Food Quality and Preference 117 (2024) 105155

Contents lists available at ScienceDirect

Food Quality and Preference

journal homepage: www.elsevier.com/locate/foodqual

Intuitive eating: Validation of a brief Italian version of IES-2 for university students and its relationship with food intake

Luigina Canova [a,1], Daniela Caso [b,2], Marcella Bianchi [b,3,*], Miriam Capasso [b,4]

[a] Department of Philosophy, Sociology, Education and Applied Psychology, University of Padua, Padua, Italy
[b] Department of Humanities, University of Naples Federico II, Naples, Italy

ARTICLE INFO

Keywords:
Intuitive eating
Intuitive Eating Scale-2
University students
Scale validation
Measurement invariance

ABSTRACT

Intuitive eating is an adaptive eating style referring to a set of eating behaviors characterized by reliance on internal hunger and satiety cues rather than situational and emotional cues. It has four dimensions: Unconditional Permission to Eat, Eating for Physical rather than Emotional Reasons, Reliance on Hunger and Satiety Cues, and Body-Food Choice Congruence. Two studies explored the psychometric characteristics of a new Italian version of the Intuitive Eating Scale-2 (IES-2) among university students. Study 1 ($n = 462$; $M_{age} = 22.36$, $SD = 2.10$; 58.7 % females) evaluated the four-factor structure via CFA, resulting, with post-hoc modifications, in a 15-item version. Measurement invariance across gender, gender differences, and relationships with BMI were tested. Study 2 ($n = 359$; $M_{age} = 20.35$, $SD = 1.77$; 61.8 % females) verified the construct validity of the 15-item scale and explored criterion validity by examining the correlations with self-esteem, well-being, emotional, external, and restrained eating styles. Furthermore, the relationship between intuitive eating and food intake was explored. Overall results confirmed the four-factor structure, measurement invariance across gender, and criterion validity. The scale showed good psychometric properties in university students. Intuitive eating was associated with a healthier psychological status and lower risk of high-weight status, but it was not consistently associated with all markers of a healthy diet.

1. Introduction

In the context of psychosocial literature, it is not new that university students have lifestyles and dietary habits whose peculiarities are often less healthy than those preferred by the general population (Choi, 2020). In particular, they tend to have an inadequate intake of food nutrients since their choices about *what to eat* seem to rely on cheaper and easily accessible food (Vélez-Toral, Rodríguez-Reinado, Ramallo-Espinosa, & Andrés-Villas, 2020), resulting in a preponderance of food high in fat and sugar and a suboptimal consumption of fruit and vegetables (Caso, Capasso, Fabbricatore, & Conner, 2020). Moreover, regarding the main factors affecting their prompts about *when to eat*, some studies have pointed out a tendency to especially eat unhealthy foods as a way to cope with boredom or stress (Choi, 2020), while the consumption of unhealthy snacks throughout the day appears to be a well-consolidated praxis (Caso et al., 2020). Furthermore, research also showed high weight and body size concerns among university students, affecting their eating behavior (Yong et al., 2021).

These common unhealthy eating behaviors can reflect individual tendencies to regulate food consumption well described by the three eating styles individuated by van Strien, Frijters, Bergers, and Defares (1986), namely emotional, restrained and external eating. Precisely, emotional eating concerns a tendency to eat as a response to negative emotional states (Altheimer & Urry, 2019). Restrained eating is defined as a conscious limitation of food consumption to lose or maintain weight, which is also often susceptible to episodes of overeating while facing stressful situations (Polivy & Herman, 2020). Finally, external eating is the tendency to eat in response to external food-related stimuli

* Corresponding author.
E-mail addresses: luigina.canova@unipd.it (L. Canova), daniela.caso@unina.it (D. Caso), marcella.bianchi@unina.it (M. Bianchi), miriam.capasso@unina.it (M. Capasso).
[1] https://orcid.org/0000-0001-9444-6895.
[2] https://orcid.org/0000-0002-6579-963X.
[3] https://orcid.org/0000-0002-9417-7119.
[4] https://orcid.org/0000-0002-9094-5635.

https://doi.org/10.1016/j.foodqual.2024.105155
Received 11 October 2023; Received in revised form 4 March 2024; Accepted 5 March 2024
Available online 9 March 2024

rather than an internal state of hunger and satiety (van Strien et al., 1986). As literature has widely proven the over-diffusion of such nonadaptive eating styles among university students (Nolan & Geliebter, 2012), this evidence is quite alarming, considering that university years are critical for forming eating habits that will affect adult life (Poobalan, Aucott, Clarke, & Smith, 2014). Thus, in recent years scholars have been interested in conceptualizing and promoting different approaches to eating behavior, which could also be related to positive health outcomes, such as intuitive eating (Linardon, Tylka, & Fuller-Tyszkiewicz, 2021).

Intuitive eating is a type of adaptive eating style, which refers to a set of eating behaviors characterized by a reliance on physiological hunger and satiety cues (Tribole & Resch, 2003). Individuals who eat intuitively are not preoccupied with food and dieting, but primarily trust internal cues about *when*, *what* and *how* to eat, care about taste, allow themselves to eat when feeling the hunger signals, refusing to label some foods as forbidden and choosing foods to support or enhance their body's functioning (Tylka & Kroon Van Diest, 2013). Intuitive eating is considered an important non-dieting approach to promoting healthy eating, a better relationship with food, an appropriate weight, and improved psychological well-being (Linardon et al., 2021).

1.1. The intuitive eating scale-2

The most widespread instrument to measure intuitive eating is the Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013), developed to improve the earlier Intuitive Eating Scale (Tylka, 2006). Tylka (2006) clustered the ten principles of intuitive eating offered by Tribole and Resch (2003) – who also coined the intuitive eating construct – into three domains and developed 21 items to measure them. The first domain, Unconditional Permission to Eat (UPE), reflects individuals' willingness to eat food they desire at the moment and their refusal to label certain foods as forbidden. The second, Eating for Physical rather than Emotional Reasons (EPR), represents eating patterns in which individuals eat because they are physically hungry rather than to cope with emotional distress, such as anxiety, loneliness, and boredom. Finally, Reliance on Hunger and Satiety Cues (RHSC) reflects individuals' trust in their hunger and satiety cues and reliance on these cues to guide their eating behavior: individuals start eating because they are physically hungry, and they stop eating when satiety is achieved. The original IES did not assess a component of intuitive eating described by Tribole and Resch (2003) as a tendency to honour health or practice "gentle nutrition", reflecting a way of making food choices that celebrate health and body functioning by choosing nutritious foods that promote energy, stamina, and body performance. In the revised IES-2, Tylka and Kroon Van Diest (2013) added three items in order to assess this domain of intuitive eating and labeled it as Body-Food Choice Congruence (B-FCC). In their study, conducted in the US on three different samples of university students, exploratory (EFA) and confirmatory factor analyses (CFA) upheld the hypothesized four-factor structure (the original three factors, plus Body-Food Choice Congruence) and a higher-order factor (i.e., intuitive eating). Furthermore, the factorial structure of IES-2 was invariant across gender.

After publication, the IES-2 has been validated in different countries on samples from general or specific populations. However, only a few studies, except the original research (Tylka & Kroon Van Diest, 2013), focused on the college students population (e.g., Román, Rigób, Gajdos, Tóth-Királyc, & Urbán, 2021; Saunders, Nichols-Lopez, & Frazier, 2018).

In the literature, results regarding the factorial structure of IES-2 are mixed. Some adaptation studies have supported the parent four-factor model (e.g., Barrada, van Strien, & Cebolla, 2020; Carbonneau et al., 2016; Ruzanska & Warschburger, 2017; Van Dyck, Herbert, Happ, Kleveman, & Vögele, 2016), whereas others studies have supported the four-factor model following omission of several items or did not achieve a good fit for the second-order factor structure (e.g., Akırmak, Bakıner, Boratav, & Güneri, 2021; Małachowska & Jeżewska-Zychowicz, 2022; Román et al., 2021). Other studies have supported factorial models with a different number of dimensions and the omission of several items (e.g., Camilleri et al., 2015; Saunders et al., 2018; Swami et al., 2020; Vintilă et al., 2020). In many of these studies, acceptable goodness of fit indices was obtained by estimating error covariances between similarly phrased items.

Swami et al. (2021) sustained that these incoherent results, in addition to cultural/national differences in the construct of intuitive eating, may be related to the highly restrictive assumptions of the CFA model. To overcome these issues, some scholars suggested using exploratory structural equation modeling (ESEM) or bi-factor structural equation model (B-ESEM). In two recent studies – one of which examined an Italian sample – Swami et al. (2021) suggested that it is possible to conceptualize the IES-2 structure as consisting of four specific factors (S-factors, namely the subscales as, for example, EPR) and a global intuitive eating factor (G-factor, that is intuitive eating), with the G- and S-factors being orthogonal. These authors found that a four-factor B-ESEM model had an adequate fit to the data, and such a fit was improved when the correlated uniqueness of seven negatively worded IES-2 items was accounted for. However, a recent study by Ramalho, Saint-Maurice, Félix, and Conceição (2022) found that neither the higher-order model originally proposed nor a bi-factor model was suitable for modeling intuitive eating in adolescents. Barrada et al. (2020), comparing the best-fitting CFA model with an exploratory structural equation model (ESEM), found that the best-fitting solution for IES-2 was the CFA model with correlated uniquenesses. In conclusion, the debate about the IES-2 factor structure remains open and more research is needed to confirm its factorial structure in general and specific populations.

Overall, the IES-2 scores showed adequate internal consistency and good test–retest reliability (e.g., Camilleri et al., 2015; Swami et al., 2021). As for single subscales, some studies found the UPE subscale presenting lower reliability (e.g., Akırmak et al., 2021; Horwath, Hagmann, & Hartmann, 2019). Finally, several studies supported the IES-2 measurement invariance across gender (e.g., Swami et al., 2020; Swami et al., 2021; Tylka & Kroon Van Diest, 2013; Vintilă et al., 2020).

