The Intuitive Eating Scale: Development and Preliminary Validation

Steven Hawks, Ray M. Merrill, and Hala N. Madanat

ABSTRACT

This article describes the development and validation of an instrument designed to measure the concept of intuitive eating. To ensure face and content validity for items used in the Likert-type Intuitive Eating Scale (IES), content domain was clearly specified and a panel of experts assessed the validity of each item. Based on responses from 391 university students in the United States, the IES was evaluated for internal consistency and reliability using cross-tabulations, factor analysis, test–retest correlation coefficients, and logistic regression techniques. The factor solution isolated four factors that replicated scale construction, including intrinsic eating, extrinsic eating, antidieting, and self-care with alpha coefficients ranging from .42 to .93. Retesting after 4 weeks (N = 285) yielded correlation coefficients that ranged between .56 and .87. The presence of theorized relationships between IES scores and certain demographic and lifestyle variables (obesity, presence of an eating disorder, gender, and restrictive dieting) adds support for concurrent validity. IES subscales also correlated significantly with the Cognitive Behavioral Dieting Scale in predicted directions, suggesting convergent validity. Findings provide tentative support for the use of the IES in identifying intuitive eating attitudes and behaviors among college populations. Implications for practice, theory, and future research are discussed.

In the 1980s an antidieting movement began to take shape based on the assertion that restrained dieting (i.e., controlled meal plans, avoidance of taboo foods, and/or restricted intake of fat grams or calories) is not sustainable and may contribute to such negative outcomes as weight recycling, altered body composition, heightened fat storage potential, decreased resting metabolism, dysfunctional relationships with food, increased risk of eating disorders, low self-esteem, and an overall sense of failure among dieters (Gast & Hawks, 1998; Hawks & Gast, 1998, 2000). Proponents of the antidieting movement further argued that many individuals seemed to be capable of achieving a healthy body weight while maintaining an unrestrained relationship with food that did not include restrictive dieting (Schwartz, 1996). Informal assessments revealed that for these individuals food intake was based primarily on physical hunger cues, rather than on diet plans, environmental cues, emotional states, or other external factors (Hansen & Goodman, 1999; Podjasek & Carney, 1998). Such individuals came to be referred to as intuitive eaters, and intuitive eating has continued to grow in popularity as an alternative to dieting (Gast & Hawks, 2000; Tribole & Resch, 1996).

In short, the concept of intuitive eating suggests that all individuals have within themselves a natural mechanism that if allowed to function will ensure good nutrition at a healthy weight (Schwartz, 1996). As individuals get in touch with this "inner guide" or access their "inner wisdom" they are more in tune with their body's physical needs and eat in a way that supports health, thinness, and nutrition, while at the same time avoiding overeating, obsessive food consumption, harmful dieting, or mindless

Steven Hawks, EdD, MBA, CHES, is an associate professor in the Department of Health Science at Brigham Young University, 229L Richards Building, Provo, UT 84602; E-mail: steve_hawks@byu.edu. Ray M. Merrill, PhD, MPH, is also a member of the Department of Health Science at Brigham Young University. Hala N. Madanat is a member of the Department of Sociology at Brigham Young University.

nibbling (Tribole & Resch, 1996).

This concept of intuitive eating has come to include several key attributes (Hansen & Goodman, 1999; Hirschmann & Munter, 1989; Podjasek & Carney, 1998; Schwartz, 1996; Tribole & Resch, 1996). The first is the ability to clearly recognize the physical signs of hunger, satisfaction, and fullness. The intuitive eater only eats when physically hungry, and stops eating when satisfied—well before fullness is reached. Second, the intuitive eater is capable of intuitively sensing the nutritional needs of the body. Because there are no taboo foods or restrictions on eating, the intuitive eater considers the full range of food possibilities and carefully weighs available choices against physical promptings. On any given day a chocolate shake may be desired, whreas on another day it might be cream of broccoli soup. In either case the nutritional urgings of the body are honored without reference to emotional states or external plans. Third, for the intuitive eater the physical effects of food consumption are carefully monitored in terms of satisfaction. Food is not consumed unconsciously while driving through rush hour traffic, but is instead fully appreciated as it satisfies the nutritional and hunger needs of the body. Fourth, as promoted in the self-help literature, intuitive eating has taken on a philosophical orientation that values the health and energy of the body more highly than the rewards of an attractive appearance. An intuitive eater is more likely to be concerned about the health benefits of fitness and proper diet composition rather than the social advantages of a lean figure. Finally, the intuitive eating philosophy continues to strongly reject restrictive dieting as a means for weight control, but instead commits individuals to mastering the elements of intuitive eating in an open, unrestrained relationship with food that promotes healthy weight management and positive self-esteem (Normandi & Roark, 1999).

