Original Article

Intuitive Eating

A Novel Eating Style? Evidence From a Spanish Sample

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Abstract: Intuitive eating is defined as an adaptive way of eating that maintains a strong connection with the internal physiological signs of hunger and satiety. It has four elements: unconditional permission to eat whenever and whatever food is desired, eating for physical rather than for emotional reasons, reliance on hunger and satiety cues to determine when and how much to eat, and body-food choice congruence. In this study, we assessed the differences and similarities between intuitive eating, as measured with the Intuitive Eating Scale-2 (IES-2), and eating styles (restrained, emotional, and external eating), assessed with the Dutch Eating Behavior Questionnaire (DEBQ). Using a Spanish sample of mainly university students (n = 1,095) we found that (a) unconditional permission to eat presented a large negative correlation with restrained eating, r = −.82; (b) eating for physical reasons had a large negative correlation with emotional eating, r = −.70; (c) the dimensions of intuitive eating only showed very small correlations with positive and negative affect, satisfaction with life, body dissatisfaction or weight control behavior after restrained, emotional, and external eating had been partialled out. Altogether, the present results suggest that two of the dimensions of intuitive eating as assessed with the IES-2 are not very new or innovative. The most promising new dimension of intuitive eating seems to be body-food choice congruence.

Keywords: intuitive eating, eating styles, validation, DEBQ, IES-2

Eating behavior has commonly been studied from a negative point of view (e.g., Tylka & Wilcox, 2006) with the use of words like risk factors, disordered eating, illness or pathology (i.e., Striegel-Moore & Bulik, 2007). Recently, an entirely different approach has emerged: *Health At Every Size* (HAES; Bombak, 2014; Miller, 2005). HAES focuses on health and adaptation, in contrast to weight maintenance or loss of body weight, and supports the dependency on internal processes of regulation of hunger and satiety (Bacon & Aphramor, 2011).

A core concept of HAES is *intuitive eating*, defined as an adaptive way of eating that maintains a strong connection with the internal physiological signs of hunger and satiety (Tribole & Resch, 1995; Tylka, 2006). Intuitive eating has three main elements, namely: (a) *unconditional permission to eat* when hungry and to eat whatever food is desired, (b) *eating for physical rather than emotional reasons*, and (c) *reliance on internal hunger and satiety cues* to determine when and how much to eat. People who engage in intuitive eating are both well aware of their internal signals of hunger and satiety and trust these signals to guide their eating behavior (Tribole & Resch, 1995). According to Tylka (2006), adaptive eating (of which intuitive eating is one of the facets) is more than the absence of a preoccupation with food, binge eating, and dietary restriction: "Adaptive eating may be negatively related to but not solely defined by the absence of eating disorder symptoms" (p. 226). So, intuitive eating is supposed to be a new eating style which should be considered in addition to other more pathology-focused eating styles (Tylka, 2006).

Intuitive eating has been related to several relevant constructs associated with eating behavior and body image: negatively, with body mass index (BMI; Gast, Madanat, & Campbell Nielson, 2012; Smith & Hawks, 2006; Tylka, 2006), dieting behavior (Denny, Loth, Eisenberg, & Neumark-Sztainer, 2013), eating disorder symptomatology (Tylka & Wilcox, 2006), body dissatisfaction, and internalization of the thin ideal (Augustus-Horvath & Tylka, 2011; Tylka, 2006); and positively, with well-being (Tylka & Wilcox, 2006). A recent review of psychosocial correlates of intuitive eating among adult women can be found in Bruce and Ricciardelli (2016).

At face value, the three dimensions of intuitive eating seem to resemble the already described eating styles of restrained eating (eating less than desired to maintain or lose body weight), emotional eating (the desire to eat in response to negative emotions), and external eating (eating in response to sensory cues – sight, smell, and taste of food – regardless of internal signals of hunger or satiety; van Strien, Frijters, Bergers, & Defares, 1986). All three

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dimensions of intuitive eating can be conceptualized as the opposite pole of these existing eating styles: (a) Unconditional permission to eat seems to be the reverse of restrained eating; (b) eating for physical rather than for emotional reasons can be considered the opposite of emotional eating; and (c) reliance on hunger satiety cues can be considered to be similar, although in the opposite direction, to external eating. This possible overlap casts doubts about the appropriateness of developing a new theoretical framework (intuitive eating) and questionnaire (Intuitive Eating Scale, IES; Tylka, 2006) when previous theories and instruments have already been developed and tested.