Negative relationships between intuitive eating (considering total scores of IES-2) and BMI have been reported in some studies (e.g., Akırmak et al., 2021; Carbonneau et al., 2016; Swami et al., 2021; Tylka & Kroon Van Diest, 2013), but not in others (e.g., Swami et al., 2020). However, a recent *meta*-analysis (Linardon et al., 2021) concluded that BMI was negatively associated with intuitive eating. As regards gender, in the same *meta*-analysis, Linardon et al. (2021) found that men reported a higher level of intuitive eating than women.

Many studies have investigated the relationships between intuitive eating and various mental health and well-being indices, showing that intuitive eating was negatively associated with disturbances in eating patterns and body image concerns; on the other hand, it was positively associated with self-esteem and psychological well-being (Linardon et al., 2021).

Other studies (e.g., Barrada et al., 2020; Ruzanska & Warschburger, 2017; Van Dyck et al., 2016) analyzed the relationships between intuitive eating and the eating styles measured by the Dutch Eating Behavior Questionnaire (DEBQ, van Strien et al., 1986), namely restrained, emotional, and external eating. Results showed that the IES-2 total score negatively correlated with the three eating styles. Particularly, the UPE subscale was largely correlated in a negative direction with restrained eating, and the EPR subscale with emotional eating.

Finally, the IES-2 total score and most IES-2 subscales scores were negligibly related to social desirability (Tylka & Kroon Van Diest, 2013).

1.2. Intuitive eating and food intake

Some authors (Tylka, 2006; Tribole & Resch, 2003) have argued that intuitive eating could play a protective role in the development of obesity. However, few studies have investigated the relationship

between intuitive eating and food intake. Positive relationships between IES-2 total score and vegetable and fruit consumption emerged among female college students (Barad et al., 2019) and Hispanic American college students (Saunders et al., 2018). Other studies considered the associations between the dimensions of IES-2 and food intake: UPE showed, in men and women, a negative correlation with fruit and vegetable intake (Barad et al., 2019; Camilleri et al., 2017; Horwath et al., 2019) and a positive correlation with sweets and salty snacks (Camilleri et al., 2017; Horwath et al., 2019) and added sugar consumption (Jackson, Sano, Parker, Cox, & Lanigan, 2022). These findings showed that the UPE subscale was negatively correlated with diet quality. EPR was inversely associated with the consumption of sweets and fatty products (Camilleri et al., 2017) and fast-food consumption (Horwath et al., 2019) and it was positively associated with fruit and vegetable intake only in women (Barad et al., 2019). Regarding RHSC, positive associations emerged with self-reported intake of healthy food (Ruzanska & Warschburger, 2020) and lower energy intake (Camilleri et al., 2017). However, in other studies, this dimension was not associated with higher diet quality, as it was correlated positively with the consumption of sweets (Małachowska & Jeżewska-Zychowicz, 2022). B-FCC was associated with higher fruit and vegetable intake and lower intake of sweets (Barad et al., 2019; Małachowska & Jeżewska-Zychowicz, 2022) and with higher intake of vegetables and whole grains (Jackson et al., 2022). Some authors (e.g., Tribole & Resch, 2003; Tylka, 2006) have argued that intuitive eating could play a protective role in the development of obesity and that it may be a promising alternative to deliberate food restriction. Thus, more evidence about the relationship between intuitive eating and food intake is need.

1.3. The present studies

The purpose of the present research was to translate, adapt and validate the original IES-2 for the Italian university student population. As said above, apart from the original study, very few subsequent studies have explicitly considered this population of young adults. The choice to specifically validate this scale in this population is also anchored to the broad literature indicating university students as particularly vulnerable to developing nonadaptive eating styles (Choi, 2020), which are prone to establish in the long run, also affecting adult life (Poobalan et al., 2014).

Study 1 examined the factorial structure, reliability, measurement invariance across gender, gender differences and relationships with BMI of a new Italian version of IES-2. Another Italian version of the 23-item IES-2, which was unavailable at the time of data collection, has been developed by Swami et al. (2021) and its factorial structure was analyzed by B-ESEM model. However, the mixed results about the IES-2 factorial structure suggest that it may vary in different settings and cannot be replicated in any sample without previous testing it. In our research, we preferred to use the CFA approach, which, although highly restrictive, allows us to identify items that are "pure" indicators of the construct they are intended to measure. Furthermore, both the original model by Tylka and Kroon Van Diest (2013) and almost all subsequent scale validations were conducted with this technique. Finally, regarding relationships with gender and BMI, in line with the literature, we hypothesized that men reported higher levels of intuitive eating than women and that BMI was negatively associated with intuitive eating.

The goal of Study 2 was to cross-validate, on a separate sample, the results of Study 1 regarding the new Italian IES-2 factorial structure and relationships with gender and BMI. Further, this second study aimed to assess the concurrent criterion validity of the IES-2, examining the relationships with self-esteem, well-being and eating styles as measured by DEBQ (van Strien et al., 1986). Based on previous results, we expected positive associations with self-esteem and well-being and negative associations with the other eating styles, particularly considering the negative associations between emotional eating and EPR subscale and between restrained eating and UPE subscale.

Relationships with social desirability were also examined. Only the parent study by Tylka and Kroon Van Diest (2013) examined this relation. As research has well-established, people often tend to provide inaccurate estimates of their food consumption and eating style, emphasizing their behavior in a more socially acceptable frame, with the effect of mining the validity of research based on self-report measures. For such a reason, to control this impact, it is important to know how this scale performs in this sense.

Finally, as we said above, there is a lack of studies examining the relationship between intuitive eating and food intake. Therefore, among Study 2 aims, we also examined the associations of the four dimensions of the IES-2 with self-reported food intake. However, since the results of the few previous studies are mixed, we did not formulate hypotheses regarding the associations between IES-2 dimensions and food intake patterns.

2. Study 1

2.1. Materials and methods

2.1.1. Data collection

Data were collected between November and December 2021 (during the sanitary emergency caused by COVID-19). Participants were initially recruited among students attending courses in Psychology at two Italian universities (University of Padua and University of Naples Federico II). These universities were chosen as they are located in two different geographical areas of the country (North, in the case of the University of Padua, and South, in the case of the University of Naples Federico II).

Students were asked to personally fill out and to have at least four students from other courses and/or universities complete an online self-report questionnaire created through the Qualtrics platform. Also, the survey link was shared on social media platforms. At the beginning of the survey, participants were requested to read an instruction paragraph where they were made familiar with the aim of the study, the estimated duration of the task (about 10 min), and the possibility of withholding their consent to participate at any time; they were also assured that all answers would remain confidential. Then, they provided their informed consent (by clicking the "I accept" button on the questionnaire Web page). Participants did not receive any form of economic remuneration. In the case of students from the University of Naples Federico II, the participation in the survey was exchanged with one university credit. Overall, 758 university students accessed the online questionnaire, and 567 completed it (74.8 %). However, to obtain a homogeneous sample by age, only the participants who declared an age between 18 and 30 years were retained ($n = 462$; final rate: 60.9 %).

This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving human subjects were approved by the Ethical Committee of Psychological Research of the Department of Humanities of the University of Naples Federico II (prot. n° 33/2021). All participants gave informed consent to join the research.

2.1.2. Measures

The translation process of the IES-2 included both the forward and the backward steps and the pilot test to gather feedback on the readability and comprehensibility of the translated scale. The instrument was administered to 10 individuals, and no significant word changes were made. A comparison of the two Italian versions of the IES-2 scale – the one used in this research and that of Swami et al. (2021) – did not reveal substantial differences in items meaning and wording.

The 23-item IES-2 includes four dimensions: 1) Eating for Physical Rather than Emotional Reasons (EPR, 8 items, e.g., "I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort"); 2) Unconditional Permission to Eat (UPE, 6 items, e.g., "If I am craving a certain food, I allow myself to have it"); 3) Reliance on Hunger and Satiety Cues (RHSC, 6 items, e.g., "I rely on my hunger

signals to tell me when to eat"); and 4) Body-Food Choice Congruence (B-FCC, 3 items, e.g., "Most of the time, I desire to eat nutritious foods"). Items are rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with each point on the scale associated with a label anchor. Higher scores indicated greater levels of intuitive eating or its dimensions.

Socio-demographic characteristics included gender, age, geographic area of residence, the university attended, and self-reported height and weight. Body Mass Index (BMI) was calculated by self-reported height and weight using the standard formula: weight (kg)/height (m)^2.

2.1.3. Participants

The final sample included 271 women (58.7 %) and 190 men (41.1 %; one missing value) attending different degree courses ($M_{age} = 22.36$, $SD = 2.10$). One hundred and eighty-two (39.4 %) were from the University of Naples Federico II, 153 (33.1 %) from the University of Padua, and 125 (27.1 %) were from other universities in North and South Italy (two missing values). The percentage of participants who lived in North Italy was equal to 35.1 % ($n = 162$), 6.1 % lived in Central Italy ($n = 28$), and 58.7 % lived in South Italy ($n = 271$; one participant lived abroad). Concerning participants' BMI, the mean for the sample was 22.47 ($SD = 3.67$; 6 missing values). Based on the World Health Organization classification system (World Health Organization, 2000), 44 participants (9.5 %) reported an underweight BMI (<18.5), 324 (70.1 %) reported a normal BMI (between 18.5 and 24.9), 63 (13.6 %) an overweight BMI (between 25 and 29.9), and 25 (0.4 %) reported an obese BMI (>30).