The underlying assumptions of the intuitive eating paradigm are that the intuitive eater will develop a sound diet composition, healthy body weight, and favorable health indicators (blood lipid profile, blood pressure, etc.) as the principles of intuitive eating are mastered and put into long-term practice. It is further assumed that everyone is capable of eating intuitively and that anyone can be trained to do so if given proper instruction and if willing to devote the necessary time and energy to the endeavor (Hansen & Goodman, 1999; Hirschmann & Munter, 1988; Podjasek & Carney, 1998; Schwartz, 1996; Tribole & Resch, 1996).

With these expected benefits, it is not surprising that intuitive eating has gained significant popularity in the self-help literature, and that its influence is also growing within the realm of professional practice. It is not unusual to find dieticians and eating disorder counselors promoting the concepts of intuitive eating (Hirschmann & Munter, 1997; Mardis, 2002; Tribole & Resch, 1996). In this light, intuitive eating is seen as a valid philosophical orientation that can help individuals regain a normal relationship with food and achieve a healthy body size when dieting so far has been ineffective or even harmful.

Given the growing pervasiveness of intuitive eating as a self-help and professional avenue for promoting positive nutrition and healthy weight management, it is somewhat surprising that intuitive eating has not been rigorously evaluated in the professional literature (Gast & Hawks, 1998). In many cases it has been dismissed as a "new age" gimmick that lacks scientific rigor (Gast & Hawks, 2000). Until tested, however, such an assertion is as groundless as the counter-assertion that intuitive eating is a viable alternative to restrained dieting. At present, we do not know if the concept of intuitive eating actually exists in real practice, and if it does, whether it leads to the professed outcomes.

If intuitive eating is to be evaluated as a potential tool for healthy weight promotion, the immediate need is to create a measure of this orientation that is both valid and reliable. It was the purpose of this study to develop an intuitive eating scale (IES) that captures the essence of the theory as promoted in the self-help and counseling literature and to evaluate the scale for various types of validity and reliability.

METHODS

Item Development

A careful review of the professional literature was conducted to determine the existence of eating scales or other instruments that may duplicate the content of the proposed IES. The underlying constructs being measured by eating disorder inventories and scales did not seem to be closely related enough to the constructs of intuitive eating to represent duplication (Welch, Hall, & Walkey, 1988). A number of other instruments, however, measuring a variety of different eating styles, were discovered (Arnow, Kenardy, & Agras, 1995; Bond, McDowell, & Wilkinson, 2001; Hyland, Irvine, Thacker, Dann, & Dennis, 1989; Martz, Sturgis, & Gustafson, 1996; Ruderman, 1983; Smead, 1990; Smith, Williamson, Womble, Johnson, & Burke, 2000; van Strien, Frijters, Bergers, & Defares, 1986). Some of these scales seemed to measure constructs that are inherent in the philosophy of intuitive eating such as dieting attitudes and behaviors (Martz et al., 1996; Smith et al., 2000), degree of emotional eating (Arnow et al., 1995), and levels of restrained or rigorous eating (Ruderman, 1983; Smead, 1990; Stunkard & Messick, 1985). Interestingly, for some of these scales the direction of desirability is reversed in relation to intuitive eating. For example, on the Weight Loss Behavior Scale (Smith et al., 2000) avoidance of high fat and high sugar foods is considered positive; whereas such behavior (avoidance of taboo foods) would be rated negatively under the intuitive eating paradigm. After careful examination it was determined that none of the scales identified in the literature were specific to or purported to measure in a comprehensive way the theoretical constructs of intuitive eating. As such, the development of a new scale seemed warranted.

A systematic survey of the self-help and counseling literature was undertaken to identify the key elements of intuitive eating

as currently promoted to weight loss or eating disorder clients and to the public at large (Hansen & Goodman, 1999; Hirschmann & Munter, 1997; Mardis, 2002; Normandi & Roark, 1999; Podjasek & Carney, 1998; Schwartz, 1996; Tribole & Resch, 1996). Based on the findings of the review, 30 Likert-type questions were developed on a 5-point scale that ranged from *strongly agree* to *strongly disagree* (Figure 1). Each item was correlated with a theoretical construct of intuitive eating as revealed by the literature review. Identified constructs included a reliance on physical cues for the initiation and discontinuance of feeding (Hirschmann & Munter, 1988), an avoidance of emotional or external prompts for eating decisions (Tribole & Resch, 1996), an antidieting sentiment (Schwartz, 1996), and a self-care orientation that favored health and fitness over fashion or beauty (Hirschmann & Munter, 1997).

Once developed, the 30 items, along with theoretical justifications, were sent out to a panel of six experts who had experience with the theory of intuitive eating, including an eating disorder counselor, a public health educator, a healthy weight promotion professional, a lay individual who practiced intuitive eating, and an academician who conducted research and published on topics related to healthy weight management. Several recommendations led to improvements in item wording and avoidance of redundancy. After refinement, experts concurred that the final 30 item IES encompassed the basic constructs of intuitive eating in a substantial and meaningful way and that the individual items were worded in a way that conveyed the intended meaning.

