a large portion of food and expected to finish the food on their plate, children increased their overall caloric intake by up to 15% (Fisher, Rolls, & Birch, 2003).
However, when children were allowed to self-select their own portions, they ate significantly smaller amounts of food, which suggests that giving children permission to serve themselves may decrease overall food intake (through smaller portions) and increase emphasis on internal hunger and satiety cues.

Restrictive feeding practices. In general, food restriction leads to an increased liking for, and intake of, that particular food, rather than the preferred decrease in consumption (Birch & Fisher, 2007; van Strien & Bazelier, 2007). In fact, restricting access to certain foods may lead to overconsumption of those items. Jansen, Mulkens and Jansen (2007) found that children (age 5 to 6 years) who were in the “prohibition” group, after just five minutes, demonstrated an increased desire to eat the foods that were being prohibited. Although overall caloric intake was not significantly different between the prohibition group and the control group, the children who had been restricted from eating a certain food consumed significantly more of that food than those who had no restriction. The authors suggested that children may develop an obsessive interest in the restricted food that will not go away until they gain access to, and overconsume, the restricted item.

Fisher and Birch (2002) found that restrictive feeding practices (i.e., restricting access to certain foods, controlling when and how much a child can consume) predicted eating in the absence of hunger. Birch, Fisher and Davison (2003) found that for girls whose mothers reported using more restrictive feeding practices when their daughters were 5 years old and already overweight, these girls showed the largest increase in consumption levels by 9 years old. Similarly, Fisher and Birch (2002) found that girls who ate relatively more in the absence of hunger at age 5 were 4 times more likely to eat in the absence of hunger at age 7, significantly increasing their risk of being overweight. These findings, which are supported by other research
(e.g., Francis & Birch, 2005), suggest that these restrictive feeding patterns have enduring effects on children’s ability to use internal cues to regulate their food intake.

In a meta-analysis, Faith et al. (2004) found that parental feeding restriction was the only feeding practice that was associated with increases in children’s eating and weight status. Birch and Fisher (2007) found that in 5-year-olds, the mothers’ use of self-restraint and food restraint for daughters was related significantly to the overweight status of their daughters, and led to less self-control of food intake and increased consumption of more energy dense snack foods.

Parents’ use of restrictive feeding practices appears to be influenced, at least in part, by their perception that children may be at risk for developing an eating or weight problem and thus need their assistance. Unfortunately, such restriction may lead to a vicious cycle where children eat more and then gain weight, which is followed by parents using more stringent restrictive feeding practices, and subsequent increases in children’s weight and poor eating behaviors.

Parental weight concern. When parents diet and use other weight control techniques, such as restricting their own intake and access to certain foods, it is not uncommon for them to expect similar behaviors from their children (Birch & Fisher, 2007; Francis, Hofer, & Birch, 2001; Tremblay & Lariviere, 2009; Wertheim, et al., 2002). For example, mothers who restrain their own eating tend to exert more control over their daughter’s intake than mothers who do not restrict their own eating (Tiggemann & Lowes, 2002). This same effect was not seen in boys, which the authors suggested may be because boys’ feeding behaviors do not remind mothers of their own weight concerns. This control does not always need to be communicated overtly; it may be enough if children perceive the control over their eating and weight. This perception of maternal weight control can lead to higher levels of dietary restraint in children (Anschutz et al.,
2009), suggesting that when boys and girls perceive their mothers as emphasizing appearance and engaging in weight control behaviors, they may adopt these same beliefs and behaviors.

Whether healthy or unhealthy, weight-control behaviors can influence the development of similar behaviors in adolescents. In a sample of overweight adolescents, Cromly, Neumark-Sztainer, Story and Boutelle (2010) found that parents’ use of healthy weight-control behaviors, such as eating fewer calories, eating more fruits and vegetable and increasing exercise, predicted an increased emphasis on thinness within their adolescent children. Parents’ use of unhealthy weight-control behaviors (e.g., fasting, skipping meals, or taking laxatives), however, predicted their adolescent children’s body dissatisfaction. Thus, although weight control behaviors, in general, can have a negative impact on adolescents’ eating behaviors, the use of unhealthy, and often more extreme, weight control behaviors by parents seems to increase the severity of that impact.