2.1.4. Data analysis

There were no missing data on IES-2 items, as participants were prompted to respond to all items. Prior to analyses, all negatively keyed IES-2 items were reverse-coded so that all reported loadings were positive. To test the factorial structure of the IES-2, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were employed. Parallel analysis was carried out to identify the number of factors underlying the 23 items of the original version of IES-2. In the next step, a CFA (using the maximum likelihood method and the covariance matrix as input) was performed to inspect the original factor structure of IES-2 and, thus, the validity of the *a priori* model. A higher-order CFA model, including the four first-order factors and one second-order factor of intuitive eating, was also estimated. All analyses were carried out using MPLUS (version 8.5). To assess the adequateness of the measurement model, we considered the following indexes: χ^2 test, χ^2/df, the comparative fit index (CFI), the root-mean-square error of approximation (RMSEA) with a confidence interval of 90 %, and the standardized root-mean-square residual (SRMR). Typically, a satisfactory model is denoted by χ^2 not being significant, $\chi^2/df \leq 3$, RMSEA ≤ 0.06, CFI ≥ 0.95, and SRMR ≤ 0.08, although RMSEA values of approximately 0.08 are also acceptable (Hu & Bentler, 1999). Convergent validity was assessed by calculating the average variance extracted (AVE) for each factor: AVE ≥ 50 was considered adequate. Next, discriminant validity was evaluated by comparing the squared correlations among factors and AVEs values: when the AVE values were higher than the squared correlations among factors, the discriminant validity was considered adequate (Fornell & Larcker, 1981). Composite reliabilities (CR) and Cronbach's alpha coefficients were computed to estimate the reliability.

To determine measurement invariance across gender, the multigroup procedure was applied with the following consequential hypotheses: (i) configural invariance (that requires an identical number of factors and the same pattern of factor-item relations across the two groups); (ii) metric invariance (i.e., invariance of factor loadings across groups); (iii) scalar invariance (i.e. invariance of factor loadings and item intercepts across groups); (iv) strict invariance (that requires metric invariance, scalar invariance and error invariance); (v) invariance of the latent variances/covariances (that also requires invariance of latent factors variances and covariances among latent factors). Model comparisons (the preceding model served as a comparison) were based on a chi-square difference test. However, since $\Delta\chi^2$ statistic is overly stringent criterion invariance, we used changes in CFI (ΔCFI), RMSEA (ΔRMSEA) and SRMR (ΔSRMR) to evaluate measurement invariance. If $\Delta CFI \leq 0.010$, $\Delta RMSEA \leq 0.015$, and $\Delta SRMR \leq 0.030$ for tests of factor loading invariance, and $\Delta CFI \leq 0.010$, $\Delta RMSEA \leq 0.015$, and $\Delta SRMR \leq 0.010$ for tests of intercept invariance, then measurement invariance is evidenced (Chen, 2007).

To compare intuitive eating scores of men and women, a multivariate analysis of variance (MANOVA) was performed. To estimate effect sizes (Cohen, 1988), partial eta squared (η^2_{par}) was calculated ($\eta^2_{par} = 0.01$ small, $\eta^2_{par} = 0.06$ medium, $\eta^2_{par} = 0.14$ large effect size). Finally, Pearson correlation coefficients between the IES-2 subscales and BMI were calculated ($r_s > 0.50$ indicate a large/strong effect size; r_s around 0.30, a medium/moderate effect size; and r_s around 0.10, a slight/negligible effect size). SPSS 27 was used for descriptive analyses, Cronbach's alpha, correlations, and MANOVA.

2.2. Results

2.2.1. Preliminary analyses and exploratory factor analysis

The skewness for all item distributions fell between -0.68 and 0.57, kurtosis fell between -1.21 and 0.70, and they did not highlight severe violations of the normality of the univariate distributions of the items. EFA (geomin rotation) was performed. Parallel analysis indicated that four factors from the actual data had eigenvalues higher than the criterion eigenvalue generated from the random data (i.e., λ_1 5.96 > 1.43, λ_2 3.04 > 1.36, λ_3 2.28 > 1.30, λ_4 1.81 > 1.26), confirming the number of factors of the parent study (Tylka & Kroon Van Diest, 2013). Not all fit indices of the four factors model were satisfactory, $\chi2(167) = 559.53$, $p = .00$, $\chi2/df = 3.35$, RMSEA = 0.07, 90 % CI [0.07, 0.08], CFI = 0.91, SRMR = 0.04. Considering a cut-off of > 0.400 for significant factor loadings, we found no cross-loadings. Twenty-two items had factor loadings higher than 0.400 on their own factor except the item IES17 (UPE) "I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat", whose loadings were lower than 0.400 for all factors. The following correlations between the factors were significant ($p_s < 0.05$): EPR-UPE, $r = 0.18$; EPR-RHSC, $r = 0.30$; EPR-BFCC, $r = 0.17$; UPE-RHSC, $r = 0.31$. BFCC was not correlated ($r_s = 0.06$) with UPE and RHSC.

2.2.2. Confirmatory factor analysis

Goodness-of-fit indices of the first CFA conducted on the 23-items IES-2 were not satisfactory: $\chi^2_{224} = 939.87$, $p \cong 0.00$, $\chi^2/df = 4.19$, RMSEA = 0.08, 90 % CI [0.08, 0.09], CFI = 0.84, SRMR = 0.08. To explore sources of ill-fit, factor loadings and modification indices for cross-loadings higher than 10 were examined. Item IES17 (UPE) "I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat" had the lowest loading. Other items, namely IES1 (UPE) "I try to avoid certain foods high in fat, carbohydrates, or calories (R)", IES4 (UPE) "I get mad at myself for eating something unhealthy (R)", IES6 (RHSC) "I trust my body to tell me when to eat", IES7 (RHSC) "I trust my body to tell me what to eat", IES13 (EPR) "When I am bored, I do NOT eat just for something to do", IES14 (EPR) "When I am lonely, I do NOT turn to food for comfort", and IES15 (EPR) "I find other ways to cope with stress and anxiety than by eating" had relatively high modification indices for cross-loadings. Alternative CFA models were run sequentially, removing these items one by one, starting with the lowest factor loading item and highest modification index. A final model with 15 items showed good fit indices: $\chi^2_{84} = 189.40$, $p \cong 0.00$, $\chi^2/df = 2.25$, RMSEA = 0.05, 90 % CI [0.04, 0.06], CFI = 0.96, SRMR = 0.05. The inspection of the modification indices showed that the model could be improved by estimating the error covariance between one pair of items, namely IES11 (EPR) "I find myself eating when I am stressed out, even when I'm not physically hungry" and IES2 (EPR) "I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry". These items could share method effects

because they have some degree of overlap in meaning and wording. Fit indices of this model were only slightly better: $\chi^2_{83} = 176.87$, $p \cong 0.00$, $\chi^2/df = 2.13$, RMSEA = 0.05, 90 % CI [0.04, 0.06], CFI = 0.97, SRMR = 0.05. The standardized factor loadings (λ) were all statistically significant ($p < .001$; Table 1). The correlations between UPE and RHSC (ϕ = 0.38) and between RHSC and EPR (ϕ = 0.31) were significant ($p < .001$) and medium in size; the correlation between UPE and EPR (ϕ = 0.17) although significant ($p < .004$) was small in size. B-FCC was weakly correlated only with EPR (ϕ = 0.16, $p < .004$).

The average variance extracted (AVE; Table 1), which reflects the overall amount of shared variance among the indicators that measure a latent construct, was adequate (>. 50) for EPR, RHSC and B-FCC; it was less-than-adequate for UPE, but close to the recommended threshold. The squared correlations for each pair of factors were less than AVE values. Therefore, discriminant validity was adequate, while convergent validity was not completely satisfactory. The composite reliability (CR) and Cronbach's alpha values were satisfactory. However, the dimension UPE had the lowest reliability.

Following Tylka and Kroon Van Diest (2013) and subsequent studies, a second-order CFA was conducted. The results indicated that the goodness of fit indices was satisfactory: $\chi^2_{85} = 187.04$, $p \cong 0.00$, $\chi^2/df = 2.20$, RMSEA = 0.05, 90 % CI [0.04, 0.06], CFI = 0.96, SRMR = 0.06. However, when the factor loadings were examined, it emerged that B-FCC did not load on the second-order Intuitive Eating factor (λ = 0.02), while the other factors showed significant loadings (EPR = 0.38, RHSC = 0.81, UPE = 0.47, $p_s < 0.001$). Based on these results, we kept the structure with four first-order factors and error covariance between items IES11 and IES2 as a free parameter in the analysis of measurement invariance. Subsequently, we calculated the composite score for each dimension and a total score (3-factor IES-2) considering only the three correlated dimensions (EPR, UPE, and RHSC), which represented the dimensions of the original IES proposed by Tylka (2006).

2.2.3. Gender measurement invariance

Measurement invariance was examined by contrasting male (n = 190) and female (n = 271) participants. Goodness-of-fit statistics of the four-factor model tested separately in men and women are reported in Table 2. Results showed that, for men and women, fit indices were acceptable. The configural invariance was supported. Thereafter, the increasingly constrained models were applied. Although the $\Delta\chi^2$ statistic was significant for metric, scalar and strict invariance, the results referred to ΔCFI, ΔRMSEA, and ΔSRMR did not exceed the established limits, ensuring metric, scalar, strict invariance, and the invariance of the latent variances/covariances by gender.

2.2.4. Gender differences and correlations with BMI

To evaluate the ability of the 15-item IES-2 to differentiate groups in predictable ways, we examined the gender differences associated with the four dimensions of the IES-2 using MANOVA. The main multivariate effect was significant ($F_{4,456} = 7.40$, $p < .001$, $\eta^2_{par} = 0.06$). The only univariate significant effect was for EPR ($F_{1,459} = 28.94$, $p < .001$, $\eta^2_{par} = 0.06$) (medium effect size): men had significantly higher scores (M = 3.34, SD = 1.04) than women (M = 2.86, SD = 0.89) only in the EPR dimension. Furthermore, as for the total 3-factor IES-2 score, the difference between men (M = 3.52, SD = 0.62) and women (M = 3.28, SD = 0.61) was significant ($t_{459} = 4.15$, $p < .001$): men had a higher score than women.