Assessment of Intuitive Eating

To overcome the excessive emphasis on the negative aspects of eating behavior, Tylka (2006) developed the Intuitive Eating Scale (IES), which measures the dimensions *Unconditional Permission to Eat* (9 items – 8 of them reverse scored – with statements like "I try to avoid certain foods high in fat, carbohydrates, or calories"), *Eating for Physical Rather than Emotional Reasons* (6 items – 5 of them reverse-scored – such as "I use food to help me soothe my negative emotions") and *Reliance on Internal Hunger/Satiety Cues* (6 items such as "I can tell when I'm slightly full"). The IES was developed and tested in four studies with university women from the USA (Tylka, 2006) and showed promising psychometric properties.

The next question that Tylka and Wilcox (2006) addressed was whether intuitive eating indeed implied more than the absence of eating pathology. Specifically, they tested whether the different subscales of the IES increased the percentage of variance explained of constructs such as positive affect or self-esteem over the variance explained by the 26-item version of the Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), a test for screening eating disorders. They found positive evidence for this incremental validity.

In spite of these results, this initial version of the scale showed some limitations (Tylka & Kroon Van Diest, 2013), such as the presence of a high number of reverse-scored items or a Cronbach's α for the *Reliance on Hunger and Satiety Cues* scale at the low end of the acceptable limit (i.e., .70). This led to the development of the Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013). A new dimension was added, *Body-Food Choice Congruence*, which measures the extent to which individuals match their food choices with their bodies' needs, and is assessed with just three items (e.g., "I mostly eat foods that give my body energy and stamina"). As in Tylka (2006) with the IES, the IES-2 offered a statistically significant increment over the EAT-26 in the percentage of explained variance for several variables.

Recently, the IES-2 has been adapted to French by Camilleri et al. (2015), with some problems replicating the original four-factor structure: The *Body-Food Choice Congruence* factor was removed from this version. Carbonneau et al. (2016) have adapted the IES-2 to French-Canadian. They recovered the four factors of the IES-2, but the uniquenesses of the pairs of items 13-14 and 22-23 had to be allowed to correlate. Van Dyck, Herbert, Happ, Kleveman, and Vögele (2016) have adapted the questionnaire to German. They have also found evidence favoring the four-factor solution, although some unclearly specified correlations between item uniquenesses had to be freed. They found that *Restrained Eating* as assessed with the Dutch Eating Behavior Questionnaire (DEBQ; van Strien et al., 1986) correlated –.68 with the dimension *Unconditional Permission to Eat*, whereas the DEBQ *Emotional Eating* correlated –.77 with *Eating for Physical rather than Emotional Reasons*. Ruzanska and Warschburger (2017) also adapted the IES-2 to German. They found the same pattern of results: evidence favoring the four-factor solution, although some unclearly specified correlations between item uniquenesses had to be freed. They found that *Restrained Eating*, assessed with the DEBQ, correlated –.61 with the dimension *Unconditional Permission to Eat*, whereas the DEBQ *Emotional Eating* correlated –.83 with *Eating for Physical rather than Emotional Reasons*.

The relevant correlations between *Unconditional Permission to Eat* – from the IES-2 – and *Restrained Eating* – from the DEBQ – can be explained, at least in part, by the strong overlap between both constructs, as indicated by their item wording. For instance, Item 16 of the IES-2 reads "I allow myself to eat what food I desire at the moment", while Item 11 of the DEBQ reads "Do you try to eat less at mealtimes than you would like to eat?". The same can be said about *Eating for Physical rather than Emotional Reasons* (IES-2; e.g., Item 2, "I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry") and *Emotional Eating* (DEBQ, e.g., Item 5, "Do you have a desire to eat when you are depressed or discouraged?" and Item 20, "Do you get the desire to eat when you are anxious, worried or tense?").