Parental weight status. Parents’ overweight status can have negative effects on their children (Johannsen et al., 2006). When the mother is overweight and highly concerned about her daughter’s weight, she may use more restrictive feeding practices, which significantly increases her daughter’s eating in the absence of hunger as well as her BMI (Francis & Birch, 2005; Francis et al., 2001). When both parents are overweight, girls are 8 times more likely to be overweight by the time they are 13 years old, have a higher BMI and engage in disinhibited eating more often than when only one or neither parent is overweight (Francis, Ventura, Marini, & Birch, 2007). The authors suggested that this finding provides evidence for the contribution of both genetic and environmental input in daughter’s weight gain patterns and development of disinhibited eating. These effects have been explored more often in girls, so it is not clear if boys experience similar effects with overweight parents.
Negative affect. The relationship between negative emotions and binge eating in children and adolescents has been well established (e.g., Allen, Byrne, La Puma, McLean, & Davis, 2008; Carper et al., 2000; Czaja, Rief, & Hilbert, 2009; Goossens, Braet, Van Vlierberghe, & Mels, 2009; Macht & Simons, 2000). For example, in middle school kids, girls tend to emotionally eat when they are stressed, worried, or anxious, and boys emotionally eat when they are in a confused mood (Nguyen-Rodriquez, Unger & Spruijt-Metz, 2009). Using the same sample in a separate publication, Nguyen-Michel, Unger, and Spruijt-Metz (2007) reported that girls consumed more energy-dense salty foods whereas boys tended to increase their overall intake, especially with fruits and vegetables. This finding suggests that, perhaps in boys, emotional eating may not always lead to a high caloric intake because of the type of foods they choose to eat when experiencing these emotions. But for girls, emotional eating may increase consumption of specific foods that are familiar to them or are readily available, which may likely be unhealthy, energy-dense foods.

Among female adolescents, Sim and Zeman (2006) found that those who reported higher levels of disordered eating had significantly higher levels of negative affect, more difficulty identifying emotions, greater difficulty with emotional awareness, and difficulty with using positive coping skills. Similarly, Czaja et al. (2009) found that children who experienced a loss of control while eating tended to have maladaptive emotion regulation strategies. These findings suggest that when girls experience persistent negative emotions and struggle to identify and regulate those emotional states, they tend to be at a higher risk for using unhealthy eating behaviors as a way to cope.

In a sample of adolescents, Braet et al. (2008) found that overweight girls engaged in more emotional eating, and more general eating pathology (i.e., eating concern, drive for
thinness, and bulimia), than did those who were normal weight. Among overweight children who sought treatment for obesity, those children who had higher levels of anxiety and depression had increased levels of emotional eating; however, only those with higher levels of anxiety experienced a loss of control while eating (Goossens et al., 2009). The authors suggested that when children are anxious, they may use food as a means to cope with their tension and anxiety; when children are depressed, they may eat in an attempt to experience more positive emotions.

Influence of media. Exposure to food advertisements on television can affect the types of food children choose, being more likely to ask for the food to which they have just been exposed (Birch & Fisher, 1998). Harris, Bargh, and Brownell (2009) argued that watching television commercials increases the consumption of food regardless of the food in the commercial. They found that when children watched commercials that promoted snacking, fun, and excitement (which they argued are the majority of ads targeted at children), the ads directly contributed to their increased intake of food. In a large sample of 11 to 16-year-olds, both boys and girls who were higher on external eating had a positive association between television viewing and snacking. A similar association was found in boys, but not in girls, who were higher on emotional eating (Snoek, Van Strien, Janssens, & Engels, 2006). However, adolescents higher on restraint did not have an association between television viewing and snacking. Dohnt and Tiggemann (2006) reported that girls who watched more music video television and who were exposed to more teen and women’s magazines had more awareness of dieting and related behaviors.

Both television and magazines tend to promote awareness of dieting behaviors and of the thin-ideal, so it is not surprising that adolescent boys and girls would internalize these messages and adjust their behaviors accordingly. It is possible that this awareness (and internalization) of
societal ideals promotes negative affect, which could lead to increased intake if the adolescent does not have adequate coping skills. And, if they begin to gain weight as a result, there is a further discrepancy between their actual and ideal bodies, thus promoting more negative affect and the beginning of an unhealthy eating cycle (Kumanyika, 2008).