Negative associations, with small/medium effect size (Cohen, 1988), were found for men, women, and total sample between BMI and EPR (men: r = -0.36, $p <$. 01; women r = -0.26, $p < .01$; total sample: r = -0.22, $p < .01$) and RHSC (men: r = -0.26, $p <$. 01; women: r = -0.25, $p < .01$; total sample: r = -0.24, $p < .01$). In the case of men, BMI was negatively associated with B-FCC (r = -0.17, $p < .05$). Also, the correlations between 3-factor IES-2 score and BMI were significant (men: r = -0.38, $p < .001$; women: r = -0.28, $p < .001$; total sample: r = -0.26, $p < .001$).

Table 1
Descriptive statistics, factor loadings and reliability of 15-item IES-2.

Factors and items	*M* (*SD*)	λ	AVE	CR	Alpha
Factor 1: *Eating for Physical Rather Than Emotional Reasons* (EPR)			0.58	0.87	0.87
IES2.I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry. (R) *Mi capita di mangiare quando mi sento in preda a emozioni (ad esempio, quando sono ansioso/a, depresso/a, triste), anche se non sono fisicamente affamato/a.*	2.59 (1.26)	0.78			
IES5. I find myself eating when I am lonely, even when I'm not physically hungry. (R) *Mi capita di mangiare quando mi sento solo/a, anche se non sono fisicamente affamato/a.*	3.09 (1.28)	0.70			
IES10. I use food to help me soothe my negative emotions. (R) *Uso il cibo per aiutarmi a placare le emozioni negative.*	3.20 (1.19)	0.83			
IES11. I find myself eating when I am stressed out, even when I'm not physically hungry. (R) *Mi capita di mangiare quando sono stressato/a, anche se non sono fisicamente affamato/a.*	2.73 (1.23)	0.84			
IES12. I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort. *Sono in grado di affrontare le mie emozioni negative (ad esempio, ansia, tristezza) senza ricorrere al cibo per trovare conforto.*	3.68 (1.06)	0.63			
Factor 2: *Unconditional Permission to Eat* (UPE)			0.43	0.68	0.62
IES3. If I am craving a certain food, I allow myself to have it. *Se mi viene voglia di un certo cibo, mi concedo di mangiarlo.*	3.81 (0.93)	0.76			
IES9. I have forbidden foods that I don't allow myself to eat. (R) *Ci sono dei cibi che considero proibiti e che non mi concedo di mangiare.*	3.64 (1.21)	0.42			
IES16. I allow myself to eat what food I desire at the moment. *Mi concedo di mangiare il cibo che desidero in un certo momento.*	3.91 (0.76)	0.73			
Factor 3: *Reliance on Hunger and Satiety Cues* (RHSC)			0.58	0.85	0.84
IES8. I trust my body to tell me how much to eat. *Confido che sia il mio corpo a dirmi quanto mangiare.*	3.41 (1.00)	0.70			
IES21. I rely on my hunger signals to tell me when to eat. *Mi affido alla mia sensazione di fame per dire a me stesso/a quando mangiare.*	3.43 (0.89)	0.62			
IES22. I rely on my fullness (satiety) signals to tell me when to stop eating. *Mi affido alla mia sensazione di sazietà per dire a me stesso/a quando smettere di mangiare.*	3.60 (0.98)	0.84			
IES23. I trust my body to tell me when to stop eating. *Confido che sia il mio corpo a dirmi quando smettere di mangiare.*	3.42 (0.96)	0.87			
Factor 4: *Body-Food Choice Congruence* (B-FCC)			0.58	0.80	0.78
IES18. Most of the time, I desire to eat nutritious foods.	3.46 (0.89)	0.54			

(*continued on next page*)

Table 1 (*continued*)

Factors and items	*M* (*SD*)	λ	AVE	CR	Alpha
Il più delle volte desidero mangiare cibi nutrienti.					
IES19. I mostly eat foods that make my body perform efficiently (well). *Mangio principalmente cibi che fanno funzionare il mio corpo in modo efficiente (bene).*	3.50 (0.87)	0.92			
IES20. I mostly eat foods that give my body energy and stamina. *Mangio principalmente cibi che danno energia e resistenza al mio corpo.*	3.56 (0.83)	0.78			

Note: Numbers corresponding to the items are from the original list of 23 items (Tylka & Kroon Van Diest, 2013, p.153). Italian translation in italics.

Overall, the 15-item version of the IES-2 showed good psychometric properties in the Italian university students population. In the second study, the psychometric properties of this version of IES-2 were checked in a different sample, along with the relationships with measures of self-esteem, well-being, eating styles and food intake.

3. Study 2

3.1. Materials and methods

3.1.1. Data collection

Participants were initially recruited among students attending Psychology courses at two Italian universities (University of Padua and University of Naples Federico II). Students were asked to personally fill out an online self-report questionnaire created through the Qualtrics platform and to share the link to the survey with more males university students, also employing the social media platforms. The instructions and the consent form were the same as in Study 1. The estimated duration of the task was about 20 min. Overall, 410 university students accessed the online questionnaire, and 364 completed it (88.8 %). To obtain a homogeneous sample, only the participants who declared an age between 18 and 30 years were retained ($n = 359$; final rate: 87.6 %). Data were collected between February and May 2022.

This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving human subjects were approved by the Ethical Committee of Psychological Research of the Department of Humanities of the University of Naples Federico II (prot. n° 33/2021). All participants gave informed consent for joining the research.

3.1.2. Measures

Intuitive Eating Scale-2. The version with 15 items developed in Study 1 was used.

Self-esteem. The Italian version by Bobbio (2009) of the State Self-esteem Scale (Heatherton & Polivy, 1991) was used. This version consists of 14 items representing three factors: Performance, which measures the extent to which one thinks one's general performances are worthy (5 items, e.g., "I feel confident about my abilities"), Social, which measures the extent to which people feel self-conscious, foolish, or embarrassed about their public image (5 items, e.g., "I feel concerned about the impression I am making"; reverse scoring), and Appearance, which is focused on the extent to which people consider their body appearance as good and attractive (4 items, e.g., "I feel satisfied with the way my body looks right now"). The response scale ranged from 1 (completely disagree) to 5 (completely agree). Higher scores describe individuals who think of themselves as effective (Performance) and attractive (Appearance) and are not worried about other people's judgments or about their public image (Social).

Mental Health Continuum (MHC-SF). Participants' well-being was assessed with Mental Health Continuum - Short Form (MHC-SF, Keyes et al., 2008) in its Italian version (Petrillo, Capone, Caso, & Keyes, 2015). It refers to the past month and consists of 14 items with a response scale ranging from 1 (never) to 6 (every time). The scale measures three different dimensions: Emotional Well-being, as defined in terms of positive affect/life satisfaction (3 items, e.g., "During the past month, how often did you feel happy"), Social Well-being, which reflects how well individuals see themselves in terms of social acceptance, social contribution and social integration (5 items, e. g., "During the past month, how often did you feel that you had something important to contribute to society"), and Psychological Well-being, described in terms such as self-acceptance, autonomy, personal growth, positive relations with others (6 items, e.g., "During the past month, how often did you feel that you liked most parts of your personality"). For each dimension, high final scores correspond to a high level of well-being. It is also possible to calculate a total score of mental health.

Dutch Eating Behavior Questionnaire. The Italian adaptation of the French DEBQ short version (Bailly, Maitre, Amanda, Hervé, & Alaphilippe, 2012; Canova, Manganelli, & Bobbio, 2021) was used. This scale contains 16 items rated along a scale ranging from 1 (never) to 5 (very often). Three subscales reflect different eating styles: (a) emotional eating as a response to arousal states (6 items, e.g., "Do you have the desire to eat when you are irritated?"), (b) external eating as eating in response to external food stimuli (5 items, e.g., "Do you eat more than usual, when you see others eating?"), and (c) restrained eating as a restriction of food intake to lose weight or prevent weight gain (5 items, e. g., "Do you deliberately eat foods that are slimming?").

Balanced Inventory of Desirable Responding (BIDR 6). This scale (Paulhus, 1991) detects two main types of socially desirable responding, which refers to the systematic tendency to give overly positive answers that make the respondent look good, known as self-deceptive enhancement (SDE) and impression management (IM). SDE refers to an unconscious tendency to provide honest but positively biased self-reports with the aim of protecting positive self-esteem; IM refers to the habitual and conscious presentation of a favorable public image. We administered the short Italian version elaborated by Bobbio and Manganelli (2011). Both SDE and IM subscale include eight items (for SDE, a sample item is "My first impressions of people usually turn out to be right"; for IM, an example item is "I always obey laws, even if I'm unlikely to get caught"), answered on a 6-point scale from 1 (strongly disagree) to 6 (strongly agree).

Self-reported food intake. By asking *"What types of foods do you usually*

Table 2
Results of multi-group analysis.

Model description	χ^2	*df*	Model comparison	$\Delta\chi^2$ (Δdf)	CFI	ΔCFI	RMSEA	ΔRMSEA	SRMR	ΔSRMR
Men	98.45	83			0.99		0.03		0.06	
Women	146.82	83			0.96		0.05		0.05	
M1 Configural	245.27	166			0.97		0.05		0.05	
M2 Metric	267.41	177	M2 vs M1	22.14* (11)	0.97	0.00	0.05	0.00	0.06	0.01
M3 Scalar	292.73	188	M3 vs M2	25.32* (11)	0.96	0.01	0.05	0.00	0.07	0.01
M4 Strict	324.16	203	M4 vs M3	31.43* (15)	0.96	0.00	0.05	0.00	0.07	0.00
M5 Variances/covariances	336.90	213	M5 vs M4	12.74 (10)	0.95	0.01	0.05	0.00	0.08	0.01

*$p < .05$.

consume and how often?", we presented participants with a list of 21 foods, which was adapted from Camilleri et al. (2017) and Horwath et al. (2019). The response scale ranged from 1 (never) to 5 (very often). For the analyses, foods were grouped into eight categories: 1) meat and protein food (4 items: red meat, poultry, fish, eggs); 2) fruit and vegetables (2 items: vegetables and fresh fruit); 3) salty snacks (2 items: sandwiches/piadina/pizza and chips); 4) sweets (5 items: biscuits, pastry, sweet snacks, chocolate, ice creams and desserts); 5) grain products (2 items: bread/other bakery products and pasta/rice); 6) fast-food (3 items: ready-made/pre-cooked food, frozen food and take-away food); 7) dairy products (2 items: cheese and yoghurt); 8) sausages products (1 item: cold cuts/sausages). These core foods were chosen because their over- or under- consumption is a potential risk factor for developing obesity and severe diseases (Horwath et al., 2019). Average frequency scores were calculated for each food group.