The instrument was further evaluated by 56 university students enrolled in upper division health courses at a large university in the western United States. Students analyzed the intended meaning, phrasing, and likely interpretation of each item. Suggestions for clarifying or refining item wording were incorporated into the scale. Readability of the IES was assessed using Grammatik™ for WordPerfect™ and was found to be at a seventh grade reading level on the Flesch-Kincaid grade level test (WordPerfect, 1994).

Figure 1. Intuitive Eating Scale Items

1. Without really trying, I naturally select the right types and amounts of food to be healthy.
2. I generally count calories before deciding if something is OK to eat. (R)
3. One of my main reasons for exercising is to manage my weight. (R)
4. I seldom eat unless I notice that I am physically hungry.
5. I am hopeful that I will someday find a new diet that will actually work for me. (R)
6. The health and strength of my body is more important to me than how much I weigh.
7. I often turn to food when I feel sad, anxious, lonely, or stressed out. (R)
8. There are certain foods that I really like, but I try to avoid them so that I won't gain weight. (R)
9. I am often frustrated with my body size and wish that I could control it better. (R)
10. I consciously try to eat whatever kind of food I think will satisfy my hunger the best.
11. I am afraid to be around some foods because I don't want to be tempted to indulge myself. (R)
12. I am happy with my body even if it isn't very good looking.
13. I normally eat slowly and pay attention to how physically satisfying my food is.
14. I am often either on a diet or seriously considering going on a diet. (R)
15. I usually feel like a failure when I eat more than I should. (R)
16. After eating, I often realize that I am fuller than I would like to be. (R)
17. I often feel physically weak and hungry because I am dieting to control my weight. (R)
18. I often put off buying clothes, participating in fun activities, or going on vacations (hoping I can get thinner first). (R)
19. When I feel especially good or happy, I like to celebrate by eating. (R)
20. **It is important to keep track of how many fat grams I eat each day. (R)**
21. **My main goal in choosing what I eat is to take good care of my physical body.**
22. I often find myself looking for something to eat or making plans to eat—even when I am not really hungry. (R)
23. I feel pressure from those around me to control my weight or watch what I eat. (R)
24. I worry more about how fattening a food might be, rather than how nutritious it might be. (R)
25. It's hard to resist eating something good if it is around me, even if I'm not very hungry. (R)
26. On social occasions, I feel pressure to eat the way those around me are eating—even if I am not hungry. (R)
27. I honestly don't care how much I weigh, as long as I'm physically fit, healthy, and can do the things I want.
28. **I usually eat at mealtimes, even if I'm not very hungry. (R)**
29. I feel safest if I have a diet plan, or diet menu, to guide my eating. (R)
30. I mostly exercise because of how good it makes me feel physically.

Bolded items were deleted from the final scale due to low factor loadings on subscales.
(R) = reverse scored.

To reduce response set bias, some scale items were written positively, whereas others were written negatively. Negative items are reverse scored so that higher scores

reflect greater levels of intuitive eating (Figure 1).

Instrument

Demographic and lifestyle questions regarding age; race; gender; education; residence; height; weight; activity level; dieting behavior; and history of eating disorders were included in the survey instrument. To test for convergent validity, the 13-item Cognitive Behavioral Dieting Scale (CBDS) was also administered with the IES and demographic items (McDermott & Sarvela, 1999, p. 146). The CBDS has been published as a valid and reliable instrument for measuring dieting behavior (Martz et al., 1996).

Population and Sample

The sample was taken from a population of approximately 30,000 undergraduate students attending Brigham Young University (BYU) winter semester of 2002. BYU is sponsored by the Church of Jesus Christ of Latter-day Saints (LDS or Mormon). About 99% of its undergraduate students are LDS (Merrill, Salazar, & Gardner, 2001). About half of the undergraduate students elect to satisfy the school's health and physical education requirement by taking a two-credit hour class titled Health Education and Physical Education (HEPE). The alternative is to take an on-line version of the on-campus semester-long course or four physical activity courses. We do not believe that there were any differences with respect to intuitive eating between the students who decided to take the on-campus course and those who did not. Hence, to get a representative group of all undergraduate students, we sampled all students attending the HEPE class. Requesting that all students attending the class complete the questionnaire minimized the potential for selection bias. Students were informed that their responses were anonymous, that participation was strictly voluntary, and that the decision to not participate would not reflect on their class grade. The study was approved by the institutional review board at BYU prior to initiation.

Students attending the HEPE class were also administered the IES 4 weeks later to assess test–retest reliability. The last four digits of student social security numbers were recorded during each administration to link responses. Except for assessing the reliability of the instrument, the results in this paper focus on responses from the initial administration of the questionnaire. Topics covered during the 4 week test–retest interval included first-aid, personal safety, reproductive health, and consumer health. It was felt that these topics were sufficiently distant from the eating behaviors under investigation so as not to contaminate test–retest results.