Body dissatisfaction. Given society’s emphasis on the thin-ideal and dieting, it is not surprising to find that children report body image concerns (Burrows & Cooper, 2002; Ricciardelli, McCabe, Holt, & Finemore, 2003) and that these concerns can influence eating behaviors as the children age. For example, in a sample of 5 to 8-year-old girls, Dohnt and Tiggemann (2006) found that about half the girls older than 6 years expressed a desire to be thinner; however, most were not actually acting on or directly affected by this desire, such as by restricting their caloric intake. This finding suggests that although children are aware of the thin-ideal, it may not influence their eating behaviors until they internalize the ideal, which appears to occur in late childhood and adolescence.

As girls go through puberty, their bodies change very rapidly, such as with increases in body fat and hip and breast development. These changes can be confusing to them and lead to their experiencing a range of negative emotions and outcomes. For example, when compared to prepubertal girls, postpubertal girls ate less food, had greater eating restraint, and had a more negative body image and greater dissatisfaction with their bodies (de Castro & Goldstein, 1995). Girls have a much higher risk of engaging in unhealthy weight control behaviors during and after the onset of puberty; however, boys are not immune to these risks either. Edmunds and Hill (1999) found that in a sample of 12-year-old boys and girls, 25% of the boys reported a desire to lose weight and 15% had dieted previously. They also found that girls who were dieting were more likely to skip meals and fast than those who were not dieting. As children become aware
of dieting and societal ideals about appearance and dieting through the socialization process, the stage is set for them to experience body dissatisfaction and potentially engage in unhealthy eating behaviors when they reach puberty.

Summary

There are multiple psychological and environmental factors that may have a negative influence on children’s and adolescents’ ability to develop and maintain healthy eating behaviors. Throughout childhood, parents (and other adults) have the most control over what and when children eat, and what is even available to them. When parents’ control is too rigid or restrictive, there is an increased risk of overeating and eating in the absence of hunger. Children begin to decrease their reliance on their physiological hunger cues and satiety and begin to eat based on external cues, such as flavor, portion size, and emotions. Once they reach adolescence and their bodies change physically, they begin to experience more body image concerns, which may lead them to alter their diets either to lose weight (e.g., restriction that occurs with many girls) or gain weight (e.g., such as for some boys who are trying to increase muscle mass).

These dietary changes further decrease their reliance on physiological cues of hunger and satiety. When individuals restrain their eating regularly, they may come to need more extreme levels of hunger and fullness before they become aware of it (Polivy & Herman, 1987). Thus, when adolescents restrain their eating, they need to be hungrier before they will eat and once they start eating, they are likely to consume significantly more than they would otherwise because they are not fully aware of being satiated. This way of eating, as is very common with those who engage in dieting, promotes a misperception of one’s internal bodily cues, which further separates that individual from healthy, intuitive eating.
Although there are several ways to eat healthfully, (e.g., consuming low-fat, low-calorie foods, incorporating more fruits and vegetables), the basis of any healthy eating is the ability to understand one’s internal cues for hunger and satiety and to eat only to fulfill physiological (as opposed to emotional) needs. This adaptive, or “intuitive,” approach to eating has been the focus of recent research, including the development of a measure designed to assess it. In the section that follows, I define intuitive eating, discuss research that has been done on it, and make the case for the need to extend this line of study into children and adolescents.

**Intuitive Eating**

Adaptive eating involves a reliance on internal cues, such as physiological feelings of hunger and fullness, to determine when and how much to eat rather than basing it on emotions or external cues, such as portion size or established meal times (i.e., eating lunch at noon). Tribole and Resch (1995) labeled this approach to eating “intuitive” because it encompasses an understanding of and response to physiological cues of hunger and satiety as well as less preoccupation with food. More specifically, researchers (Tribole & Resch, 1995; Tylka, 2006) have defined intuitive eating as representing three separate, but interrelated, adaptive behaviors: 1) unconditional permission to eat (readiness to eat in response to physiological hunger cues and to eat whatever food may be desired at the time); 2) eating for physical rather than emotional reasons (using food to satisfy physiological drives rather than as a coping mechanism for emotional distress); and 3) relying on physiological cues of hunger and satiety (awareness of physiological hunger and satiety cues and reliance on these cues to manage eating).