Socio-demographic characteristics included gender, age, geographic area of residence, the university attended, and self-reported height and weight, which were employed to calculate BMI as in Study 1.

3.1.3. Participants

The final sample included 222 women (61.8 %) and 133 men (37 %; 4 missing values). One hundred and sixty-six (46.2 %) were from the University of Naples Federico II, 91 (25.3 %) were from the University of Padua, and 102 (28.4 %) were from other universities in North and South Italy. The percentage of participants who lived in North Italy was equal to 51.8 % ($n = 186$), 47.4 % lived in South Italy ($n = 170$), and 0.8 % lived in Central Italy ($n = 3$). Participants' mean age was 20.35 ($SD = 1.77$, range 18–30). The mean BMI was 22.53 ($SD = 3.49$) (2 missing values). Thirty-five participants (9.7 %) reported an underweight BMI (<18.5), 255 (71 %) reported a normal BMI (between 18.5 and 24.9), 55 (15.3 %) an overweight BMI (between 25 and 29.9), and 12 (3.4 %) reported an obese BMI (>30).

3.1.4. Data analysis

A CFA model (the four-factor model with error covariance for a pair of items, IES2 and IES11) was tested to check the construct validity of the version of the IES-2 with 15 items in a different sample using the same statistical package, analytic procedure and fit indices as those used in Study 1. SPSS 27 was used for descriptive analyses and reliability estimates through Cronbach's alpha, Pearson's correlation coefficients and MANOVA. In addition, Pearson correlation coefficients were used to determine concurrent criterion validity.

3.2. Results

3.2.1. Confirmatory factor analysis

The CFA indicated that the fit indices were satisfactory, similar to Study 1 ($\chi^2_{83} = 154.15$, $p \cong 0.00$, $\chi^2/df = 1.86$, RMSEA = 0.05, 90 % CI: [0.04, 0.06], CFI = 0.96, SRMR = 0.05). The standardized factor loadings (λ) were all statistically significant ($p < .001$). Regarding UPE dimension, the loadings were comprised between 0.47 (IES9) and 0.85 (IES3); for RHSC, the loadings ranged from 0.59 (IES8) to 0.85 (IES23); for EPR, the loadings were comprised between 0.53 (IES12) and 0.80 (IES10); finally, for BFCC the loadings ranged from 0.65 (IES18) to 0.93 (IES19). The correlations between UPE and RHSC ($\phi = 0.48$) and between RHSC and EPR ($\phi = 0.22$) were significant ($p < .001$); the correlation between UPE and EPR ($\phi = 0.08$) was not significant. B-FCC was not correlated with RHSC and EPR; it was negatively correlated with UPE ($\phi = -0.16$, $p < .02$). AVE values were: UPE = 0.50, RHSC = 0.51; EPR = 0.51 and B-FCC = 0.62. All positive square roots of AVE values were higher than the correlations for each pair of factors. CR (comprised between 0.74 and 0.84) and alpha coefficients were satisfactory (between 0.69 and 0.84), and, as in Study 1, the lowest alpha coefficient was that of the UPE subscale. These findings confirmed convergent and discriminant validity of 15-item IES-2 and its reliability.

The results of the second-order analysis indicated that the goodness of fit indices was satisfactory ($\chi^2_{87} = 172.75$, $p \cong 0.00$, $\chi^2/df = 1.99$, RMSEA = 0.05, 90 % CI: [0.04, 0.06], CFI = 0.96, SRMR = 0.07). However, as in Study 1, B-FCC did not load on the second-order Intuitive Eating factor (loading = -0.13, n.s.), while other factors showed significant loadings (RHSC = 0.60, UPE = 0.73, $p_s < 0.001$) and EPR showed a very low loading (EPR = 0.19, $p < .02$). As in Study 1, in the following analysis we kept the structure with four first-order factors and calculated a 3-factor IES-2 score.

3.2.2. Gender differences and correlations with BMI

Multivariate analysis of variance showed that the main multivariate effect of gender was significant ($F_{4,350} = 8.36$, $p < .001$, $\eta^2_{par} = 0.09$). The only significant univariate effect was for EPR ($F_{1,353} = 31.01$, $p < .001$, $\eta^2_{par} = 0.08$): men had significantly higher scores ($M = 3.36$, $SD = 0.86$) than women ($M = 2.85$, $SD = 0.84$) (medium effect size). As in Study 1, the total 3-factor IES-2 score significantly differed ($t_{353} = 3.41$, $p < .001$) among men ($M = 3.48$, $SD = 0.53$) and women ($M = 3.27$, $SD = 0.58$): men had higher score than women. BMI was negatively associated with the EPR subscale in men and women (men: $r = -0.30$, $p < .01$; women: $r = -0.38$, $p < .01$; total sample: $r = -0.27$, $p < .01$) and RHSC subscale (men: $r = -0.19$, $p < .05$; women: $r = -0.15$, $p < .05$; total sample: $r = -0.15$, $p < .01$). In the total sample, BMI was weakly negatively associated with UPE ($r = -0.14$, $p < .01$). The relations were small/moderate in effect size (Cohen, 1988). Finally, the correlations between 3-factor score were significant (men: $r = -0.34$, $p < .001$; women: $r = -0.34$, $p < .001$; total sample: $r = -0.28$, $p < .001$).

3.2.3. Concurrent criterion validity

Table 3 reported alpha coefficients, descriptive statistics of all constructs considered in the study and the correlations with the four subscales of the 15-item version of IES-2 and the 3-factor total score.

The correlations between IES-2 subscales and self-esteem were in the expected direction: individuals with higher scores on EPR and UPE reported considering themselves as quite attractive (Appearance) and effective (Performance) and did not describe themselves as extremely worried about other people's judgments or about their public image (Social). RHSC was positively correlated with Performance and Appearance self-esteem. B-FCC was positively associated with Appearance self-esteem. Coherentely, the 3-factor score IES score also showed positive correlations with all dimensions of self-esteem. The effect size of these correlations was small or medium.

Regarding the three eating styles measured by DEBQ, most of the correlations were negative and significant. Among the single dimensions, the strongest correlations were between EPR and emotional eating and between UPE and restrained eating. Also, RHSC was negatively associated with restrained and emotional eating. Two positive and significant correlations emerged: one between UPE and external eating and one between B-FCC and restrained eating. As for the composite 3-factor score, higher negative correlations emerged with emotional and restrained eating, while the effect size of the negative correlation with external eating was small, albeit still significant.

As regards well-being, significant correlations were positive but small in size. Emotional well-being was positively correlated with all four subscales of the 15-item IES-2 and the 3-factor score. Social well-being was only weakly correlated with EPR and the 3-factor score. Psychological well-being was positively correlated with the 3-factor score, EPR, RHSC and especially with B-FCC.

The correlations with the two dimensions of social desirability were not significant or very small in size. The positive and significant correlations regarded the B-FCC and EPR subscales. Noteworthy was, however, the correlation between B-FCC and IM: claiming to make nutritious and healthy food choices was weakly associated with impression management strategies. The 3-factor score, instead, only showed a small positive correlation with SDE.

Table 3
Reliability, descriptive statistics of all constructs and correlations with the four factors of 15-item IES-2 and 3-factor IES-2 score ($n = 359$).

Constructs/Factors	Alpha	*M (SD)*	EPR	UPE	RHSC	B-FCC	3-factor IES-2 score
Self-esteem							
Performance [a]	0.81	3.35 (0.75)	0.30**	0.25**	0.19**	0.10	0.36**
Social [a]	0.85	2.67 (0.89)	0.24**	0.13*	0.09	0.07	0.24**
Appearance [a]	0.85	3.02(0.87)	0.32**	0.32**	0.30**	0.17**	0.45**
DEBQ							
Emotional eating [a]	0.91	2.44 (0.93)	-0.78**	-0.11*	-0.18**	-0.11*	-0.62**
Restrained eating [a]	0.84	2.77 (0.95)	-0.19**	-0.61**	-0.31**	0.24**	-0.47**
External eating [a]	0.71	3.24 (0.66)	-0.26**	0.25**	-0.04	-0.08	-0.10*
MHC							
Emotional well-being [b]	0.83	3.87 (1.08)	0.14**	0.11*	0.12*	0.20**	0.18**
Social well-being [b]	0.74	2.69 (0.99)	0.18**	0.08	0.08	0.10	0.18**
Psychological well-being [b]	0.84	4.03 (1.06)	0.15**	0.09	0.11*	0.25**	0.18**
Total MHC [b]	0.90	3.51 (0.91)	0.18**	0.10*	0.12*	0.22**	0.20**
Social desirability							
SDE [b]	0.73	3.75 (0.76)	0.12*	0.04	0.06	0.16**	0.12*
IM [b]	0.70	3.48 (0.82)	0.09	-0.06	0.05	0.20**	0.06

Note: [a] = response scale 1–5; [b] = response scale 1–6. DEBQ = *Dutch Eating Behavior Questionnaire;* MHC = *Mental Health Continuum (MHC-SF)*; SDE = *Self-Deceptive Enhancement;* IM = *Impression Management*; EPR = *Eating for Physical Rather Than Emotional Reasons;* UPE = *Unconditional Permission to Eat;* RHSC = *Reliance on Hunger and Satiety Cues;* B-FCC = *Body-Food Choice Congruence;* 3-factor IES-2 score = *composite score encompassing EPR, UPE, and RHSC.* * $p < .05$, ** $p < .01$.

3.2.4. Relationships between intuitive eating dimensions and food intake

Table 4 reports the correlations of IES-2 subscales and 3-factor total score with the eight food groups. The correlations were computed for the whole sample and for men and women separately.

