ABAC ODI JOURNAL Vision. Action. Outcome

ISSN: 2351-0617 (print), ISSN: 2408-2058 (electronic)

Reliability and Validity of the Adapted Thai Intuitive Eating Scale-2 (IES-2) in Emerging Adult Women

Onraya Himakorn, Rajitha Menon

ABAC ODI JOURNAL Vision. Action. Outcome Vol 12(1) pp. 287-304

http://www.assumptionjournal.au.edu/index.php/odijournal

Published by the
Organization Development Institute
Graduate School of Business and Advanced Technology Management
Assumption University Thailand

ABAC ODI JOURNAL Vision. Action. Outcome
is indexed by the Thai Citation Index and ASEAN Citation Index

Reliability and Validity of the Adapted Thai Intuitive Eating Scale-2 (IES-2) in Emerging Adult Women

Onraya Himakorn[1], Rajitha Menon[2]

[1]Corresponding Author, Doctoral student, Department of Psychology, Graduate School of Human Sciences, Assumption University, Thailand. Email: o.himakorn@gmail.com
[2]Assistant Professor, Department of Psychology, Graduate School of Human Sciences, Assumption University, Thailand. Email: rarikkatt@au.edu

Received: 11 April 2024. Revised: 31 May 2024. Accepted: 11 June 2024

Abstract

Intuitive eating (IE) is a hunger-based eating style where individuals eat according to hunger cues and satiety cues of their bodies, which is associated with psychological and physical well-being. As opposed to intuitive eating, maladaptive eating issues are a common problem found among the female emerging adult population as their risk of experiencing self-objectification and negative body image is at its peak. In this study, the Intuitive Eating Scale-2 (IES-2) was translated into Thai language and was evaluated for its psychometric properties with data collected from 529 Thai female emerging adults living in Bangkok, Thailand. Factor analyses reported and confirmed a 4-factor model. The internal consistency of the scale was excellent ($\alpha = .95$). The findings contribute to the literature by providing a psychometrically sound scale to measure the level of intuitive eating that an individual has, which can be used to promote healthy eating by health professionals.

Keywords: Intuitive Eating, Scale Adaptation, Assessment, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA)

Introduction

Among the types of healthy eating styles, intuitive eating (IE), a hunger-based eating style, has recently been receiving a lot of research attention in the recent years due to its promising benefits associated with both psychological and physical well-being. Intuitive eating has become an area of interest among numerous fields of study, extending from psychology to the nutrition, fitness, and weight management industry.

With the increased research attention, IE was found to be positively associated with a wide range of adaptive psychological and physical health indicators. These adaptive psychological correlations ranged from better interoceptive sensitivity, self-compassion, positive body image, body acceptance, body appreciation, body satisfaction, optimism, and positive mood, to life satisfaction (Linardon et al., 2021; Schaefer & Magnuson, 2014; Van Dyke & Drinkwater, 2014; Warren et al., 2017). As for physical health, IE was positively correlated to metabolic fitness and high-density lipoprotein or good cholesterol and was negatively correlated to food anxieties, attachment anxiety, eating disorders, symptomatology and disinhibited eating, BMI, maladaptive weight control behaviors, psychological distress, frequency of food binging behavior, as well as triglyceride levels and cardiovascular risk (Hawks et al., 2005; Madden et al., 2012).

There are three measurement instruments available for assessing intuitive eating, two

of which are called the intuitive eating scale (IES; Hawk et al., 2004; Tylka, 2006). The revised and most recent version is called the Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013).

The original 27-item IES (Hawk et al., 2004) consists of 4 subscales including intrinsic eating (e.g., "Without really trying, I naturally select the right types and amounts of food to be healthy."), extrinsic eating (e.g., "On social occasions, I feel pressure to eat the way those around me are eating—even if I am not hungry."; reverse-scored), antidieting (e.g., "I worry more about how fattening a food might be, rather than how nutritious it might be."; reverse-scored, and self-care (e.g., "I honestly don't care how much I weigh, as long as I'm physically fit, healthy, and can do the things I want.").

The second IES was developed in 2006 by Tylka. Rather than revising the previous existing instrument, Tylka developed a new scale in response to the increasing research attention on adaptive eating behaviors, which does not mirror symptoms of pathological eating disorder (Tylka, 2006). Tylka developed a 21-item scale consisting of three subscales including unconditional permission to eat (e.g., "I follow eating rules or dieting plans that dictate what, when, and/or how much to eat."; reverse-scored), eating for physical rather than emotional reasons (e.g., "I find myself eating when I am lonely, even when I'm not physically hungry."; reverse-scored), and reliance on internal hunger/satiety cues (e.g., "I trust my body to tell me how much to eat.").

Tylka and Kroon Van Diest (2013) then revised the IES (Tylka, 2006) and developed an improved version of the IES, that is the 23-item IES-2. The IES-2 contained 11 original items from the IES (Tylka, 2006) and 12 new items. IES-2 has an additional subscale of Body–Food Choice Congruence which assesses the extent to which individuals match their food choices with their bodies' needs. While the items in the IES (Tylka, 2006) are predominantly negatively scored, the items in the revised IES-2 are more positively scored. IES-2 consists of 4 subscales which include the Unconditional Permission to Eat Subscale (e.g., "I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat."), the Eating for Physical Rather Than Emotional Reasons Subscale (e.g., "I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry."; reverse-scored), the Reliance on Hunger and Satiety Cues Subscale (e.g., "I rely on my fullness (satiety) signals to tell me when to stop eating.") and the Body–Food Choice Congruence Subscale (e.g., "I mostly eat foods that make my body perform efficiently (well)".

Moreover, IES-2 was translated and cross-culturally adapted into many cultures. These include, but are not limited to, Chinese Mandarin, French, German, Hungarian, Italian, Japanese, Malay, Persian, Portuguese, and Turkish (Akırmak et al., 2018; Bas et al., 2017; Carbonneau et al., 2016; Da Silva et al., 2020; Junhua et al., 2021; Namatame & Sawamiya, 2019; Nejati et al., 2020; Román et al., 2021; Ruzanska & Warschburger, 2017; Swami, Maïano, et al., 2021; Swami, Todd, et al., 2020). All of which have demonstrated good psychometric properties and cross-cultural adaptability.