To provide researchers with a tool to measure this more adaptive, and healthy, approach to eating, Tylka (2006) developed the Intuitive Eating Scale (IES). Prior to her development of the IES, there was no reliable nor valid way to determine individuals’ perceptions about how
they approached eating, other than through an assessment of eating pathology to determine its absence. In her study, Tylka used a large sample of female undergraduates, and conducted both exploratory and confirmatory factor analyses to validate the three dimensions of intuitive eating previously described. She began with a pool of 28 items formulated by using empirical and theoretical literature on intuitive eating, unrestrained eating and how to promote adaptive eating. Once the items were formulated, Tylka consulted experts within the field (i.e., a counseling psychologist and a nutrition consultant) retardating content, clarity and parsimony. Through this process, all 28 items were retained, but 3 items were reworded for clarification. Further, she examined the factors in relation to a variety of demographic and psychological variables, and found that higher levels of overall intuitive eating were related to lower BMI, higher psychological well-being and self-esteem, better proactive coping skills, and lower depression and eating pathology.

More specifically, Tylka found that unconditional permission to eat was negatively related to measures of eating disorder symptomatology, specifically the Body Dissatisfaction (BD) and Interoceptive Awareness (IA) subscales on the EDI-2 and the Eating Attitudes Test (EAT); the strength of these relationships was moderate to strong. For eating for physical reasons and the reliance on internal cues, these factors had similar negative relationships with the BD and IA subscales, and the EAT, though the strength of the association was only small. For internalization of the thin ideal and body dissatisfaction, negative relationships again were found with all three factors, though the associations were strongest with unconditional permission to eat. Unconditional permission had moderate, positive relationships with self-esteem and satisfaction with life, but only a small positive association with optimism; it was not significantly related to proactive coping. Eating for physical reasons had a strong association with self-
esteem, and moderate relationships with optimism, proactive coping, and satisfaction with life. Finally, reliance on internal cues was found to have moderate correlations with satisfaction with life, self-esteem, optimism, and proactive coping.

These findings suggest that women with high levels of intuitive eating are likely to reject the societal thin-ideal, to be satisfied with their bodies, and perceive minimal pressure to be thin. Because these women are not likely to base their self-worth on being thin, but rather on what their bodies can do, they will have greater psychological well-being, including high life satisfaction, self-esteem, and optimism. Furthermore, women scoring high on the eating for physical reasons subscale may use more constructive strategies to deal with emotional distress, such as seeking support and using proactive coping, rather than using food to cope. Together, these findings suggest that adaptive, healthy eating coincides with myriad positive psychological outcomes, which is one reason why exploring intuitive eating in children and adolescence is important.

Subsequent research (Tylka & Wilcox, 2006) with college women has shown that two of the intuitive eating factors (i.e., eating for physical rather than emotional reasons and relying on physiological cues) were not related significantly to different measures of eating disorder symptoms (i.e., the Dieting and Bulimia/Food Preoccupation subscales of the Eating Attitudes Test), suggesting that these IE factors measure something other than disordered eating. Unconditional permission to eat, however, was related to various eating disorder measures, suggesting that women who eat unconditionally generally report fewer problems with disordered eating. The findings from these studies (Tylka, 2006; Tylka & Wilcox, 2006) suggest that the IES is a valid and reliable measure of intuitive eating that is defined by three specific behaviors. As such, they determined that the factors are not simply representations of the absence of
disordered eating, but actually measure more adaptive ways of approaching food intake.

Although initial studies on the scale’s psychometric properties have been supportive, the scale is limited in that it has not been tested with males or female adolescents or children.

**Purpose**

The purpose of the current study is to extend the work of Tylka (2006) by evaluating the factor structure and psychometric properties of the IES in a sample of middle school boys and girls. Tylka and colleagues (Tylka, 2006; Tylka & Wilcox, 2006) recommended that future studies examine the IES in other populations, because the 3-factor model that emerged for college women may not be the best fit for other populations, such as men and children. If used with other groups, they also recommended that the items on the IES be evaluated to ensure that they matched the developmental level of the population being studied. If not, they suggested appropriate modifications be made to item wording.