Purpose of the Study

One of the first steps when developing a new theoretical framework is to justify the novelty and need for it. If there are some previous theories or models that tap overlapping

constructs, the incremental validity of the new proposal must be assessed (Haynes & Lench, 2003; Hunsley & Meyer, 2003). From our point of view, that was not done in the case of intuitive eating. Showing that intuitive eating is different from disordered eating as measured with the EAT-26 (Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006) is not the same as showing that intuitive eating is a new perspective with regard to eating styles. This can only be done when intuitive eating and the three existing eating styles (restrained, emotional, and external eating) are simultaneously evaluated. That check of the novelty of intuitive eating over and above restrained, emotional, and external eating is the goal of the present study. All through the paper, we will consider intuitive eating and its commonly used measure (IES-2) as basically interchangeable. The best way to understand what a theory or a construct is, is to evaluate the way it is operationalized, especially when there appears to be a clear consensus about the method of assessment. For this purpose, the adaptation of the IES-2 to the Spanish language was a necessary first step.

Method

Participants and Procedure

The battery of questionnaires was administered through the Internet. The link was distributed through social nets (mainly Facebook and Twitter) and the e-mail distribution lists of the students from the university of the first two authors. Participants provided informed consent after reading the description of the study, where the anonymity of the responses was clearly stated. Participants had to be 18 years old or older to take the survey.

A total of 1,095 participants completed the measures, 809 women (73.9%) and 286 men (26.1%). The mean age was 24.86 years (SD = 7.30, range [18, 65]). Concerning educational level, 0.2% of the sample reported not having completed primary studies, 2.4% completed secondary studies, 67.1% were university students, and 30.3% had completed university studies. The BMI, computed with self-reported height and weight, had a mean of 22.46 (SD = 3.39, range [14.30, 41.77]).

Measures

Sociodemographics, Weight, and Height

Participants reported their sex, age, education level, and nationality. They also reported their weight (to the nearest kilogram) and height (to the nearest centimeter).

Intuitive Eating Scale-2 (Tylka & Kroon Van Diest, 2013)

As previously described, this scale comprises 23 items grouped in four different subscales: *Unconditional Permission to Eat* (6 items, three of them reverse-scored), *Eating for Physical rather than Emotional Reasons* (8 items, four reverse-scored), *Reliance on Hunger and Satiety Cues* (6 items), and *Body-Food Choice Congruence* (3 items). Responses are provided on a scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Scores for each subscale of the IES-2 are computed as the mean response of the items belonging to that dimension.

The IES-2 was translated from English to Spanish following four steps:

(1) The first and second authors of this study independently translated the IES-2;
(2) Each version was sent to the other translator and each translator independently evaluated both versions, chose between the two translations for each item and could rewrite a new version;
(3) The two translators met to discuss and agreed on a proposal; and
(4) This proposal was sent to the fourth author for new comments, which were integrated into the final version.

Test translation followed the International Test Commission Guidelines (Muñiz, Elosua, & Hambleton, 2013).

Dutch Eating Behavior Questionnaire (DEBQ; van Strien et al., 1986)

Although there are several scales available for assessing restrained, emotional, and external eating styles, the DEBQ is the only questionnaire that simultaneously covers all three eating styles and was developed in community samples. The DEBQ comprises 33 items, responded to on a Likert-type scale ranging from 1 = *seldom* to 5 = *very often*. The *Emotional Eating* scale contains 13 items (e.g., "Do you have the desire to eat when you are irritated?"), the *External Eating* scale has 10 items (e.g., "Do you eat more than usual when you see others eating?"), and the *Restraint* scale contains 10 items (e.g., "Do you deliberately eat less in order to not become heavier?"). We used the Spanish version (Cebolla, Barrada, van Strien, Oliver, & Baños, 2014).

Body Dissatisfaction Subscale of the Eating Disorder Inventory-2 (EDI-2; Garner, 1991)

This subscale has nine items, with wordings like "I feel satisfied with the shape of my body", intended to measure overall body dissatisfaction by asking respondents to rate

on a 6-point Likert scale, from 1 = *never* to 6 = *always*, their dissatisfaction with their figure or specific parts of the body. The Spanish version was presented by Garner (1998).