Table 1. Factor Loadings, Cronbach's Alpha Coefficients, and Test/Retest Correlation Coefficients According to Intuitive Eating Subscales

Subscale	Factor Loadings		Cronbach's Alpha Coefficient		Test-Retest Correlation
Question Number	Test	Retest	Test	Retest	Coefficient
Intrinsic eating			.420	.408	.560
1	.572	.497			
4	.577	.690			
10	.628	.565			
1	.640	.634			
Extrinsic eating			.792	.774	.708
7	.726	.684			
16	.627	.587			
19	.628	.625			
22	.725	.687			
25	.762	.788			
26	.733	.736			
Antidieting			.928	.920	.866
2	.670	.571			
3	.712	.736			
5	.771	.630			
8	.755	.786			
9	.775	.766			
11	.771	.748			
14	.826	.792			
15	.832	.836			
17	.670	.672			
18	.739	.717			
23	.703	.747			
24	.735	.689			
29	.685	.675			
Self-care			.589	.646	.672
6	.795	.775			
12	.606	.657			
27	.740	.740			
30	.541	.624			
Total					.845

Note: Items that did not provide sufficient factor loadings on any of the subscales were dropped. These included items 20, 21, and 28.

Data Collection

At initial administration 391 students responded to the questionnaire, representing a 97% response rate of all students attending the class that day. Four weeks later, there was a 95% response rate of all students attending the class, with 285 students successfully linked. All data were collected using paper and pencil surveys and then hand

Table 2. Level of Agreement for Intuitive Eating Subscale Items

Subscale	Mean	Standard Deviation	Median	Range of Scores	Sample Size
Men					
Intrinsic eating	15.55	2.83	16.00	7–20	220
Extrinsic eating	21.84	4.45	22.00	11–30	220
Antidieting	59.39	5.95	61.00	36–65	219
Self-care	10.64	2.57	11.00	5–19	218
Total	107.34	9.91	109.00	73–126	214
Women					
Intrinsic eating	12.98	3.30	13.00	5–20	158
Extrinsic eating	18.75	5.44	19.00	6–30	157
Antidieting	47.48	11.49	49.00	17–65	153
Self-care	11.04	2.40	11.00	5–16	157
Total	90.25	18.03	92.00	43–127	150

entered into computer files. Each file was rechecked for accuracy after entry.

In terms of sample size, 10 participants are recommended per item in factor analysis. The sample size of 391 used in this study exceeds the minimum number of 300 recommended participants for a 30-item scale (Gorsuch, 1983).

Statistics

Data were analyzed using the Statistical Analysis System (SAS) software for personal computers, release 8.2 (SAS, 2001). Conventional cross-tabulations, factor analysis, and logistic regression techniques appropriate for assessing the ordinal response variables were used. Tests of significance were based on the 0.05 level against the two-sided null hypothesis of no association.

RESULTS

Demographics

Of the 391 participants in the study, 58.4% were men and 41.6% were women; 87.7% were Caucasian, 6.9% were Hispanic, and 5.4% represented other racial groups; 15.9% resided in rural areas, 63.2% resided in suburban areas, and 20.9% resided in urban areas; 57.0% were freshman, 25.8% were sophomores, 12.3% were juniors, and 4.9% were seniors. Mean age for the entire sample was 20.6 years (SD=3.4). The mean age was 21.1 for men (SD=2.7), and 19.9 for women (SD=4.2). The older age for men reflects service on 2-year missions for LDS, where age 19 is the typical age when missionary service may begin.

Factor Analysis

Factor analysis was used to describe covariance relations among the variables in terms of underlying, but unobservable, random quantities called factors. All items were subjected to a principal components analysis with varimax rotation. An orthogonal rotation was used because there was very little between-factor correlation with oblique rotation. Four factors were retained with eigenvalues greater than 1: 9.18, 2.24, 1.72, and 1.32 accounting for 55.4% of total variance. The derived factor solution largely replicated the theoretical constructs that formed the basis for initial item development, including intrinsic eating, extrinsic eating, antidieting, and self-care. As shown in Table 1, alpha coefficients for factor groupings remained consistent for retest surveys. Three of the 30 items investigating intuitive eating were dropped because they had low factor loadings on any of the four factors identified (less than .4) The level of agreement for the remaining 27-item statements, grouped under the subscales identified by the factor analysis, is shown in Table 1.

Mean and standard deviations along with median and range values for each of the four subscales are shown by gender in Table 2. Each item has a possible score of from 1 to 5. The minimum score possible for a given subscale can be calculated by multiplying the number of items in the subscale by the number 1 (lowest score), whereas the maximum score would be the number of items multiplied by 5 (maximum score). For most scales the range of actual scores corresponded closely with the range of possible scores. Mean and median scores were close to the center of the score distribution for intrinsic and extrinsic eating subscales, but closer to the upper end for antidieting and self-care subscales. Mean scores that are consistently at the high end of the possible distribution may suggest a possible ceiling effect, especially for male respondents on the antidieting subscale. Different sample sizes for each subscale reflect missing data for some responses.