In the first study, the factor structure of the IES will be examined through exploratory procedures. An exploratory approach will be taken for two reasons. First, items on the IES were changed to reflect the reading level and experiences of the children and adolescents in this study. For example, the original item “I use food to help me soothe my negative emotions” was changed to “I use food to help me soothe my negative emotions, such as feeling sad or angry.” Second, the IES had been developed and evaluated with young adults and, in this study, it was being tested in a different population and it was not clear whether the same factor structure would apply.

In the second study, confirmatory factor analysis (CFA) will be used to examine the factor structure established in Study 1. Once the factor structure has been confirmed, the factors’
internal consistency reliability again will be determined. In addition, discriminant and concurrent validity will be determined.

Given previous research (Tylka, 2006), it is hypothesized that higher scores on the IES and the confirmed factors will be (a) unrelated to age, gender, race/ethnicity, and grade in school; (b) positively related to subjective well-being, and body satisfaction; and (c) negatively related to BMI, modeled behaviors regarding engaging in dieting behaviors in family, negative affect (i.e., worried, angry, sad), internalization of the societal thin ideal, and sociocultural pressures regarding losing weight, have a thin body, and dieting.
APPENDIX B

SUPPLEMENTAL TABLES
Table B.1

Study 1 Factor Loadings for Four-Factor Solution Using Principal Axis Analysis With Promax