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988)

The PANAS has 20 items measuring both positive and negative affect, with 10 items per dimension. Participants are asked to rate on a 5-point Likert scale, from 1 = *very slightly or not at all* to 5 = *extremely*, how much they experience different feelings and emotions, such as "Enthusiastic" for positive affect or "Nervous" for negative affect. We used the Spanish version of Moral de la Rubia (2011). When incorporating the PANAS into the web-survey, we incorrectly did not include one item per dimension, so our inadvertently shortened version only had 18 items.

Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985)

The SWLS assesses satisfaction with life through 5 items, such as "I am satisfied with my life," responded to on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. We used the Spanish version of the scale of Vázquez, Duque, and Hervás (2013).

Weight Control Behavior Checklist (WCB; Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011)

We asked the participants if they had engaged in 15 different behaviors (e.g., "used laxatives" or "skipped meals") in order to reduce or control their weight during the last year. Responses were coded as *No* = 0 and *Yes* = 1. We used the Spanish version administered in the MABIC Project by Sánchez-Carracedo et al. (2013).

For all the questionnaires, higher scores are interpreted as higher levels in the construct that lends its name to the scale or subscale.

Analyses

We followed four steps to analyze the data. First, we computed descriptive statistics of the different subscales, associations between variables (Pearson correlations between numerical variables; Cohen's *d* between sex and the rest of variables), and Cronbach's alpha for all the dimensions. In this phase, we assumed that all the theoretical dimensions of the instruments would hold sound.

Second, we tested the dimensional structure of the IES-2 scores and the DEBQ scores separately. For the IES-2, we tested two different confirmatory factor analysis (CFA) models: one, without correlated uniquenesses (Tylka & Kroon Van Diest, 2013); the other, where the uniquenesses of the pairs Item 13 – Item 14 and Item 22 – Item 23 were allowed to correlate (Carbonneau et al., 2016). By testing only previously published models, we discarded problems of capitalization on chance with model respecifications. We compared the fit of the best fitting CFA model with the fit of an exploratory structural equation model (ESEM). In this way, we can evaluate the adequacy of not fixing all the secondary loadings to zero. For the DEBQ, we tested an ESEM model with the correlated uniquenesses described in Barrada, van Strien, and Cebolla (2016) and Cebolla et al. (2014). In these papers, an ESEM was the preferred method to model the inter-item correlations of the 33 items of the DEBQ.

Third, we analyzed the factor structure of both the items of the IES-2 (four theoretical factors) and the DEBQ (three theoretical factors). For this purpose, we used two approaches. In the first one, the inter-item correlations of the IES-2 items were modeled with the model that provided the best fit in the previous step and the inter-item correlations of the DEBQ were modeled with the described ESEM (Barrada et al., 2016; Cebolla et al., 2014). By doing so, no cross-loadings between the IES-2 and the DEBQ factors were allowed. We considered the assumption of no relevant cross-loading to have low probability to hold. Not incorporating relevant cross-loadings in the model can distort the inter-factor correlations (Asparouhov and Muthén, 2009). Considering this, in the second approach all the items were simultaneously submitted to an ESEM analysis, which allows for cross-loadings. If the IES-2 and the DEBQ are assessing conceptually distinguishable – albeit related – constructs, a solution with seven factors should show an adequate fit and a clear structure. If two dimensions are so related – as indicated by their correlation based on summed scores or latent factors – that they can be statistically collapsed, a lower number of dimensions would be required to explain the inter-item correlations. If the inter-item correlations of two sets of items, each set operationalizing a supposedly different construct, can be explained by a single latent dimension, it becomes difficult to argue that those two constructs are, in fact, different. For all the factor models we interpreted the standardized solution (STDYX solution in M*Plus*).