Convergent Validity

As a measure of convergent validity, the CBDS was administered with the IES. The CBDS is a 13-item, single-factor scale in which higher scores represent increasing levels of involvement with restrictive dieting practices (Martz et al., 1996). Similarly, all IES subscales are scored such that a high score represents agreement with intuitive eating principles and practices. It was assumed that the intrinsic eating subscale of the IES, a measure of internal motivation for eating based on responsiveness to hunger and physical prompts, would correlate negatively with the CBDS. It was further assumed that the extrinsic eating subscale, a high score indicating a lack of external influences on eating decisions, and the antidieting subscale, a high score indicating disagreement with dieting practices and behaviors, would also correlate negatively with the CBDS. Finally, we assumed that the self-care subscale, a high score

indicating a preference for health and fitness over attractiveness, would correlate negatively with the CBDS.

Pearson correlation coefficients between the total score for the CBDS and total scores for each of the four factors were r=–.836 (p<.0001) for intrinsic eating, r=–.418 (p<.0001) for extrinsic eating, r=–.484 (p<.0001) for antidieting, and r=–.023 (p = .659) for self-care. All relationships were moderate to very strong, statistically significant, and in the predicted direction except for self-care.

Test–Retest Reliability

Based on 285 linked subjects, Pearson correlation coefficients between baseline and retest were r=.560 (p<.0001) for intrinsic eating, r=.708 (p<.0001) for extrinsic eating, r=.866 (p<.0001) for antidieting, and r=.672 (p<.0001) for self-care. For all factors combined the Pearson correlation coefficient between baseline and retest was r=.845 (p<.0001). The 4-week lapse between initial testing and subsequent retesting was somewhat longer in this study than that used for reliability evaluations on other eating style scales where the test–retest period typically has been anywhere from 2 days (Martz et al., 1996) to 2 weeks (Arnow et al., 1995; Smith et al., 2000). Even with a longer than usual test–retest period, three of the four subscales either exceeded or approximated the .7 range that is typically considered adequate for establishing reliability (McDowell & Newell, 1996), whereas the intrinsic eating subscale fell somewhat below that level. The high test–retest correlation for the total scale provides support for intuitive eating as a relatively stable trait over a 1-month period. Other studies have found that eating styles such as "dietary restraint" are also relatively stable over long periods of time (Drapeau et al., 2003).

Concurrent Validity

Demographic and lifestyle data were collected to evaluate the ability of the IES to discriminate between groups in predictable ways. Mean level of agreements with statements about intuitive eating are presented for the selected subscales according to demographic and lifestyle variables in Table 3.

Previous research suggests that eating styles differ for men and women, with women being more prone to eating disorders and restrictive dieting (French, Jeffery, & Wing, 1994; Hsu, 1989). It was predicted therefore that IES scores would be higher for men than women. As expected, men had a significantly higher mean level of agreement than did women for each of the subscales, except self-care, and for the total scale.

Given the relatively limited age range of participants, IES scores were not expected to differ for age or education level. Unexpectedly, extrinsic eating, antidieting, and total IES scores were lower for the age group 19–22 compared with younger and older ages, suggesting that this age range may be particularly susceptible to restrictive dieting and external feeding practices. IES subscales did not discriminate between education levels.

There was no reason to expect racial/ethnic differences in IES scores. Hispanics, however, compared with Caucasians and other racial/ethnic groups tended to have the lowest level of agreement, significantly so for intrinsic feeding, antidieting, and total IES scores.

As expected, scores on the antidieting subscale and total IES scale were significantly higher for those without an eating disorder compared with those with or unsure whether they had an eating disorder. The same trends held for other subscales, except self-care, although degree of differences failed to achieve significance.

As predicted, subscale and total scores were highest for those who reported the lowest levels of dieting. Level of agreement with each of the subscales except self-care, and level of agreement with the total scale, decreased with increasing frequency of dieting to lose weight.

An underlying assumption of intuitive eating is that intuitive eaters are more likely to be normal weight compared with nonintuitive eaters. In this study, body mass index, based on self-report height and weight, was used to discriminate between normal, overweight, or obese participants using internationally accepted definitions of overweight and obesity (25 kg/m^2 and 30 kg/m^2, respectively; World Health Organization, 1995). Contrary to expectation, level of agreement with intrinsic eating was significantly higher for obese individuals. Conversely, level of agreement with antidieting was in the predicted direction with significantly higher scores for individuals of normal weight. As expected, normal weight subjects scored significantly higher on the total IES scale than overweight or obese participants.

Although the philosophy of intuitive eating promotes a health and fitness orientation as opposed to a focus on thinness and attractiveness, it does not focus on physical activity specifically. It was accordingly difficult to predict a relation between IES and activity levels. In this study none of the IES subscales were significantly associated with activity levels. Likewise, there was no expected relation between IES subscales and area of residence, and none was found.