Rotation: Means, Standard Deviations, Eigenvalues, Percentages of Variance, and Internal Consistencies (N = 259)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I try to avoid certain foods high in fat, carbohydrates, or calories I find myself eating when I’m feeling emotional (e.g., anxious, depressed, sad), even when I’m not physically hungry. I follow eating rules or diëting plans that dictate what, when, and/or how much to eat.</td>
<td>3.00</td>
<td>1.17</td>
<td>.67</td>
<td>-.17</td>
<td>.09</td>
<td>.01</td>
</tr>
<tr>
<td>3</td>
<td>I find myself eating when I’m feeling emotional (e.g., anxious, depressed, sad), even when I’m not physically hungry. I follow eating rules or diëting plans that dictate what, when, and/or how much to eat.</td>
<td>3.80</td>
<td>1.37</td>
<td>-.02</td>
<td>.78</td>
<td>-.03</td>
<td>-.00</td>
</tr>
<tr>
<td>5</td>
<td>I find myself eating when I am bored, even when I’m not physically hungry. I follow eating rules or diëting plans that dictate what, when, and/or how much to eat.</td>
<td>3.64</td>
<td>1.23</td>
<td>.49</td>
<td>-.07</td>
<td>-.21</td>
<td>.20</td>
</tr>
<tr>
<td>6</td>
<td>I find myself eating when I am bored, even when I’m not physically hungry. I follow eating rules or diëting plans that dictate what, when, and/or how much to eat.</td>
<td>3.51</td>
<td>1.35</td>
<td>-.13</td>
<td>.59</td>
<td>.03</td>
<td>.02</td>
</tr>
<tr>
<td>7</td>
<td>I can tell when I’m slightly full.</td>
<td>3.77</td>
<td>1.17</td>
<td>-.02</td>
<td>.02</td>
<td>-.07</td>
<td>.70</td>
</tr>
<tr>
<td>8</td>
<td>I can tell when I’m slightly hungry.</td>
<td>3.99</td>
<td>1.04</td>
<td>.06</td>
<td>-.08</td>
<td>.02</td>
<td>.58</td>
</tr>
<tr>
<td>10</td>
<td>I find myself eating when I am lonely, even when I’m not physically hungry. I follow eating rules or diëting plans that dictate what, when, and/or how much to eat.</td>
<td>4.09</td>
<td>1.18</td>
<td>-.04</td>
<td>.73</td>
<td>.04</td>
<td>.02</td>
</tr>
<tr>
<td>11</td>
<td>I trust my body to tell me when to eat.</td>
<td>3.73</td>
<td>1.17</td>
<td>.06</td>
<td>.14</td>
<td>.69</td>
<td>.08</td>
</tr>
<tr>
<td>12</td>
<td>I trust my body to tell me what to eat.</td>
<td>3.17</td>
<td>1.27</td>
<td>-.03</td>
<td>-.10</td>
<td>.83</td>
<td>.16</td>
</tr>
<tr>
<td>13</td>
<td>I trust my body to tell me how much to eat.</td>
<td>3.62</td>
<td>1.18</td>
<td>-.00</td>
<td>-.00</td>
<td>.60</td>
<td>.18</td>
</tr>
<tr>
<td>14</td>
<td>I have forbidden or “bad” foods that I don’t allow myself to eat. When I’m eating, I can tell when I am getting full.</td>
<td>3.37</td>
<td>1.25</td>
<td>.42</td>
<td>-.10</td>
<td>-.04</td>
<td>-.10</td>
</tr>
<tr>
<td>15</td>
<td>I use food to help me soothe my negative emotions, such as feeling sad or angry. I find myself eating when I am stressed out, even when I’m not physically hungry.</td>
<td>4.10</td>
<td>0.97</td>
<td>-.07</td>
<td>.03</td>
<td>.26</td>
<td>.38</td>
</tr>
<tr>
<td>16</td>
<td>I use food to help me soothe my negative emotions, such as feeling sad or angry. I find myself eating when I am stressed out, even when I’m not physically hungry.</td>
<td>4.07</td>
<td>1.20</td>
<td>.07</td>
<td>.80</td>
<td>-.11</td>
<td>-.05</td>
</tr>
<tr>
<td>17</td>
<td>I use food to help me soothe my negative emotions, such as feeling sad or angry. I find myself eating when I am stressed out, even when I’m not physically hungry.</td>
<td>4.07</td>
<td>1.23</td>
<td>-.02</td>
<td>.80</td>
<td>.05</td>
<td>-.04</td>
</tr>
<tr>
<td>18</td>
<td>I feel guilty if I eat a certain food that is high in calories, fat, or carbohydrates. I think of a certain food as “good” or “bad” depending on how much fat or how many calories it has in it. I don’t trust myself around fattening or high calorie foods.</td>
<td>3.52</td>
<td>1.35</td>
<td>.74</td>
<td>-.00</td>
<td>.15</td>
<td>-.04</td>
</tr>
<tr>
<td>19</td>
<td>I feel guilty if I eat a certain food that is high in calories, fat, or carbohydrates. I think of a certain food as “good” or “bad” depending on how much fat or how many calories it has in it. I don’t trust myself around fattening or high calorie foods.</td>
<td>3.14</td>
<td>1.32</td>
<td>.77</td>
<td>.07</td>
<td>-.05</td>
<td>-.07</td>
</tr>
<tr>
<td>20</td>
<td>I don’t trust myself around fattening or high calorie foods.</td>
<td>3.67</td>
<td>1.27</td>
<td>.51</td>
<td>.28</td>
<td>.00</td>
<td>.06</td>
</tr>
<tr>
<td>Eigenvalues</td>
<td>2.80</td>
<td>3.91</td>
<td>2.10</td>
<td>1.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of variance</td>
<td>16.44</td>
<td>22.99</td>
<td>12.33</td>
<td>7.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal consistencies (α)</td>
<td>.85</td>
<td>.78</td>
<td>.75</td>
<td>.60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Factor Correlations

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.26</td>
<td>.27</td>
<td>.07</td>
</tr>
<tr>
<td>Factor 2</td>
<td></td>
<td>.04</td>
<td>-.122</td>
</tr>
<tr>
<td>Factor 3</td>
<td>Factor 1</td>
<td></td>
<td>.40</td>
</tr>
<tr>
<td>Factor 4</td>
<td>Factor 2</td>
<td>Factor 3</td>
<td></td>
</tr>
</tbody>
</table>

Factor 1 – Unconditional Permission to Eat; Factor 2 – Eating for Physical rather than Emotional Reasons; Factor 3 – Trust in Internal Hunger/Satiety Cues; Factor 4 – Awareness of Internal Hunger/Satiety Cues.