Given the numerous cross-cultural adaptations of the IES-2, it would be worthwhile to adapt the scale and make it available for use among the Thai language-speaking population. To the researcher's knowledge, the Thai version of the IES-2 is still currently unavailable. Hence, this study aimed to translate the IES-2 into the Thai language and evaluate its psychometric properties. With this Thai version of the IES-2, future research can be conducted on interventions aimed at promoting IE or adaptive eating behavior, among the Thai-speaking population. This research focuses on the adaptive eating style, or a compassionate, sustainable, and body-positive alternative to traditional dieting, which can help promote a better quality of life in the context of holistic health and well-being.

Literature Review

Traditionally, when it comes to the topic of healthy eating patterns, the bulk majority of past research has directed its attention towards the widely known rigid dietary controlled eating, also known as the restrictive eating or all-or-none eating approach such as actively avoiding and refusing desired "unhealthy foods", and the flexible dietary controlled eating which involves behaviors such as eating smaller portion, choosing "healthy foods" or making compensation in the following meals when "unhealthy foods" were eaten (Linardon & Mitchell, 2017; Tylka et al., 2015). However, consistent evidence has now concluded that rigid dietary control is a maladaptive eating pattern as it has been found to predict binge eating, higher body mass index (Hauck et al., 2020), and higher distress (Tylka et al., 2015). Several longitudinal studies reported that eating restraint does not lead to long-term weight reduction but instead has caused weight increase (Jacquet et al., 2020). While flexible dietary control has been known to be the healthier alternative approach to eating, such recommendations may be misguided, given that rigid control and flexible control approach both share a substantially overlapping and entangled element of dependency on external cues for eating (Linardon & Mitchell, 2017; Tylka et al., 2015). Furthermore, flexible dietary control was also found to be associated with impaired working memory and disinhibited eating (Westenhoefer et al., 2013). Researchers have therefore gathered their effort into the hunt for a more viable eating pattern and have recognized the potential of IE (Linardon & Mitchell, 2017; Linardon et al., 2021; Tylka et al., 2015).

In 1995, to help individuals to break free from the diet mentality, two U.S. dietitians, Tribole and Resch developed intuitive eating. As opposed to intuitive eating, diet mentality is where individuals eat based on external cues and non-physiological factors, such as eating based on emotions, social settings, feelings of not wanting to waste food, a set calorie goal or serving size (Tribole & Resch, 1995). Diet mentality is believed to be the reason why individuals are overweight and obese (Gast & Hawks, 1998). When intuitive eating was first invented, there are 10 principles of intuitive eating: 1) reject the diet mentality; 2) honour your hunger; 3) make peace with food; 4) challenge the food police; 5) feel your fullness; 6) discover the satisfaction factor; 7) cope with your emotions without using food; 8) respect your body; 9) exercise – feel the difference; 10) honour your health – gentle nutrition (Tribole & Resch, 1995).

As of to date, scholars have clustered these principles and have concluded that there are 4 main principles to IE including (1) unconditional permission to eat, (2) eating for physical rather than emotional reasons, (3) the reliance on hunger and satiety cues and (4) the body–food choice congruence.

Unconditional permission to eat is when individuals allow themselves to eat any food that they desire at that moment (Tribole & Resch, 1995). It reflects the readiness and willingness to eat when hungry and no certain food is to be categorized as bad or unacceptable (Tylka, 2006; Tylka & Kroon Van Diest, 2013). Individuals who eat intuitively do not ignore their internal hunger signals and do not avoid food that is categorized as bad or unacceptable (Tylka, 2006). Past studies have found that those who give themselves unconditional permission to eat are less likely to binge eat and are unlikely to feel guilty when eating (Polivy & Herman, 1999; Woody et al., 1981), as well as feel more controlled when eating (Tylka, 2006).

Eating for physical rather than emotional reasons reflects when individuals eat in response to their internal physiological hunger signals and do not engage in eating as a way to cope with their emotional fluctuations or distress such as boredom, anxiety, stress and

loneliness (Tylka & Kroon Van Diest, 2013). As a matter of fact, individuals who set themselves a diet boundary or restriction are more likely to engage in binge eating and experience negative emotions when the diet boundary is breached (Costanzo et al., 2001; Tylka & Wilcox, 2006).

Reliance on internal hunger and satiety cues reflects when individuals are aware of and trust in their internal hunger and satiety signals to guide their eating behavior (Carper et al., 2000; Tylka & Kroon Van Diest, 2013). An experimental study of young children has shown that this internal mechanism helps regulate accurate daily food intake is innate and inborn for everyone (Birch et al., 1991). They found that although the food intake that the children had at each meal was highly volatile, the total food intake each day was consistent. For example, when children had a high-calorie meal, the following meal was one that was low in calories. It was discussed that because the amount of food that the children intuitively eat at each meal is highly variable, many caregivers often conclude that their children are unable to appropriately regulate their food intake and begin to coercively prescribe their children rules regarding what, when and how much to eat. As a result, children will begin to lose their internal ability to regulate food intake and substitute it with external rules (Tylka, 2006). This supports the finding in a meta-analysis which reports that individuals learn to rely on external cues over time as they grow up (Vartanian, 2015). Not only that this will increases the likelihood of experiencing weight gain, emotional eating and binge eating (Birch & Fisher, 2000; Birch et al., 2003), especially for young girls, (Carper et al., 2000), but as children grow up and become more exposed to social media they are also at high risk of internalising the societal messages on restrictive dieting and become even more disconnected with their innate ability to accurately regulate food intake as an adult (Tylka, 2006).

Body-food choice congruence is the extent to which food choices of individuals are a match to what their bodies need (Tylka & Kroon Van Diest, 2013). It reflects when individuals make food choices that provide nutritional value and energy for body functions and performances, which also taste good, as a way to honour and promote their health and their bodily functions (Tylka & Kroon Van Diest, 2013). For example, individuals whose body and food choices are congruent would consider how the food makes their body feels, whether the food will offer them lasting energy, and how they would feel after they consume it (Tylka & Kroon Van Diest, 2013). It is important to note that body functionality consists of everything that the body can do or is capable of doing, which does not reflect an able-bodied construct and does not equate to the normative or idealized notions of physical appearance, characteristics, or fitness (Alleva & Tylka, 2021). It also includes body functions related to senses and sensations such as experiencing pleasure from the smell or the taste of food, as well as body functions related to relationships and communication with others such as the desirable experience of sharing meals with family and friends (Alleva et al., 2015).