The EPR subscale showed only a few significant correlations with food intake. For all participants, it was inversely and weakly associated with the consumption of sweets and fast food. Overall, it was unrelated or weakly related to diet quality. The UPE subscale showed, in the total sample, a small negative correlation with fruit and vegetable intake and moderate positive correlations with the intake of sweets, salty snacks and sausages products. This dimension also showed positive but small correlations with grains and fast food intake. Men and women showed a similar pattern of relationships. Hence, individuals with high scores on UPE showed poor diet quality. Regarding RHSC, in all participants, we found small positive correlations with grains products, sausages products, sweets and salty snacks, and a negative correlation with fruit and vegetable intake. B-FCC, in the total sample, showed a moderate positive correlation with fruit and vegetable intake and a small correlation with dairy products, as well as negative correlations with the consumption of salty snacks, sweets, fast food, and sausages. Once more, men and women showed a similar pattern of relationships with food consumption. Hence, the B-FCC dimension emerged as the one mostly associated with a tendency to avoid unhealthy food choices and prefer a healthy diet. Coherently, the 3-factor score showed a pattern of positive association with the consumption of salty snacks, grains, sausages and sweets. On the contrary, it was negatively correlated with the consumption of fruit and vegetables in all considered groups.

4. Discussion

The present study aimed to validate an Italian version of the IES-2 for university students, exploring its psychometric features. To achieve this

Table 4
Food intake, means, standard deviation, and correlations with IES-2 subscales and 3-factor IES-2 score.

Food groups	***M (SD)*** ***n = 359***	**Correlations**				
		EPR	UPE	RHSC	B-FCC	3-factor IES-2 score
Protein food	*3.37 (0.67)*	All = 0.02	All = -0.01	All = -0.03	All = 0.03	All = 0.00
		M = 0.12	M = 0.00	M = -0.07	M = -0.01	M = 0.05
		W = -0.08	W = 0.01	W = -0.02	W = 0.04	W = -0.05
Fruit and vegetables	*3.83 (0.89)*	All = -0.10	All = -0.22**	All = -0.14**	All = 0.42**	All = -0.20**
		M = 0.01	M = -0.31**	M = -0.28**	M = 0.40**	M = -0.22**
		W = -0.14*	W = -0.20**	W = -0.08	W = 0.43**	W = -0.19**
Salty snacks	*3.20 (0.78)*	All = -0.06	All = 0.41**	All = 0.11*	All = -0.39**	All = 0.15**
		M = -0.13	M = 0.44**	M = 0.25**	M = -0.32**	M = 0.18*
		W = -0.01	W = 0.40**	W = 0.04	W = -0.42**	W = 0.15*
Sweets	*2.70 (0.73)*	All = -0.12*	All = 0.40**	All = 0.13*	All = -0.27**	All = 0.11*
		M = -0.16	M = 0.40**	M = 0.26**	M = -0.31**	M = 0.14
		W = -0.09	W = 0.39**	W = 0.05	W = -0.25**	W = 0.11
Grains	*4.23 (0.64)*	All = 0.01	All = 0.20**	All = 0.22**	All = -0.10	All = 0.17**
		M = -0.07	M = 0.26**	M = 0.13	M = -0.01	M = 0.10
		W = 0.00	W = 0.18**	W = 0.26**	W = -0.16*	W = 0.18**
Fast food	*2.56 (0.74)*	All = -0.14**	All = 0.15**	All = 0.03	All = -0.26**	All = -0.03
		M = -0.13	M = 0.08	M = 0.08	M = -0.34**	M = -0.03
		W = -0.16*	W = 0.19**	W = 0.00	W = -0.22**	W = -0.03
Dairy products	*3.24 (0.87)*	All = 0.02	All = -0.06	All = 0.06	All = 0.21**	All = 0.01
		M = 0.16	M = 0.07	M = 0.06	M = 0.14	M = 0.16
		W = -0.12	W = -0.13*	W = 0.05	W = 0.24**	W = -0.10
Sausages products	*3.19 (0.97)*	All = 0.07	All = 0.33**	All = 0.19**	All = -0.35**	All = 0.24**
		M = -0.10	M = 0.27**	M = 0.24**	M = -0.30**	M = 0.13
		W = 0.10	W = 0.37**	W = 0.17**	W = -0.38**	W = 0.26**

Note: response scale 1 (never) − 5 (very often). All: $n = 359$; Men: $n = 133$; Women: $n = 222$. EPR = *Eating for Physical Rather Than Emotional Reasons;* UPE = *Unconditional Permission to Eat;* RHSC = *Reliance on Hunger and Satiety Cues;* B-FCC = *Body-Food Choice Congruence;* 3-factor IES-2 score = *composite score encompassing EPR, UPE, and RHSC.* * $p < .05$, ** $p < .01$.

aim, we conducted two studies on two different samples involving a total number of 820 Italian university students. The Italian version of IES-2 used in this research was translated and adapted independently from the other Italian version recently validated for the general Italian population (Swami et al., 2021). However, the two versions are very similar in items meaning and wording. Our results confirmed, across the two samples, the four-factor structure of IES-2, although some post-hoc model modifications were required to achieve a good fit for our data. As in previous studies (e.g., Akırmak et al., 2021; Camilleri et al., 2015; Małachowska & Jeźewska-Zychowicz, 2022; Saunders et al., 2018; Swami et al., 2020; Vintilă et al., 2020), some items were removed (three from the EPR dimension, three from the UPE dimension and two from RHSC), and error covariance of a pair of items was allowed. All items within our final model loaded into the same factors as in the original IES-2. The final 15-item scale showed a satisfactory convergent and discriminant validity, although the UPE dimension showed, only in Study 1, a low AVE value. Nevertheless, previous adaptations of the scale have reported some cases of less-than-adequate AVE values (e.g., Swami et al., 2020; Vintilă et al., 2020). As for the scale's internal consistency and reliability, all indices were satisfactory even though the UPE dimension, coherently with previous studies, showed the lowest reliability (e.g., Horwath et al., 2019).

Evidence of a second-order intuitive eating factor was not found. Further, as in previous studies (e.g., Van Dyck et al., 2016; Carbonneau et al., 2016; Horwath et al., 2019), B-FCC was not or weakly related to all or some other IES-2 dimensions. Our results suggest caution when calculating a total IES-2 score because at least one dimension was unrelated to the higher-order factor and the other dimensions of IES-2 in two different samples. Instead, we calculated a total score considering only the three correlated dimensions reflecting the scale version of Tylka (2006) – namely EPR, UPE, and RHSC. The multi-group analysis confirmed the measurement invariance across gender of the four first-order factors structure.

Comparing our results and those obtained by Swami et al. (2021) in the Italian context, we can point out some similarities despite differences in the sample composition (under 30 university students vs adults from the general population). In both cases, the Italian version could be conceptualized as a 4-factor model, which was identical to the parent model (Tylka & Kroon Van Diest, 2013) and invariant across gender. The most important difference regarded the estimation of an intuitive eating global factor, which in our study was defined by the three dimensions of IES (Tylka, 2006), whereas in Swami et al. (2021) was represented by the G-factor in a B-ESEM framework. This difference could be due to the different analytic approaches adopted in the two studies.

As for the relationships between the scale's four dimensions and gender, the results across the two studies confirmed a difference in the EPR dimension, as men more than women appear to eat for physical rather than emotional reasons. This result is in line with both previous validations of the IES-2 (e.g., Camilleri et al., 2015; Carbonneau et al., 2016; Horwath et al., 2019; Ruzanska & Warschburger, 2017; Van Dyck et al., 2016) and the literature about the diffusion of emotional eating style, which, in fact, showed its higher diffusion among women rather than men (Thompson & Romeo, 2015). One possible interpretation of such a replicated result could lie in the different cultural pressures that males and females face (Schettino, Fabbricatore, & Caso, 2022). Notably, it is not a secret that Western cultures have encouraged women more than men to pursue a body ideal of thinness (Thompson & Romeo, 2015), and this could have led women to trust their internal physical signals to a lesser extent (Tylka & Kroon Van Diest, 2013). This result is also reflected in the 3-factor total score, concerning which men had a higher score than women.

About the relationship with the BMI, our results supported a negative correlation with the 3-factor IES-2 score and, particularly, two subscales, namely EPR and RHSC, suggesting that this index tends to decrease with a higher tendency to eat for physical rather than emotional reasons and rely on hunger and satiety cues for guiding the eating behaviors. This finding is in line with those studies that found a negative relationship between the overall intuitive eating score and the BMI (see Linardon et al., 2021), and partially replicates the results of other authors (e.g., Swami et al., 2021; Van Dyck et al., 2016) which also observed a negative correlation with B-FCC, although very weak. No inferences regarding the direction of these cross-sectional relationships can be made. Indeed, those who eat intuitively may be better able to regulate the quality and quantity of foods consumed and less likely to consume excess calories through bouts of overeating than those who follow restrictive diets. Alternatively, it could also be plausible that individuals with a lower BMI experience fewer concerns with their body image and desire to control their weight, showing a higher tendency to honour their hunger and satiety cues (Linardon et al., 2021). However, the remarkable consistency in the literature of negative relations between intuitive eating and BMI seems to suggest that, rather than being associated with an increase in body weight, intuitive eating is linked to lower BMI, even in the absence of a rigidly planned diet (Tribole & Resch, 2003; Tylka & Kroon Van Diest, 2013).

Regarding the association with social desirability, as in the parent study by Tylka and Kroon Van Diest (2013), the scores of four dimensions and the 3-factor score were unrelated or weakly related to the dimensions of the social desirability measure, additionally supporting the discriminant validity of IES-2, since social desirability did not overlap substantially with most participants' answers.