Boldface indicates item loaded on this factor.
<table>
<thead>
<tr>
<th>Item</th>
<th>Factor Loadings</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I try to avoid certain foods high in fat, carbohydrates, or calories</td>
<td>.659</td>
</tr>
<tr>
<td>2</td>
<td>I find myself eating when I’m feeling emotional (e.g., anxious, depressed, sad), even when I’m not physically hungry.</td>
<td>.872</td>
</tr>
<tr>
<td>3</td>
<td>I follow eating rules or dieting plans that dictate what, when, and/or how much to eat.</td>
<td>.641</td>
</tr>
<tr>
<td>4</td>
<td>I find myself eating when I am bored, even when I’m not physically hungry.</td>
<td>.777</td>
</tr>
<tr>
<td>5</td>
<td>I can tell when I’m slightly full.</td>
<td>.842</td>
</tr>
<tr>
<td>6</td>
<td>I can tell when I’m slightly hungry.</td>
<td>.644</td>
</tr>
<tr>
<td>7</td>
<td>I find myself eating when I am lonely, even when I’m not physically hungry.</td>
<td>.856</td>
</tr>
<tr>
<td>8</td>
<td>I trust my body to tell me when to eat.</td>
<td>.833</td>
</tr>
<tr>
<td>9</td>
<td>I trust my body to tell me what to eat.</td>
<td>.863</td>
</tr>
<tr>
<td>10</td>
<td>I trust my body to tell me how much to eat.</td>
<td>.885</td>
</tr>
<tr>
<td>11</td>
<td>I have forbidden or “bad” foods that I don’t allow myself to eat.</td>
<td>.616</td>
</tr>
<tr>
<td>12</td>
<td>When I’m eating, I can tell when I am getting full.</td>
<td>.616</td>
</tr>
<tr>
<td>13</td>
<td>I use food to help me soothe my negative emotions, such as feeling sad or angry.</td>
<td>.958</td>
</tr>
<tr>
<td>14</td>
<td>I find myself eating when I am stressed out, even when I’m not physically hungry.</td>
<td>.982</td>
</tr>
<tr>
<td>15</td>
<td>I feel guilty if I eat a certain food that is high in calories, fat, or carbohydrates.</td>
<td>.789</td>
</tr>
<tr>
<td>16</td>
<td>I think of a certain food as “good” or “bad” depending on how much fat or how many calories it has in it.</td>
<td>.988</td>
</tr>
</tbody>
</table>
I don’t trust myself around fattening or high calorie foods.

Factor 1 – Unconditional Permission to Eat; Factor 2 – Eating for Physical rather than Emotional Reasons; Factor 3 – Trust in Internal Hunger/Satiety Cues; Factor 4 – Awareness of Internal Hunger/Satiety Cues.
### Table B.3
**Study 2 Correlation Matrix of Measured Variables and Demographic Variables (N = 256)**