At the moment in time, the most recent and well-studied instrument for measuring IE is the IES-2 which consists of 4 subscales reflecting the 4 main principles of IE including unconditional permission to eat, eating for physical rather than emotional reasons, reliance on internal hunger/satiety cues, and the body–food choice congruence. Based on the IES-2, IE was defined as the adaptive eating style where individuals unconditionally allow themselves to eat whatever and whenever they wish, so long as it is eaten following the satiety and the hunger cues of their bodies and that the food choices made are of benefit to their body functionality (Tylka & Kroon Van Diest, 2013).

Tylka and Kroon Van Diest (2013) have stated that researchers can confidently use the IES-2 as a measure of intuitive eating as IES-2 is reliable and valid, as demonstrated by the evident internal consistency, test-retest reliability (over a 3-week period), construct validity,

convergent validity, discriminant validity and incremental validity. For women, the full scale of IES-2 has Cronbach's alpha of .87, the unconditional permission to eat subscale has Cronbach's alpha of .81, the eating for physical rather than emotional reasons subscale has Cronbach's alpha of .93, the reliance on internal hunger/satiety cues subscale has Cronbach's alpha of .88, and the body–food choice congruence subscale has Cronbach's alpha of .87 (Tylka & Kroon Van Diest, 2013).

The objective of this research was to translate the IES-2 into the Thai language and test its psychometric properties. With the availability of the Thai IES-2, future research can be conducted to explore the theoretical framework or experimental interventions around IE in the Thai population.

Research Methodology

Design of Study

The study was executed in two phases. The first phase involves the translation of the IES-2 into the Thai language. This translation procedure followed the 4 steps of the standardized protocol developed by the World Health Organisation (2003). On top of the protocol, an additional focus group was also carried out to improve the validity (see Figure 1). In the second phase, with 2 stages of analysis, Thai translated version of the IES-2 was then evaluated to ensure that it was psychometrically valid and reliable.

Participants

Among the studies that compared body image-related problems between males and females in Thailand, the results have consistently shown that females were at increasingly greater risk of experiencing negative body image and body dissatisfaction (Paek et al., 2011; Uttravanich & Blauw, 2018), as well as more prone to feel more pressured to fix their body parts that are perceived to be problematic (Thianthai, 2008) than males. Moreover, it has been found that men often report higher intuitive eating levels than women, as more men than women were found to trust that their bodies are telling them how much to eat (Denny et al., 2013; Tylka & Homan, 2015). This further highlights the need for studies among Thai women population.

While women are generally at risk of experiencing self-objectification and negative body image, this was found to be exceptionally true for women during their years of emerging adulthood also known to be the age of instability (Augustus-Horvath & Tylka, 2011; Piran, 2016). When compared to other periods of adulthood, emerging adulthood was also found to be the prominent age where individuals are more susceptible to several mental health issues including depression, burnout, poor relationships, dysfunctional coping behaviors, and suicidality (Rohde et al., 2013). Upon the observation of these trends, research attention should be warranted in studying this age group.

Moreover, it has been suggested that physical appearance is a very prominent factor which Thai people rely upon when managing their impression and conveying their social status, and many Thai women are willing to take any steps, including a variety of serious health-compromising behaviours, that will allow them to attain these standard physical features (Kang,

2021; Rongmuang et al., 2011; Thianthai, 2006). A common way that Thai women use to alter aspects of their physical appearance include engaging in disordered eating behaviours (Manaboriboon et al., 2017). This is exceptionally true for those women in the Central region of Thailand (Rongmuang et al., 2011), most particularly in Bangkok (Thianthai, 2006). On this background, this current study used Bangkok as the region of focus.

The participants in this study were restricted to Thai women in their emerging adulthood, who also live in Bangkok, Thailand. The age of emerging adulthood was specified to be between the ages of 18 to 29 (Arnett, 2014). Participants who were pregnant, obese, or those who had an eating disorder(s) were eliminated from this study. The participants in this study were recruited through convenience sampling (Parker et al., 2019). The informed consent form expressing the objective of the study, confidentiality clauses, and any details the participants may need to know about the research were attached to the first page of the survey questionnaire.

Sample

There were 2 stages of analysis and each stage of the analysis used a separate sample. To conduct an EFA, it is generally accepted that the minimum sample size is required between 100 to 200 participants (Shultz et al., 2020). Hence, for Sample 1, a total sample of 244 participants was used for stage 1 analysis (item identification).

As for a CFA, the rule of thumb for its required sample size can be based on the ratio of cases (N) to free parameters (q), or N:q, and the required minimum ratio is 10:1 (Kyriazos, 2018). Given that the maximum number of q in this study is 23 (in IES-2), the required number of participants in this study was 230. Therefore, for Sample 2, a total sample of 285 participants was used for stage 2 analysis (validity and reliability assessments).

Instruments

The data was collected via an online self-administered survey questionnaire, delivered via Google form. Inclusion criteria and demographic information, such as age, gender, and level of education were collected.

IES-2

The 23-item IES-2 was designed to assess individuals' likelihood to eat intuitively, where a higher score indicates a higher tendency to eat according to their intuition. To adapt the IES-2 to the Thai language, the participants were asked how often they eat intuitively. Scores were reversed where necessary and averaged to create a total score where a higher score indicates a higher tendency to eat intuitively. The creators of the IES-2 suggested that researchers can confidently use the IES-2 as a measure of IE as IES-2 is reliable and valid, as demonstrated by the evident internal reliability, test-retest reliability (over 3 weeks), convergent validity, discriminant validity, and incremental validity. Tested among women, the full scale of IES-2 has reported a Cronbach's alpha of .87, the unconditional permission to eat (UCPE) subscale has Cronbach's alpha of .81, the eating for physical rather than emotional reasons (EPER) subscale has Cronbach's alpha of .93, the reliance on internal hunger/satiety

cues (RHSC) subscale has Cronbach's alpha of .88 and the body–food choice congruence (BFCC) subscale has Cronbach's alpha of .87.