The concurrent criterion validity of the 15-item scale can be considered achieved. In order to investigate it, we explored the correlations among the four dimensions and self-esteem, well-being and the three eating styles proposed by van Strien et al. (1986). Results confirmed the expected relationships. In particular, as the 3-factor IES-2 score, EPR and UPE positively correlated with all three aspects of self-esteem (Appearance, Performance and Social), while RHSC was positively and significantly correlated only with Performance and Appearance. B-FCC, instead, only correlated with Appearance. The positive correlations with self-esteem are coherent with literature (e.g., Akırmak et al., 2021; Swami et al., 2021; Tylka & Kroon Van Diest, 2013). Note that the strongest correlations involved the Appearance dimension: individuals with higher scores on the IES-2 dimensions had lower body image concerns and considered their body appearance as good and attractive (e.g., Carbonneau et al., 2016; Swami et al., 2020; Swami et al., 2021). These findings further underline the adaptive role of intuitive eating, especially for what concerns body appreciation. Coherently, we also found associations between the 3-factor IES-2 score and all IES-2 subscales and Emotional well-being, as well as between EPR, RHSC and especially B-FCC and Psychological well-being.

Regarding intuitive eating and eating styles measured by DEBQ, as in previous studies (e.g., Barrada et al., 2020; Ruzanska & Warschburger, 2017; Van Dyck et al., 2016), we found strong negative correlations between emotional eating and EPR and between restrained eating and UPE. Moreover, RHSC was also negatively correlated to restrained eating, which is also coherent with previous studies (e.g., Tylka, 2006) and with emotional eating (in line with Román et al., 2021). This last association implies that individuals who listen to their bodies' cues about when and how much to eat are less prone to eat in response to negative emotions when not hungry. These negative associations with the emotional and restrained eating styles can be framed in the light of the initial conceptualization of the EPR, UPE and RHSC subscales aimed at capturing opposite and adaptive tendencies (Tylka, 2006). This expected result, which is also reflected in the negative association that emerged between the 3-factor IES-2 score and all maladaptive eating styles, supports the idea that, while intuitive eating is more than just the opposite of emotional, restrictive, and external eating, it is still effectively contraposed to them. Regarding positive associations, UPE emerged as significantly correlated with external eating. To eat in response to environmental food cues, such as the sight and smell of food, is positively associated with eating foods desired at the moment and refusing to label certain foods as forbidden. This could probably be due

to the fact that the refusal to label certain foods as forbidden and the tendency to satisfy the moment's desire can sometimes imply indulging in whims prompted by food-related external stimuli. We also found a positive correlation between restrained eating and B-FCC. Restrained eating, which reflects the degree of conscious food restriction to lose or maintain a particular weight, is positively associated with making food choices that honor health and body functioning. This result could suggest that, in participants' perception, the drive to honor their health and body functioning, choosing nutritious foods promoting energy, stamina, and body performance, is somewhat still linked to a tendency to limit food consumption consciously. Despite some literature about restrained eating suggesting that it may still present an adaptive component related to the active attempt to maintain optimal body weight (e.g., de Lauzon-Guillain, et al., 2006), this result seems still closely related to cultural standards according to which a performing body is predominantly thin (Schaefer, Burke, & Thompson, 2019) and that, to maintain it so, it is necessary to abstain from eating certain foods, in order not to gain weight.

The 15-item Italian version of the IES-2 is a psychometrically sound measure which could be proficiently employed to investigate the intuitive eating dimensions in the Italian university students' population. Furthermore, having a brief version of IES-2 can be an advantage due to the opportunity to administer a more parsimonious measure for both clinical and non-clinical assessments. As an example, time is saved regarding administration, application and scoring, and the monitoring of treatment outcomes may become more efficient (Machado, Grilo, Rodrigues, Vaz, & Crosby, 2020).

The last aim of the second study was to analyze the relationship between intuitive eating and food intake. As we said above, intuitive eating is considered an important non-dieting approach to promoting healthy eating and a good relationship with food. Thus, this approach might improve dietary intake and/or eating behaviors. However, in the literature, the evidence for this contention is mixed. Our analyses of the relationships between the four dimensions of IES-2 and food consumption revealed many associations, which are also reported in previous studies.

First, the B-FCC dimension was the most closely related to the ability to select foods that meet nutrition-related needs, as the few studies which considered the relation between this dimension and food intake have shown (Barad et al., 2019; Małachowska & Jeżewska-Zychowicz, 2022). These results support the original conception of this aspect of intuitive eating by Tribole and Resch (2003), which refers to making food choices that honor health and body functioning, as well as tasting good. On the contrary, the 3-factor IES-2 score emerged as positively correlated with makers of an unhealthy diet, such as salty snacks, sweets, and sausages, and negatively correlated with healthy food consumption (i.e., fruit and vegetables). In particular, RHSC was not associated with higher diet quality as it correlated positively with the intake of sausage products, sweets, and salty snacks, especially in men, and grain products, especially in women, and negatively with fruit and vegetable intake, especially in men. These results are in line with Małachowska and Jeżewska-Zychowicz (2022) and in contrast with Camilleri et al. (2017) and Horwath et al. (2019). RHSC dimension is characterized by eating in response to internal hunger and satiety cues, but past food experiences may disrupt this ability. For example, unbalanced parental feeding practices in childhood might push children to consume unhealthy instead of healthy foods in response to cues of hunger or to assume more food than the body needs, thus contributing to the formation of less favourable eating habits (Małachowska & Jeżewska-Zychowicz, 2022). Feeding practices and expectations established in childhood typically persist into adulthood. Thus, our findings may be due to the influence of previous individuals' experiences, yet such factors were not included in our study. UPE showed, in men and women, small negative correlations with fruit and vegetable intake and moderate positive correlations with the consumption of salty snacks, sweets and sausages products. Previous studies on intuitive eating also found a significant relationship between UPE and a greater intake of sweets and salty snacks (Barad et al., 2019; Camilleri et al., 2017; Horwath et al., 2019). Hence, unconditional permission to eat high scores were associated with poorer diet quality, and, as Camilleri et al. (2017) point out, the UPE dimension may not positively impact diet without concurrent health awareness. The relations between EPR and food intake were weak. Considering the whole sample, people who ate for physical rather than emotional reasons consumed less sweets and fast food. Thus, the positive association between intuitive eating and higher dietary quality was confirmed for B-FCC and only partially for EPR.

In conclusion, as previous research, this study confirmed that intuitive eating, in the Italian university students population, is associated with a healthier psychological status and lower risk of high weight status and that it can be considered an adaptive eating behavior, but it is not consistently associated with all markers of a healthy diet (Jackson et al., 2022).

Turning to the potential practical implications of our research, the results suggest that the interventions aiming to increase intuitive eating practices should focus on eating for physical rather than emotional reasons and choosing food in congruence with the body's needs. Interventions that aim to improve reliance on hunger and satiety cues should be accompanied by strategies that aim to improve diet quality, health, beliefs, and habits related to food.

Some limitations of the studies reported in this paper should be noted. First, we used two convenience samples of university students where women were overrepresented. Also, we had not included an appropriate response option suitable for gender-diverse people, as the provided response options were *men*, *women*, and *I prefer not to answer*. Further research is needed with diverse and more representative samples. Second, correlations between intuitive eating and food intake were examined only with selected food groups, and the employed items did not capture individual variations in portion sizes. A more rigorous assessment of dietary intake is needed to test the relationship between intuitive eating and alignment with biological requirements. Furthermore, it is worth remembering that our data were collected during the COVID-19 pandemic. It is difficult to know how both pandemic and lockdown measures have impacted our results, although it is important to note that other studies in Italy have shown that lockdown conditions increased indices of emotional eating and the use of food to manage distress (e.g., Cecchetto, Aiello, Gentili, Ionta, & Osimo, 2021). Finally, the studies were limited by their cross-sectional nature. Prospective studies are needed to assess the long-term relationship between intuitive eating, psychological variables, and food intake.

Future studies might also provide further evidence for the soundness of the brief Italian version of IES-2, for example, with analyses of test–retest reliability or sensitivity to change. Examining intuitive eating in representative samples or different age groups could further enhance the generalizability of our findings, as university students' eating habits might differ from those of people of different ages.

5. Conclusions

The current research showed that the proposed Italian 15-item version of the IES-2 has adequate psychometric properties and can be used to assess intuitive eating among Italian university students. Results from two distinct samples supported the four-factor structure of the IES-2, but evidence of a second-order intuitive eating factor was not found, as one dimension (B-FCC) did not load on this higher-order factor. To compute a total score of intuitive eating, the three correlated dimensions (EPR, UPE, and RHSC), which represented the dimensions of the original IES proposed by Tylka (2006), were considered. Our findings supported the adaptive traits of intuitive eating, as it appeared to be positively associated with measures of psychosocial adaptation and negatively correlated with maladaptive eating styles. However, only B-FCC was associated with markers of a healthy diet, while the other dimensions showed positive associations with the consumption of unhealthy food or

were not related to food choices.

Ethical statement

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving human subjects were approved by the Ethical Committee of Psychological Research of the Department of Humanities of the University of Naples Federico II (prot. n° 33/2021). Firstly, participants were requested to read an instruction paragraph where they were made familiar with the aim of the study, the estimated duration of the task, and the possibility of withholding their consent to participate at any time; they were also assured that all answers would have remained confidential. Then they provide their informed consent (by clicking the "I accept" button on the questionnaire Web page).

CRediT authorship contribution statement

Luigina Canova: Writing – review & editing, Writing – original draft, Visualization, Software, Methodology, Investigation, Formal analysis, Conceptualization. **Daniela Caso:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Marcella Bianchi:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Data curation, Conceptualization. **Miriam Capasso:** Writing – review & editing, Methodology, Investigation, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgments

This research received no specific grant from any funding agency.