DISCUSSION

At any given time, approximately 38% of adult women and 24% of adult men in the United States may be dieting to lose weight, with the most common strategies being restriction of calories and calorie counting (Serdula et al., 1994). Even so, the levels of obesity in the United States are rising sharply (Mokdad et al., 1999; Mokdad et al., 2000), and negative weight-related behaviors continue to be a growing problem (Neumark-Sztainer & Hannan, 2000). Given the high level of self-help and practice-based support for intuitive eating as an alternative to restrictive dieting, it is incumbent on health promotion professionals to evaluate the suitability of intuitive eating as a potential tool for advancing healthy weight management (Gast & Hawks, 2000). Toward that end, the current study focused on the development and evaluation of an intuitive eating scale that attempts to define, delimit, and operationalize the construct of intuitive eating.

Scale development began with a clearly

Table 3. Mean Level of Agreement with Intuitive Eating Subscales According to Select Demographic and Lifestyle Variables

Variable	No.	Intrinsic Eating	Extrinsic Eating	Antidieting	Self-Care	Total
Gender						
Men	227	3.89	3.64	4.58	2.66	3.98
Women	162	3.26	3.09	3.63	2.76	3.33
T-statistic *P* value		<.0001	<.0001	<.0001	.1370	<.0001
Wilcoxon *P* value		<.0001	<.0001	<.0001	.0684	<.0001
Age						
<19	98	3.66	3.50	4.14	2.73	3.72
19–22	184	3.56	3.24	4.04	2.71	3.60
>22	107	3.74	3.67	4.50	2.67	3.92
F-statistic *P* value		.2401	.0003	<.0001	.8094	<.0001
Kruskal-Wallis *P* value		.1840	.0025	<.0001	.7455	.0006
Race/Ethnicity						
Caucasian	343	3.67	3.42	4.23	2.69	3.74
Hispanic	27	3.16	3.18	3.53	2.76	3.26
Other	21	3.62	3.76	4.50	2.81	4.00
F-statistic *P* value		.0115	.1186	<.0001	.6861	.0003
Kruskal-Wallis *P* value		.0049	.2901	.0123	.8864	.0127
Area of Residence						
Rural	60	3.69	3.35	4.25	2.60	3.71
Suburban	239	3.64	3.43	4.20	2.76	3.74
Urban	79	3.57	3.46	4.15	2.60	3.68
F-statistic *P* value		.7009	.7635	.7679	.0780	.7832
Kruskal-Wallis *P* value		.5181	.8035	.6779	.1806	.9314
Education						
Freshman	223	3.62	3.39	4.11	2.70	3.67
Sophomore	101	3.55	3.40	4.29	2.76	3.76
Junior	48	3.67	3.58	4.34	2.62	3.83
Senior	19	3.70	3.47	4.31	2.70	3.79
F-statistic *P* value		.7716	.7416	.1522	.8791	.3417
Kruskal-Wallis *P* value		.6664	.6921	.2360	.8445	.2360

defined content domain that included four distinct theoretical constructs. Evaluation of individual items for content, theoretical fit, and readability by a panel of experts, and subsequently by representatives of the target population, helped to ensure face and content validity (Beck & Gable, 2001; Bernard, 2000).

Arriving at a final factor solution that closely approximated the four theoretical constructs that were used to develop scale items further supports the construct validity of the scale. As measured by alpha coefficients, factors remained stable over the 4-week test–retest period.

Convergent validity was assessed by comparing scores on the CBDS against IES subscales. With the exception of the self-care subscale, the other IES subscales correlated with the CBDS in the predicted direction. Correlations were moderate to very strong and statistically significant.

Concurrent validity was measured by evaluating the ability of the IES to discriminate between groups in expected ways. As predicted, women, those with current or past eating disorders, frequent dieters, and the overweight and obese generally scored lower on IES subscales and the total IES. The one notable exception was higher scores for the obese on the intrinsic eating subscale. This was unexpected and is difficult to explain.

Variable	No.	Intrinsic Eating	Extrinsic Eating	Antidieting	Self-Care	Total
Do you feel you may currently have an eating disorder?[A]						
Yes	22	3.36	3.03	3.38	2.79	3.21
No	347	3.48	3.46	4.12	2.77	3.68
Unsure	21	3.24	3.37	3.68	2.63	3.39
F-statistic *P* value		.3555	.0791	<.0001	.6284	<.0001
Kruskal-Wallis *P* value		.0037	.0529	<.0001	.5245	<.0001
How often do you diet per year to lose weight?[†]						
<1	301	3.58	3.58	4.28	2.81	3.81
1–2	32	3.25	3.40	3.74	2.55	3.41
>2	50	3.02	2.83	3.10	2.66	2.96
F-statistic *P* value		<.0001	<.0001	<.0001	.0917	<.0001
Kruskal-Wallis *P* value		<.0001	<.0001	<.0001	.3118	<.0001
How many times do you vigorously exercise per week?[†]						
<2.5	63	3.29	3.40	4.09	2.66	3.62
2.5–<4.5	214	3.53	3.38	4.05	2.79	3.63
4.5+	112	3.45	3.55	3.91	2.79	3.59
F-statistic *P* value		.1159	.2471	.1583	.4044	.8372
Kruskal-Wallis *P* value		.1617	.2003	.5407	.1653	.9564
Body mass index[†]						
Normal	307	3.54	3.46	4.13	2.78	3.69
Overweight	59	3.24	3.23	3.75	2.79	3.42
Obese	20	3.97	3.33	3.57	2.50	3.27
F-statistic *P* value		.0006	.1374	<.0001	.1971	<.0001
Kruskal-Wallis *P* value		.0147	.7172	.0027	.2361	.0170

Note: Possible range for mean values is 1–5 for each subscale.
[A]Means adjusted for gender, age, and race. F-statistic *P* values adjusted for gender, age, and race. The Kruskal-Wallis test is not adjusted for gender, age, and race.