Translation Procedures

The translation procedures consisted of 4 major steps, with an addition of a focus group, to ensure that the Thai-translated version of the questionnaire maintains its conceptual and contextual equivalency to its original intent. Firstly, an expert who is fluent in English and whose first language is Thai conducted a forward translation of the IES-2 from English to Thai. The translation was done in a way that holds the original definition of the term as it was initially intended, hence this was not a literal or a word-by-word translation.

Secondly, an expert panel of three experienced bilingual psychologists was formed to question, identify, and suggest alternatives for any wordings, expressions, and concepts of the translation that may be inadequate, ambiguous, or unclear. The instruments were then translated back into English by an independent translator who is a native English speaker who also has no previous knowledge of the questionnaire. Following this, a focus group was then conducted among three bilingual experts to discuss any inconsistencies in the translation. The translation was edited until a satisfactory version was attained.

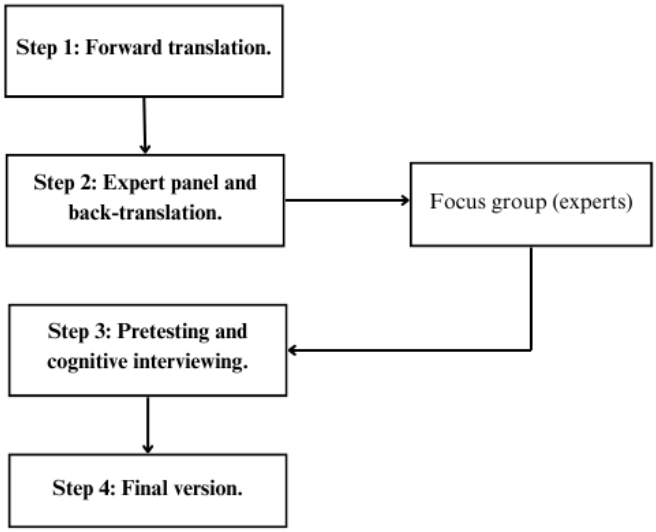
Thirdly, 10 pilot samples of the representing target population were selected for pretesting. The instruments were debriefed to the respondents and these respondents were then asked to test their understanding of the underlying instruments. The respondents were then interviewed about their understanding of the questions. Further modifications of the translation, based on this feedback, were made to improve the wording consistency in the instruments.

Lastly, the final version of the Thai-translated version of the instruments, after having undergone the prior adjustment procedures, was finalized and was ready for use in data collection.

Additionally, before the actual data collection for the study, a pretest of the Thai-translated version of the questionnaires was conducted among 30 participants from the representing sample population to check for any errors and readability of the translated instruments. The participants did not experience any confusion about any items and the result of the pretest did not report any errors or any comprehension problems. The average time taken by the respondents was 10 minutes.

Figure 1

The Instrument Translation Procedures



Data Analyses

Data in this study was analyzed by statistical software. The statistical procedures used include EFA, CFA, and reliability analysis. Before conducting the factor analysis, KMO and Bartlett's Test were tested to examine the adequacy of the correlation matrix.

Under the examination of CFA, convergent validity and discriminant validity were used to evaluate construct validity. Convergent validity was examined by testing factor loadings, average variance extracted (AVE), and composite reliability (CR) (Chin et al., 2018). To evaluate the discriminant validity, the values of AVE were compared to the shared variance (SV, the square of correlation coefficient). Discriminant validity can be accepted when the AVE value is greater than the SV value (Chin et al., 2018).

To measure the reliability or the internal consistency of an instrument, Cronbach's alpha is re commended (Tavakol & Dennick, 2011). The reliability coefficient that is reported to be acce ptable for use in most social science research is .70 (Hair et al., 2006). In addition, composite reliability (CR) can also be used to evaluate internal consistency, with a value of .70 or greate r indicating high reliability (Hair et al., 1998).

Ethical Considerations

The AU Institutional Review Board provided ethical approval on December 1, 2022 (No. 17/2022).

Results and Discussion

Stage 1 Analyses: Item identification (Sample 1, n = 244)

The result of KMO and Bartlett's Test of Sphericity was reported to be highly significant, suggesting that it was sufficient to conduct factor analysis (KMO = .94 > .60; Bartlett's test, $p < .001$). The number of four factors had an eigenvalue greater than one.

Item Identification

Results of EFA reported that 23 items fit well with the 4-factor structure (Refer to Table 1). These components mirrored the subscales of the original IES. Each item has been reported with a rotated factor loading of at least .50 and above, illustrating that each variable is considered meaningful.

Table 1

EFA Factor Loadings in Sample 1 (n = 244)

Factor	Item	1 (α=.97)	2 (α=.95)	3 (α=.93)	4 (α=.90)
Factor 1 (EPER)	IES2. "I find myself eating when I'm feeling emotional (e.g., (EPER) anxious, depressed, sad), even when I'm not physically hungry." IESS.	.85			
	IES5. "I find myself eating when I am lonely, even when I'm not physically hungry."	.79			
	IES10. "I use food to help me soothe my negative emotions."	.69			
	IES11. "I find myself eating when I am stressed out, even when I'm not physically hungry."	.86			
	IES12. "I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort."	.72			
	IES13. "When I am bored, I do NOT eat just for something to do."	.83			
	IES14. "When I am lonely, I do NOT turn to food for comfort."	.77			
	IES15. "I find other ways to cope with stress and anxiety than by eating."	.85			
Factor 2 (UCPE)	IES1. "I try to avoid certain foods high in fat, carbohydrates, or (UCPE) calories."		.89		
	IES3. "If I am craving a certain food, I allow myself to have it."		.86		
	IES4. "I get mad at myself for eating something unhealthy."		.82		
	IES9. "I have forbidden foods that I don't allow myself to eat."		.74		
	IES16. "I allow myself to eat what food I desire at the moment."		.89		
	IES17. "I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat."		.87		