References

Akırmak, Ü., Bakıner, E., Boratav, H. B., & Güneri, G. (2021). Cross-cultural adaptation of the intuitive eating Scale-2: Psychometric evaluation in a sample in Turkey. *Current Psychology, 40*, 1083–1093. https://doi.org/10.1007/s12144-018-0024-3

Altheimer, G., & Urry, H. L. (2019). Do emotions cause eating? the role of previous experiences and social context in emotional eating. *Current Directions in Psychological Science, 28*(3), 234–240. https://doi.org/10.1177/0963721419837685

Bailly, N., Maitre, I., Amanda, M., Hervé, C., & Alaphilippe, D. (2012). The dutch eating behaviour questionnaire (DEBQ). assessment of eating behaviour in an aging french population. *Appetite, 59*, 853–858. https://doi.org/10.1016/j.appet.2012.08.029

Barad, A., Cartledge, A., Gemmill, K., Misner, N. M., Santiago, C. E., Yavelow, M., & Langkamp-Henken, B. (2019). Associations between intuitive eating behaviors and fruit and vegetable intake among college students. *Journal of Nutrition Education and Behavior, 51*, 758–762. https://doi.org/10.1016/j.jneb.2019.03.010

Barrada, J. R. C., & van Strien, B. (2020). Intuitive eating a novel eating style? evidence from a spanish sample. *European Journal of Psychological Assessment, 36*, 19–31. https://doi.org/10.1027/1015-5759/a000482

Bobbio, A. (2009). Relation of physical activity and self-esteem. *Perceptual and Motor Skills, 108*, 549–555. https://doi.org/10.2466/pms.108.2.549-557

Bobbio, A., & Manganelli, A. M. (2011). Measuring social desirability responding. a short version of paulhus' BIDR 6. *Testing Psychometrics Methodology in Applied Psychology, 18*, 117–135. https://doi.org/10.4473/TPM.18.2.4

Camilleri, G. M., Méjean, C., Bellisle, F., Andreeva, V. A., Kesse-Guyot, E., & Hercberg, S. (2017). Intuitive eating dimensions were differently associated with food intake in the general population- based NutriNet-sant_e study. *The Journal of Nutrition, 147*, 61–69.

Camilleri, G. M., Méjean, C., Bellisle, F., Andreeva, V. A., Sautron, V., Hercberg, S., & Pénaux, S. (2015). Cross-cultural validity of the intuitive eating scale-2: Psychometric evaluation in a sample of the general french population. *Appetite, 84*, 34–42. https://doi.org/10.1016/j.appet.2014.09.009

Canova, L., Manganelli, A. M., & Bobbio, A. (2021, August). Snack Consumption among Young People. Eating Style and the Theory of Planned Behavior. Poster session presentation at the 35th Annual Conference of the European Health Psychology Society - EHPS 2021, Virtual event.

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

Caso, D., Capasso, M., Fabbricatore, R., & Conner, M. (2020). Unhealthy eating and academic stress: The moderating effect of eating style and BMI. *Health psychology open, 7*(2), Article 2055102920975274. https://doi.org/10.1177/2055102920975274

Cecchetto, C., Aiello, M., Gentili, C., Ionta, S., & Osimo, S. A. (2021). Increased emotional eating during COVID-19 associated with lockdown psychological and social distress. *Appetite, 160*, Article 105122. https://doi.org/10.1016/j.appet.2021.105122

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 14*, 464–504. https://doi.org/10.1080/10705510701301834

Choi, J. (2020). Impact of stress levels on eating behaviors among college students. *Nutrients, 12*, 1241. https://doi.org/10.3390/nu12051241

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Erlbaum.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*, 39–50. https://doi.org/10.1177/002224378101800104

Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology, 60*, 895–910. https://doi.org/10.1037/0022-3514.60.6.895

Horwath, C., Hagmann, D., & Hartmann, C. (2019). Intuitive eating and food intake in men and women: Results from the swiss food panel study. *Appetite, 135*, 61–71. https://doi.org/10.1016/j.appet.2018.12.036

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

Jackson, A., Sano, Y., Parker, L., Cox, A. E., & Lanigan, J. (2022). Intuitive eating and dietary intake. *Eating Behaviors, 45*, Article 101606. https://doi.org/10.1016/j.eatbeh.2022.101606

Keyes, C. L. M., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., & Rooy, S. (2008). Evaluation of the mental health continuum-short form (MHC–SF) in setswana-speaking south africans. *Clinical Psychology and Psychotherapy, 15*, 181–192. https://doi.org/10.1002/cpp.572

Lauzon-Guillain, B., Basdevant, A., Romon, M., Karlsson, J., Borys, J.-M., Charles, M. A., & Group, T. Flvss. (2006). Is restrained eating a risk factor for weight gain in a general population? The American Journal of Clinical Nutrition, 83, 132–138. 10.1093/ajcn/83.1.132.

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

Machado, P. P. P., Grilo, C. M., Rodrigues, T. F., Vaz, A. R., & Crosby, R. D. (2020). Eating disorder examination questionnaire short forms: A comparison. *International Journal of Eating Disorders, 53*, 937–944. https://doi.org/10.1002/eat.23275

Małachowska, A., & Jeżewska-Zychowicz, M. (2022). Polish adaptation and validation of the intuitive (IES-2) and mindful (MES) eating scales-the relationship of the concepts with healthy and unhealthy food intake (a cross-sectional study). *Nutrients, 14*, 1109. https://doi.org/10.3390/nu14051109

Nolan, L. J., & Geliebter, A. (2012). Night eating is associated with emotional and external eating in college students. *Eating Behaviors, 13*(3), 202–206. https://doi.org/10.1016/j.eatbeh.2012.02.002

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17–59). Academic Press. https://doi.org/10.1016/B978-0-12-590241-0.50006-X.

Petrillo, G., Capone, V., Caso, D., & Keyes, C. L. (2015). The mental health continuum-short form (MHC–SF) as a measure of well-being in the italian context. *Social Indicators Research, 121*, 291–312. https://doi.org/10.1007/s11205-014-0629-3

Polivy, J., & Herman, C. P. (2020). Overeating in restrained and unrestrained eaters. *Frontiers in Nutrition, 7*, 30. https://doi.org/10.3389/fnut.2020.00030

Poobalan, A. S., Aucott, L. S., Clarke, A., & Smith, W. C. S. (2014). Diet behaviour among young people in transition to adulthood (18–25 year olds): A mixed method study. *Health Psychology and Behavioral Medicine, 2*, 909–928. https://doi.org/10.1080/21642850.2014.931232

Ramalho, S. M., Saint-Maurice, P. F., Félix, S., & Conceição, E. (2022). Intuitive eating Scale-2: Factor structure and associations with disordered eating, impulsivity and quality of life in adolescents with overweight/ obesity. *Eating Behaviors, 44*, Article 101593. https://doi.org/10.1016/j.eatbeh.2021.101593

Román, N., Rigób, A., Gajdos, P., Tóth-Királyc, T., & 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

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

Ruzanska, U. A., & Warschburger, P. (2020). How is intuitive eating related to self-reported and laboratory food intake in middle-aged adults? *Eating behaviors, 38*, Article 101405. https://doi.org/10.1016/j.eatbeh.2020.101405

Saunders, J. F., Nichols-Lopez, K. A., & Frazier, L. D. (2018). Psychometric properties of the intuitive eating Scale-2 (IES-2) in a culturally diverse hispanic american sample. *Eating Behaviors, 28*, 1–7. https://doi.org/10.1016/j.eatbeh.2017.11.003

Schaefer, L. M., Burke, N. L., & Thompson, J. K. (2019). Thin-ideal internalization: How much is too much? eating and weight disorders—Studies on anorexia. *Bulimia and Obesity, 24*, 933–937. https://doi.org/10.1007/s40519-018-0498-x

Schettino, G., Fabbricatore, R., & Caso, D. (2022). To be yourself or your selfies, that is the question": The moderation role of gender, nationality, and privacy settings in the relationship between selfie-engagement and body shame. *Psychology of Popular Media, 12*, 268. https://doi.org/10.1037/ppm0000417

Swami, V., Maïano, C., Furnham, A., & Robinson, C. (2021). The intuitive eating Scale-2: Re-evaluating its factor structure using a bifactor exploratory structural equation modelling framework. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, 27*, 1349–1357. https://doi.org/10.1007/s40519-021-01271-9

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*, Article 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

Thompson, S., & Romeo, S. (2015). Gender and racial differences in emotional eating, food addiction symptoms, and body weight satisfaction among undergraduates. *Journal of Diabetes and Obesity, 2*, 1–6. https://doi.org/10.15436/2376-0494.15.035

Tribole, E., & Resch, E. (2003). *Intuitive eating. a revolutionary program that works* ((2nd ed.).). St. Martin's Griffin.

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

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

Van Dyck, Z., Herbert, B. M., Happ, C., Kleveman, G. V., & Vögele, C. (2016). German version of the intuitive eating scale: Psychometric evaluation and application to an eating disordered population. *Appetite, 105*, 798–807. https://doi.org/10.1016/j.appet.2016.07.019

van Strien, T., Frijters, J. E. R., Bergers, G. P. A., & Defares, P. B. (1986). The dutch eating behavior questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders, 5*, 295–315. https://doi.org/10.1002/1098-108X(198602)5:2

Vélez-Toral, M., Rodríguez-Reinado, C., Ramallo-Espinosa, A., & Andrés-Villas, M. (2020). It's important but, on what level?": Healthy cooking meanings and barriers to healthy eating among university students. *Nutrients, 12*, 2309. https://doi.org/10.3390/nu1208230

Vintilă, M., Todd, J., Goian, C., Tudorel, O., Barbat, C. A., & Swami, V. (2020). The romanian version of the intuitive eating Scale-2: Assessment of its psychometric properties and gender invariance in romanian adults. *Body Image, 35*, 225–236. https://doi.org/10.1016/j.bodyim.2020.09.009

World Health Organization. (2000). Obesity: Preventing and Managing the Global Epidemic. Report of a WHO consultation [WHO Technical Report Series.]. World Health Organization. https://apps.who.int/iris/handle/10665/42330.

Yong, C., Liu, H., Yang, Q., Luo, J., Ouyang, Y., Sun, M., … Lin, Q. (2021). The relationship between restrained eating, body image, and dietary intake among university students in China: A cross-sectional study. *Nutrients, 13*, 990. https://doi.org/10.3390/nu13030990