The relationship between the IES and other study variables was less predictable. In general, no association was found for the IES and year in school, area of residence, or activity level. Unexpectedly, it was found that Hispanic participants and those between the ages of 19–22 tended to score lower on some subscales and on the total IES. Again, future research will be necessary to better understand these findings.

A limitation of the current study was the use of a single, somewhat unique, university population to evaluate the validity and reliability of the IES. Participants were mostly Caucasian, middle-class, relatively healthy, and normal weight. Although the sample used in this study was probably representative of undergraduate students at Brigham Young University, the results may not be generalizable to other university or community settings. Future research will be required before the IES can be considered valid or reliable among other populations.

Another limitation was the self-report nature of several critical variables including physical activity levels, dieting involvement, experience with eating disorders, and personal height and weight. Although direct measures may have decreased the potential for bias on some of these variables, there is research support for the validity of such self-report variables as height and weight (Jeffery, 1996).

The IES, as developed in the present study, shows promise as a valid and reliable instrument. Shortcomings of the scale include a relatively low alpha coefficient and test–retest coefficient for items in the intrinsic eating factor (.42), and a self-care subscale that did not share the predictive properties of other subscales. For example, the self-care subscale failed to discriminate on any demographic or lifestyle variable used in the study. Nor did the self-care subscale relate to the CBDS in expected ways. Future research may indicate that the self-care subscale is less useful than other scales in measuring intuitive eating.

This study lends modest support for intuitive eating as a real and measurable construct. The IES provides a possible measure for this orientation and opens the door for further investigation. If ongoing research continues to support the validity and reliability of the IES in various populations, future research might attempt to use the IES to differentiate between the diet composition, blood lipid profiles, body composition, and cholesterol levels of high and low scorers. Do intuitive eaters really have better diets, healthier weights, and more positive health indicators than nonintuitive eaters? Secondly, it would be useful to test the ability of interventions to increase intuitive eating levels. If IES scores can be increased, do relevant health variables improve in tandem?

CONCLUSION

The practice of intuitive eating is offered in the self-help and counseling literature as a positive alternative to restrained dieting. To date, very little research has attempted to evaluate the reality or usefulness of intuitive eating. This study developed an intuitive eating scale in an attempt to define and operationalize the theory of intuitive eating. The development of relatively cohesive, stable factors that mirror the theoretical constructs of intuitive eating lends support for the existence and measurability of this construct. Measures of convergent and concurrent validity further argue in favor of the IES as a potentially useful instrument. Findings also provide limited support for the underlying assumptions of intuitive eating, namely that intuitive eating is negatively related to body mass index, eating disordered behavior, and restrictive dieting. Although weaknesses of the IES as developed in this study include low alpha and test–retest coefficients for the intrinsic eating subscale and a self-care subscale that had weaker validity indicators, the scale nevertheless shows some promise as a useful measure of intuitive eating that might be refined through further research.

REFERENCES

Arnow, B., Kenardy, J., & Agras, W. (1995). The Emotional Eating Scale: The development of a measure to assess coping with negative affect by eating. *International Journal of Eating Disorders, 18*, 79-90.

Beck, C., & Gable, R. (2001). Ensuring content validity: An illustration of the process. *Journal of Nursing Measurement, 9*, 201-215.

Bernard, R. H. (2000). *Social research methods: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage Publications.

Bond, M., McDowell, A., & Wilkinson, J. (2001). The measurement of dietary restraint, disinhibition and hunger: An examination of the factor structure of the Three Factor Eating Questionnaire (TFEQ). *International Journal of Obesity and Related Metabolic Disorders, 25*, 900-906.

Drapeau, V., Provencher, V., Lemieux, S., Despres, J. P., Bouchard, C., & Tremblay, A. (2003). Do 6-y changes in eating behaviors predict changes in body weight? Results from the Quebec Family Study. *International Journal of Obesity Related Metabolic Disorders, 27*, 808-814.

French, S., Jeffery, R., & Wing, R. (1994). Sex differences among participants in a weight-control program. *Addictive Behaviors, 19*, 147-158.

Gast, J. A., & Hawks, S. R. (1998). Weight loss education: The challenge of a new paradigm. *Health Education and Behavior, 25*, 464-473.

Gast, J. A., & Hawks, S. R. (2000). Examining intuitive eating as a weight loss program. *Healthy Weight Journal, 14*, 42-44.