Factor	Item	1 (α =.97)	2 (α =.95)	3 (α =.93)	4 (α =.90)
Factor 3 (RHSC)	IES6. "I trust my body to tell me when to eat."		.74		
	IES7. "I trust my body to tell me what to eat."		.76		
	IES8. "I trust my body to tell me how much to eat."		.81		
	IES21. "I rely on my hunger signals to tell me when to eat."		.73		
	IES22. "I rely on my fullness (satiety) signals to tell me when to stop eating."		.81		
	IES23. "I trust my body to tell me when to stop eating."		.84		
Factor 4 (BFCC)	IES18. "Most of the time, I desire to eat nutritious foods."			.90	
	IES19. "I mostly eat foods that make my body perform efficiently (well)."			.77	
	IES20. "I mostly eat foods that give my body energy and stamina."			.86	

Note: EPER = Eating for Physical Rather Than Emotional Reasons, UCPE = Unconditional Permission to Eat, RHSC = Reliance on Internal Hunger/Satiety Cues, BFCC = Body–Food Choice Congruence

Stage 2 Analyses: Validity and reliability assessments (Sample 1, n = 285)

In this stage, construct validity and internal consistency were utilized in evaluating the Thai IES-2. No changes were made after the stage 1 analysis.

Convergent Validity

A four-factor structure was found in the CFA results for 23 items in the sample (n=250). Goodness-of-fit indices were as follows: $\chi 2$ =651.62 ($p < .001$); df = 226; CFI = .94; TLI = . 93; BL89 = .94; RMSEA = .08 (90% CI = .09 to .07); and SRMR = .08. Both RMSEA value a nd SRMR value were .08 which lies on the high end of acceptable (Hu & Bentler, 1999), but s ince the sample size was not that large i.e. (n=250) and values for other fit indices are above . 90 the model fit was considered acceptable (Barrett, 2007). The standardized factor loadings o f four factors were all positive and significant ($p < .001$) (Refer to Figure 2).

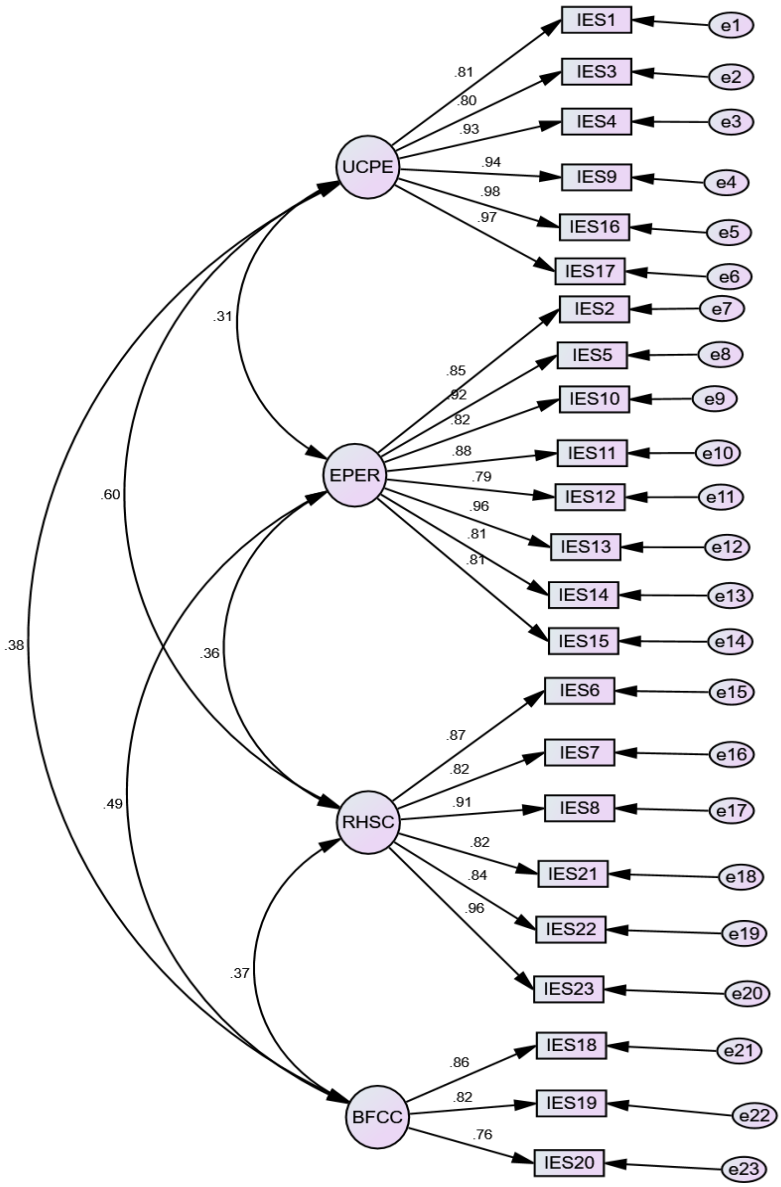
To achieve convergent validity, the AVE of each variable should be above .50 (Hair et al., 2006) and the CR value should be greater than .60 (Chin et al., 2018). Among the four factors, all the AVEs were greater than .50 and all the CRs were greater than .60, indicating convergent validity.

Discriminant Validity

As shown in Table 2, all the AVEs of the four factors were reported to be greater than their SV values.

Figure 2

CFA Standardized Factor Loadings in Sample 2 (n = 285)



Internal Consistency

The overall Cronbach's alpha of the Thai IES-2 was .95, indicating that the internal consistency for all items was high and the scales were highly reliable. As shown in Table 2, all the CRs of the four factors were reported to be greater than .70.

Table 2

Convergent Validity and Discriminant Validity (n = 285)

Factors	Cronach's α	AVE	CR	SV by factor			
				1	2	3	4
1	.96	.825	.966	1			
2	.95	.737	.957	.096	1		
3	.94	.758	.949	.358	.131	1	
4	.85	.666	.856	.141	.239	.138	1

Note: the values of SV were the square of the correlation coefficient between factors

Discussion

This study included two phases. The first phase involved the translation of the IES-2 into the Thai language, followed by a focus group discussion and a pretest to enhance the accuracy of the translation. In the second phase, the psychometric evaluation of the Thai IES-2 using EFA, CFA, and reliability analysis. Overall, the results showed that the Thai IES-2 is reliable and holds adequate construct validity among Thai emerging adult women.