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Total IES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td>-.30**</td>
<td>-.15*</td>
<td>-.17**</td>
<td>-.02</td>
<td>-.31**</td>
</tr>
<tr>
<td>Dieting Behaviors-Family</td>
<td>-.22**</td>
<td>-.05</td>
<td>.09</td>
<td>.004</td>
<td>-.12</td>
</tr>
<tr>
<td>Dieting Behaviors-Boys</td>
<td>-.04</td>
<td>-.07</td>
<td>.02</td>
<td>-.001</td>
<td>-.05</td>
</tr>
<tr>
<td>Dieting Behaviors-Girls</td>
<td>.02</td>
<td>.02</td>
<td>-.002</td>
<td>-.09</td>
<td>-.002</td>
</tr>
<tr>
<td>Dieting Behaviors-Media</td>
<td>.07</td>
<td>-.04</td>
<td>-.001</td>
<td>-.04</td>
<td>-.01</td>
</tr>
<tr>
<td>BPSS-Body</td>
<td>.27**</td>
<td>.33**</td>
<td>.32**</td>
<td>.05</td>
<td>.45**</td>
</tr>
<tr>
<td>PANAS-Happy</td>
<td>.02</td>
<td>.18**</td>
<td>.27**</td>
<td>.16*</td>
<td>.24**</td>
</tr>
<tr>
<td>PANAS-Anxious/Worried</td>
<td>-.15*</td>
<td>-.24**</td>
<td>-.09</td>
<td>-.07</td>
<td>-.27**</td>
</tr>
<tr>
<td>PANAS-Angry</td>
<td>-.06</td>
<td>-.16*</td>
<td>-.10</td>
<td>-.05</td>
<td>-.16**</td>
</tr>
<tr>
<td>PANAS-Worthless</td>
<td>-.25**</td>
<td>-.24**</td>
<td>-.23**</td>
<td>-.10</td>
<td>-.37**</td>
</tr>
<tr>
<td>PANAS-Confident</td>
<td>.13*</td>
<td>.25**</td>
<td>.20**</td>
<td>.16*</td>
<td>.32**</td>
</tr>
<tr>
<td>PANAS-Sad/Depressed</td>
<td>-.21*</td>
<td>-.40**</td>
<td>-.23**</td>
<td>-.07</td>
<td>-.43**</td>
</tr>
<tr>
<td>PANAS-Ashamed</td>
<td>-.19**</td>
<td>-.27**</td>
<td>-.15*</td>
<td>-.05</td>
<td>-.31**</td>
</tr>
<tr>
<td>PANAS-Guilty</td>
<td>-.19**</td>
<td>-.18**</td>
<td>-.11</td>
<td>-.07</td>
<td>-.26**</td>
</tr>
<tr>
<td>SATAQ</td>
<td>-.29**</td>
<td>-.29**</td>
<td>-.17**</td>
<td>-.004</td>
<td>-.38**</td>
</tr>
<tr>
<td>PSPS-lose weight</td>
<td>-.41**</td>
<td>-.24**</td>
<td>-.25**</td>
<td>-.09</td>
<td>-.47**</td>
</tr>
<tr>
<td>PSPS-thin body</td>
<td>-.39**</td>
<td>-.28**</td>
<td>-.23**</td>
<td>-.001</td>
<td>-.45**</td>
</tr>
<tr>
<td>PSPS-dieting</td>
<td>-.40**</td>
<td>-.26**</td>
<td>-.31**</td>
<td>-.07</td>
<td>-.49**</td>
</tr>
<tr>
<td>SWLS</td>
<td>.09</td>
<td>.23**</td>
<td>.31**</td>
<td>.13*</td>
<td>.31**</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

**Note.** Factor 1 – Unconditional Permission to Eat; Factor 2 – Eating for Physical rather than Emotional Reasons; Factor 3 – Trust in Internal Hunger/Satiety Cues; Factor 4 – Awareness of
Internal Hunger/Satiety Cues; Total IES – Total intuitive eating scale score. BMI = Body Mass Index; Dieting Behaviors-Family = Modeling of dieting behaviors by family members; Dieting Behaviors-Boys = Modeling of dieting behaviors from friends who are boys; Dieting Behaviors-Girls = Modeling of dieting behaviors from friends who are girls; Dieting Behaviors-Media = Modeling of dieting behaviors from individuals portrayed on TV and in magazines; BPSS-Body = satisfaction with body size and shape item; PANAS-X Happy = Positive and Negative Affect Scale Expanded Form Happy; PANAS-X Anxious = Positive and Negative Affect Scale Expanded Form-Anxious/Worried; PANAS-X Angry = Positive and Negative Affect Scale Expanded Form-Angry; PANAS-X Worthless = Positive and Negative Affect Scale Expanded Form-Worthless; PANAS-X Confident = Positive and Negative Affect Scale Expanded Form-Confident; PANAS-X Sadness = Positive and Negative Affect Scale Expanded Form-Sadness; PANAS-X Ashamed = Positive and Negative Affect Scale Expanded Form-Ashamed; PANAS-X Guilt = Positive and Negative Affect Scale Expanded Form Guilt Subscale; SATAQ = Sociocultural Attitudes Towards Appearance Scale-3 General Internalization Scale; PSPS-Lose Weight = Perceived Sociocultural Pressures Scale-Perceived pressure to lose weight subscale; PSPS-Thin Body = Perceived Sociocultural Pressures Scale-Perceived pressure to have a thin body subscale; PSPS-Diet = Perceived Sociocultural Pressures Scale-Perceived pressure to diet subscale; SWLS = Satisfaction With Life Scale.
REFERENCE LIST


9)28:2<226::AID-EAT13>3.0.CO;2-9