Gorsuch, R. (1983). *Factor analysis*. Hillsdale, NJ: Erlbaum.

Hansen, V., & Goodman, S. (1999). *The seven secrets of slim people*. New York: HarperCollins.

Hawks, S. R., & Gast, J. A. (1998). Weight loss education: A path lit darkly. *Health Education and Behavior, 25*, 371-382.

Hawks, S. R., & Gast, J. A. (2000). The ethics of promoting weight loss. *Healthy Weight Journal, 14*, 25-26.

Hirschmann, J. R., & Munter, C. H. (1989). *Overcoming overeating*. New York: Fawcett Columbine.

Hirschmann, J. R., & Munter, C. H. (1997). *When women stop hating their bodies: Freeing yourself from food and weight obsession*. New York: Fawcett Book Group.

Hsu, G. (1989). The gender gap in eating disorders: Why are the eating disorders more common among women? *Clinical Psychology Review, 9*, 393-407.

Hyland, M., Irvine, S., Thacker, C., Dann, P., & Dennis, I. (1989). Psychometric analysis of the Stunkard-Messick Eating Questionnaire (SMEQ) and comparison with the Ducth Eating Behavior Questionnaire (DEBQ). *Current Psychology: Research and Reviews, 8*, 228-233.

Jeffery, R. (1996). Bias in reported body weight as a function of education, occupation, health and weight concern. *Addictive Behaviors, 21*, 217-222.

Mardis, R. (2002). *Intuitive eating: Reclaiming how to eat for life. Orem, UT: Center for Change*. [Online] Retrieved from http://centerforchange.com/articles/detail.php?i=37. Orem, UT: Center for Change [Producer and Distributor].

Martz, D., Sturgis, E., & Gustafson, S. (1996). Development and preliminary validation of the cognitive behavioral dieting scale. *International Journal of Eating Disorders, 19*, 297-309.

McDermott, R. J., & Sarvela, P. D. (1999). *Health education evaluation and measurement: A practitioner's perspective* (2nd ed.). Madison, WI: WCB/McGraw-Hill.

McDowell, I., & Newell, C. (1996). *Measuring health: A guide to rating scales and questionnaires* (2nd ed.). New York: Oxford University Press.

Merrill, R. M., Salazar, R. D., & Gardner, N. W. (2001). Relationship between family religiosity and drug use behavior among youth. *Social Behavior and Personality, 29*, 347-358.

Mokdad, A. H., Serdula, M. K., Dietz, W. H.,

Bowman, B. A., Marks, J. S., & Koplan, J. P. (1999). The spread of the obesity epidemic in the United States, 1991-1998. *Journal of the American Medical Association, 282*, 1519-1522.

Mokdad, A. H., Serdule, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (2000). The continuing epidemic of obesity in the United States. *Journal of the American Medical Association, 284*, 1650-1651.

Neumark-Sztainer, D., & Hannan, P. (2000). Weight-related behaviors among adolescent girls and boys: Results from a national survey. *Archives of Pediatric and Adolescent Medicine, 154*, 569-577.

Normandi, C. E., & Roark, L. (1999). *It's not about food: Change your mind; change your life; end your obsession with food and weight*. New York: Penguin.

Podjasek, J. H., & Carney, J. (1998). *The ten habits of naturally slim people: And how to make them part of your life*. New York: McGraw-Hill.

Ruderman, A. (1983). The restraint scale: a psychometric investigation. *Behavior Research and Therapy, 21*, 253-258.

SAS (2001). The SAS system for Windows, proprietary software release 8.2. Cary, NC: SAS Institute.

Schwartz, B. (1996). *Diets don't work*. New York: Breakthru Publishers.

Serdula, M., Williamson, D., Anda, R., Levy, A., Heaton, A., & Byers, T. (1994). Weight control practices in adults: Results of a multistate telephone survey. *American Journal of Public Health, 84*, 1821-1824.

Smead, V. (1990). A psychometric investigation of the Rigorous Eating Scale. *Psychological Reports, 67*, 555-561.

Smith, C., Williamson, D., Womble, L., Johnson, J., & Burke, L. (2000). Psychometric development of a multidimensional measure of weight-related attitudes and behaviors. *Eating and Weight Disorders, 5*, 73-86.

Stunkard, A., & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research, 29*, 71-83.

Tribole, E., & Resch, E. (1996). *Intuitive eating: A recovery book for the chronic dieter*. New York: St. Martin's Press.

van Strien, T., Frijters, J., Bergers, G., & Defares, P. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *Journal of Eating Disorders, 5*, 295-315.

Welch, G., Hall, A., & Walkey, F. (1988). The factor structure of the eating disorders inventory. *Journal of Clinical Psychology, 44*, 51-56.

WordPerfect. (1994). Grammatik, version 9. San Francisco: Reference Software International.

World Health Organization. (1995). *Physical status: The use and interpretation of anthropometry*. Geneva: Author.