In comparison to the original English version of IES-2 that was tested among women, the statistical results found in this current study were similar to that which was reported in the original IES-2. In both the IES-2 and the Thai IES-2, the full-scale and each of the four subscales were reported to be reliable and valid, with high Cronbach's alpha, all of which were above .80 (Tylka & Kroon Van Diest, 2013).

Moreover, similar results were found when compared against other cross-culturally translated adaptations of IES-2 in the Asian contexts, namely the Chinese Mandarin version (Junhua et al., 2021) and the Japanese version (Namatame & Sawamiya, 2019). While this current study tested the Thai version of the IES-2 among emerging adults in Bangkok, the Chinese Mandarin version of IES-2 was tested among the sample of obese patients with primary hypertension of both genders (Junhua et al., 2021), and the Japanese version of IES-2 was tested among the sample of general population across both genders (Namatame & Sawamiya, 2019). Although the sample population of the three studies was different, the results of the Chinese Mandarin version and the Japanese version of the IES-2 were the same. All of the studies have reported evidence for its reliability and validity. Furthermore, the result of factor analysis, EFA and CFA, the Thai, the Chinese Mandarin, and the Japanese versions of the IES-2 were reported to have a four-factor structure, all of which mirrored the four subscales identified in the original IES-2. All in all, the current study demonstrated that the Thai version of the IES-2 is reliable and valid, hence it is suitable for the assessment of IE in the Thai population.

Conclusion and Recommendations

Overall, there is sufficient evidence to support the Thai IES-2 as a psychometrically sound tool for measuring IE in the Thai context. Further examination of Thai IES-2 in the field of positive psychology and counseling is recommended as Thai IES-2 could prove to be a useful clinical tool in the areas related to positive body image, maladaptive eating, weight management, nutrition, and fitness.

There are several limitations to this study. Firstly, the narrow age range of the sample population makes the finding not generalizable to the other age groups. While the narrow age

range can enhance the study's internal validity of the study, since the sample is homogenous and it can be assumed that there would be less effect of confounding variables such as age-related role changes and physical health, the downside is the low generalizability. It would be necessary to test the Thai IES-2 with both genders and a wider range of age groups since it was only tested on Thai emerging adult women. The second drawback is with the data collection technique used in this study. The only data collection technique used was an online questionnaire and this may impact the generalizability of the findings.

Despite its limitation, this study contributes to the positive psychology and counseling literature, specifically in the field of eating-related behavior and positive body image, by offering a psychometrically sound instrument for measuring IE among Thai emerging adult women. The Thai IES-2 will be available for use among Thai researchers and health professionals whose work is related to positive attitudes and behaviors related to food and eating.

References

Akırmak, Ü., Bakıner, E., Boratav, H. B., & Güneri, G. (2018). Cross-cultural adaptation of the intuitive eating scale-2: psychometric evaluation in a sample in Turkey. *Current Psychology, 40*(3), 1083-1093. https://doi.org/10.1007/s12144-018-0024-3

Alleva, J. M., & Tylka, T. L. (2021). Body functionality: A review of the literature. *Body Image, 36*, 149-171. https://doi.org/10.1016/j.bodyim.2020.11.006

Alleva, J. M., Martijn, C., Van Breukelen, G. J. P., Jansen, A., & Karos, K. (2015). Expand your horizon: A programme that improves body image and reduces self-objectification by training women to focus on body functionality. *Body Image, 15*, 81-89. https://doi.org/10.1016/j.bodyim.2015.07.001

Arnett, J. J. (2014). *Emerging Adulthood: The Winding Road from the Late Teens Through the Twenties* (2nd ed.). Oxford University Press.

Augustus-Horvath, C. L., & Tylka, T. L. (2011). The acceptance model of intuitive eating: A comparison of women in emerging adulthood, early adulthood, and middle adulthood. *Journal of Counseling Psychology, 58*(1), 110-125. https://doi.org/10.1037/a0022129

Barrett, P. (2007). Structural equation modeling: Adjudging model fit. *Special Issue on Structural Equation Modeling*, *42*(5), 815-824. https://doi.org/10.1016/j.paid.2006.09.018

Bas, M., Karaca, K. E., Saglam, D., Arıtıcı, G., Cengiz, E., Köksal, S., & Buyukkaragoz, A. H. (2017). Turkish version of the intuitive eating Scale-2: Validity and reliability among university students. *Appetite*, *114*, 391-397. https://doi.org/10.1016/j.appet.2017.04.017

Birch, L. L., & Fisher, J. O. (2000). Mothers' child-feeding practices influence daughters' eating and weight. *The American journal of clinical nutrition*, *71*(5), 1054-1061. https://doi.org/10.1093/ajcn/71.5.1054

Birch, L. L., Fisher, J. O., & Davison, K. K. (2003). Learning to overeat: maternal use of restrictive feeding practices promotes girls' eating in the absence of hunger. *The American journal of clinical nutrition*, *78*(2), 215-220. https://doi.org/10.1093/ajcn/78.2.215

Birch, L. L., Johnson, S. L., Andresen, G., Peters, J. C., & Schulte, M. C. (1991). The variability of young children's energy intake. *New England Journal of Medicine*, *324*(4), 232-235. https://doi.org/10.1056/NEJM199101243240405

Carbonneau, E., Carbonneau, N., Lamarche, B., Provencher, V., Bégin, C., Bradette-Laplante, M., & Lemieux, S. (2016). Validation of a French-Canadian adaptation of the Intuitive Eating Scale-2 for the adult population. *Appetite*, *105*, 37-45. https://doi.org/10.1016/j.appet.2016.05.001

Carper, J. L., Fisher, J. O., & Birch, L. L. (2000). Young girls' emerging dietary restraint and disinhibition are related to parental control in child feeding. *Appetite*, *35*(2), 121-129. https://doi.org/10.1006/appe.2000.0343

Chin, R. W. A., Chua, Y. Y., Chu, M. N., Mahadi, N. F., Wong, M. S., Yusoff, M. S., & Lee, Y. Y. (2018). Investigating validity evidence of the Malay translation of the Copenhagen Burnout Inventory. *Journal of Taibah University Medical Sciences, 13*(1), 1-9. https://doi.org/10.1016/j.jtumed.2017.06.003

Costanzo, P. R., Reichmann, S. K., Friedman, K. E., & Musante, G. J. (2001). The mediating effect of eating self-efficacy on the relationship between emotional arousal and overeating in the treatment-seeking obese. *Eating Behaviors*, *2*(4), 363-368. https://doi.org/10.1016/S1471-0153(01)00042-3

Da Silva, W. R., Neves, A. N., Ferreira, L., Campos, J. A. D. B., & Swami, V. (2020). A psychometric investigation of Brazilian Portuguese versions of the caregiver eating messages scale and intuitive eating scale-2. *Eating and weight disorders-studies on anorexia, bulimia, and obesity*, *25*(1), 221-230. https://doi.org/10.1007/s40519-018-0557-3

Denny, K. N., Loth, K., Eisenberg, M. E., & Neumark-Sztainer, D. (2013). Intuitive eating in young adults. Who is doing it, and how is it related to disordered eating behaviors?. *Appetite*, *60*, 13-19. https://doi.org/10.1016/j.appet.2012.09.029

Gast, J., & Hawks, S. R. (1998). Weight loss education: the challenge of a new paradigm. *Health Education & Behavior*, *25*(4), 464-473. https://doi.org/10.1177/109019819802500405

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (1998). *Multivariate data analysis* (5th ed.). Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis*. Prentice-Hall.

Hauck, C., Cook, B., & Ellrott, T. (2020). Food addiction, eating addiction and eating disorders. *Proceedings of the Nutrition Society*, *79*(1), 103-112. https://doi.org/10.1017/S0029665119001162

Hawks, S., Madanat, H., Hawks, J., & Harris, A. (2005). The relationship between intuitive eating and health indicators among college women. *American Journal of Health Education, 36*, 331-336. https://doi.org/10.1016/j.appet.2012.09.029

Hawk, S., Merrill, R. M., & Madanat, H. N. (2004). The intuitive eating scale: development and preliminary validation. *American Journal of Health Education*, *35*(2), 90-99. https://doi.org/10.1080/19325037.2004.10603615

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Jacquet, P., Schutz, Y., Montani, J. P., & Dulloo, A. (2020). How dieting might make some fatter: modeling weight cycling toward obesity from a perspective of body composition autoregulation. *International Journal of Obesity*, *44*(6), 1243-1253. https://doi.org/10.1038/s41366-020-0547-1

Junhua, L., Minjuan, W., Guohe, F., Xingwei, Z., & Wenqin, W. (2021). *Localization of Intuitive Eating Scale-2 and Its Application in Chinese Obese Patients with Primary Hypertension.* Advance online publication. https://doi.org/10.21203/rs.3.rs-1152387/v1

Kang, D. B. C. (2021). The duty to transform: Properly refining the body and (re)defining oneself in Thailand. *Asian Studies Review, 45*(2), 272-289. https://doi.org/10.1080/10357823.2021.1895722

Kyriazos, T. A. (2018). Applied psychometrics: sample size and sample power considerations in factor analysis (EFA, CFA) and SEM in general. *Psychology, 9*(8), 2207. doi:10.4236/psych.2018.98126

Linardon, J., & Mitchell, S. (2017). Rigid dietary control, flexible dietary control, and intuitive eating: Evidence for their differential relationship to disordered eating and body image concerns. *Eating Behaviors, 26*, 16-22. https://doi.org/10.1016/j.eatbeh.2017.01.008

Linardon, J., Tylka, T. L., & Fuller-Tyszkiewicz, M. (2021). Intuitive eating and its psychological correlates: A meta-analysis. *International Journal of Eating Disorders, 54*(7), 1073-1098. https://doi.org/10.1002/eat.23509

Madden, C. E. L., Leong, S. L., Gray, A., & Horwath, C. C. (2012). Eating in response to hunger and satiety signals is related to BMI in a nationwide sample of 1601 mid-age New Zealand women. *Public Health Nutrition, 15*, 2272-2279. https://doi.org/10.1017/S1368980012000882

Manaboriboon, B., In-iw, S., Winijkul, G., Choowong, T., Suwanwaree, J., & Apinuntavech, S. (2017). Eating Disorder Susceptibility among University Students In Thailand. *Southeast Asian J Trop Med Public Health, 48*(2), 19-28. https://www.tm.mahidol.ac.th/seameo/2017-48-suppl-2/2017-48-supp2-019.pdf

Namatame, H., & Sawamiya, Y. (2019). Development of Japanese version of the Intuitive Eating Scale-2. *Journal of Japanese Clinical Psychology, 37*(3), 238-248. https://doi.org/10.4992/jjpsy.88.16216

Nejati, B., Fan, C. W., Boone, W. J., Griffiths, M. D., Lin, C. Y., & Pakpour, A. H. (2020). *Validating the Persian intuitive eating scale-2 among breast cancer survivors who are overweight/obese*. Evaluation & the Health Professions

Paek, H. J., Nelson, M. R., & Vilela, A. M. (2011). Examination of gender-role portrayals in television advertising across seven countries. *Sex roles, 64*(3), 192-207. http://doi.org/10.1007/s11199-010-9850-y

Parker, C., Scott, S., & Geddes, A. (2019). *Snowball sampling.* SAGE research methods foundations. https://dx.doi.org/10.4135/9781526421036831710

Piran, N. (2016). Embodied possibilities and disruptions: The emergence of the Experience of Embodiment construct from qualitative studies with girls and women. *Body Image, 18*, 43-60. http://dx.doi.org/10.1016/j.bodyim.2016.04.007

Polivy, J., & Herman, C. P. (1999). Distress and eating: why do dieters overeat?. *International Journal of Eating Disorders*, *26*(2), 153-164. https://doi.org/10.1002/(SICI)1098-108X(199909)26:2%3C153::AID-EAT4%3E3.0.CO;2-R

Rohde, P., Lewinsohn, P. M., Klein, D. M., Seeley, J. R., & Gau, J. M. (2013). Key characteristics of major depressive disorder occurring in childhood, adolescence, emerging adulthood, and adulthood. *Clinical Psychological Science, 1*, 41-53. https://doi.org/10.1177/2167702612457599

Román, N., Rigó, A., Gajdos, P., Tóth-Király, I., & Urbán, R. (2021). Intuitive eating in light of other eating styles and motives: Experiences with construct validity and the Hungarian adaptation of the Intuitive Eating Scale-2. *Body Image*, *39*, 30-39. https://doi.org/10.1016/j.bodyim.2021.05.012

Rongmuang, D., Corte, C., McCreary, L. L., Park, C. G., Miller, A., & Gallo, A. (2011). Salience of physical appearance characteristics among young women in Thailand. *Body image, 8*(4), 396-403. https://doi.org/10.1016/j.bodyim.2011.05.004

Ruzanska, U. A., & Warschburger, P. (2017). Psychometric evaluation of the German version of the Intuitive Eating Scale-2 in a community sample. *Appetite*, *117*, 126-134. https://doi.org/10.1016/j.appet.2017.06.018

Schaefer, J. T., & Magnuson, A. B. (2014). A review of interventions that promote eating by internal cues. *Journal of the Academy of Nutrition and Dietetics*, *114*(5), 734-760. https://doi.org/10.1016/j.jand.2013.12.024

Shultz, K. S., Whitney, D. J., & Zickar, M. J. (2020). Confirmatory Factor Analysis. Routledge. https://doi.org/10.4324/9781003127536

Swami, V., Maïano, C., Todd, J., Ghisi, M., Cardi, V., Bottesi, G., & Cerea, S. (2021). Dimensionality and psychometric properties of an Italian translation of the Intuitive Eating Scale-2 (IES-2): An assessment using a bifactor exploratory structural equation modelling framework. *Appetite*, *166*, 105588. https://doi.org/10.1016/j.appet.2021.105588

Swami, V., Todd, J., Zahari, H. S., Khatib, N. A. M., Toh, E. K. L., & Barron, D. (2020). Dimensional structure, psychometric properties, and sex and ethnic invariance of a Bahasa Malaysia (Malay) translation of the Intuitive Eating Scale-2 (IES-2). *Body image*, *32*, 167-179. https://doi.org/10.1016/j.bodyim.2020.01.003

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53-55. https://doi.org/10.5116/ijme.4dfb.8dfd

Thianthai, C. (2006). Influential sources affecting Bangkok adolescent body image perceptions. *International Journal of Adolescent Medicine and Health, 18*(4), 633-641. https://doi.org/10.1515/IJAMH.2006.18.4.633

Thianthai, C. (2008). Do male and female adolescents view their dissatisfaction with body parts in the same way?. *International Journal of Adolescent Medicine and Health, 20*(1), 33-39. https://doi.org/10.1515/IJAMH.2008.20.1.33

Tribole, E., & Resch, E. (1995). *Intuitive eating: a recovery book for the chronic dieter.* St. Martin's Press.

Tylka, T. L. (2006). Development and psychometric evaluation of a measure of intuitive eating. *Journal of Counseling Psychology, 53*(2), 226-240. https://doi.org/10.1037/0022-0167.53.2.226

Tylka, T. L., & Homan, K. J. (2015). Exercise motives and positive body image in physically active college women and men: Exploring an expanded acceptance model of intuitive eating. *Body image*, *15*, 90-97. https://doi.org/10.1016/j.bodyim.2015.07.003

Tylka, T. L., & Kroon Van Diest, A. M. (2013). The Intuitive Eating Scale-2: item refinement and psychometric evaluation with college women and men. *Journal of Counseling Psychology, 60,* 137-153. https://doi.org/10.1037/a0030893

Tylka, T. L., & Wilcox, J. A. (2006). Are intuitive eating and eating disorder symptomatology opposite poles of the same construct?. *Journal of Counseling Psychology*, *53*(4), 474-485. https://doi.org/10.1037/0022-0167.53.4.474

Tylka, T. L., Calogero, R. M., & Daníelsdóttir, S. (2015). Is intuitive eating the same as flexible dietary control? Their links to each other and well-being could provide an answer. *Appetite*, *95*, 166-175. https://doi.org/10.1016/j.appet.2015.07.004

Uttravanich, A., & Blauw, J. N. (2018). Facebook Use, Appearance Comparison, Body Dissatisfaction, and Self-Esteem in Thai Female Facebook Users. *Scholar: Human Sciences, 10*(1), 201-201. http://www.assumptionjournal.au.edu/index.php/Scholar/article/view/3324

Van Dyke, N., & Drinkwater, E. J. (2014). Review article relationships between intuitive eating and health indicators: literature review. *Public Health Nutrition*, *17*(8), 1757-1766. https://doi.org/10.1017/S1368980013002139

Vartanian, L. R. (2015). Impression management and food intake: Current directions in research. *Appetite, 86*(1), 74-80. https://doi.org/10.1016/j.appet.2014.08.021

Warren, J. M., Smith, N., & Ashwell, M. (2017). A structured literature review on the role of mindfulness, mindful eating and intuitive eating in changing eating behaviours: effectiveness and associated potential mechanisms. *Nutrition Research Reviews, 30*(2), 272-283. https://doi.org/10.1017/S0954422417000154

Westenhoefer, J., Engel, D., Holst, C., Lorenz, J., Peacock, M., Stubbs, J., & Raats, M. (2013). Cognitive and weight-related correlates of flexible and rigid restrained eating behaviour. *Eating behaviors*, *14*(1), 69-72. https://doi.org/10.1016/j.eatbeh.2012.10.015

Woody, E. Z., Costanzo, P. R., Liefer, H., & Conger, J. (1981). The effects of taste and caloric perceptions on the eating behavior of restrained and unrestrained subjects. *Cognitive Therapy and Research*, *5*(4), 381-390. https://doi.org/10.1007/BF01173690

World Health Organization. (2003). *Collaborative study on substitution therapy of opioid dependence and HIV/AIDS general protocol (version 2.1)*. https://www.researchgate.net/.