Goodness of fit of all the derived models was assessed with the common cutoff values for the fit indices (Hu & Bentler, 1999): CFI and TLI with values greater than .95 and RMSEA less than .06 are indicative of a satisfactory fit. We localized areas of ill fit through the inspection of modification indices (MI). For all the models, the weighted least squares means and variance (WLSMV) estimator was used. By using this estimator we were able to maintain the categorical nature of the responses (Finney & DiStefano, 2006). For the ESEM models, we used target rotation. As described by Asparouhov and Muthén (2009),

> "[c]onceptually, target rotation can be said to lie in between the mechanical approach of EFA [exploratory

factor analysis] rotation and the hypothesis-driven CFA model specification. In line with CFA, target loading values are typically zeros representing substantively motivated restrictions. Although the targets influence the final rotated solution, the targets are not fixed values as in CFA, but zero targets can end up large if they do not provide good fit" (p. 409).

Fourth, partial correlations were computed. We assessed the relation between positive and negative affect, body dissatisfaction, satisfaction with life, and weight control behaviors, on the one hand, with the four dimensions of the IES-2, on the other hand, while simultaneously controlling for restrained eating, emotional eating, and external eating. In this way, we could evaluate the incremental validity of the newly proposed constructs after removing the variance explained by the DEBQ.

ESEM and CFA models were estimated with M*plus* 7.4 (Muthén & Muthén, 1998–2015). The rest of the analyses were performed with *R* 3.4.1 (R Core Team, 2017). We used the packages *psych* version 1.6.12 (Revelle, 2017) and *MplusAutomation* version 0.6-4 (Hallquist & Wiley, 2016). No missing data were present in our database. Data and all syntax files needed to reproduce the analyses are available as Electronic Supplementary Materials, ESM 1–10.

Results

Reliabilities and Correlations

The Cronbach's α for the assessed dimensions, descriptive statistics, and associations for the different variables can be seen in Table 1. The reliability of the scales, as measured by Cronbach's α, were adequate for our research purposes, as they ranged from .72 (*Body-Food Choice Congruence*) to .95 (*Emotional Eating*).

We will not comment on all the associations. Age was basically unrelated with all the variables, $|r| \leq .11$, except for BMI, $r = .25$. The higher correlation for BMI was with *Body Dissatisfaction*, $r = .31$. Regarding sex, we will only indicate medium-high differences, $d \geq 0.50$. Men presented higher means in *Eating for Physical rather than Emotional Reasons*, $d = 0.59$, and higher mean BMI, $d = 0.77$; women presented a higher mean in *Body Dissatisfaction*, $d = 0.66$, and in *Emotional Eating*, $d = 0.51$.

The correlations among the different dimensions of the IES-2 subscales were small, ranging from –.18 to .29. Most importantly, the IES-2 subscales presented high correlations between two of the dimensions that we expected to be highly overlapping: *Eating for Physical rather than Emotional Reasons* with *Emotional Eating*, $r = -.82$; and *Unconditional Permission to Eat* with *Restrained Eating*, $r = -.70$. Contrary to our expectation, *Reliance on Hunger and Satiety Cues* and *External Eating* were essentially independent, $r = -.03$. The *p*-values of all the reported associations were < .001, with the exception of the last correlation, $p = .300$.

Factor Structure of the IES-2

We started by fitting a CFA model without correlated errors. The fit of this and the following models can be seen in Table 2. For this model, the fit was clearly below our proposed cut points, CFI = .938, TLI = .930, RMSEA = .089. In the next model, the uniquenesses of two pairs of items were allowed to correlate, which led to an improvement of model fit, CFI = .953, TLI = .947, RMSEA = .078, although the TLI and, mainly, RMSEA values were not in the satisfactory range. Two modification indices stood out, both indicating the adequacy of allowing a cross-loading in the *Eating for Physical rather than Emotional Reasons* factor: Item 4, MI = 176.6, and Item 7, MI = 161.1. The ESEM model, where the items loaded on all the factors, did not present a relevant improvement in model fit, especially when we examine the fit indices that consider model complexity, CFI = .962, TLI = .942, RMSEA = .081. Taking this into account, we considered that the best fitting solution for the IES-2 was the CFA model with correlated uniquenesses.

In this model, the unsigned loadings (|λ|), which can be seen in Table 3, were medium-high for all the items: for *Eating for Physical rather than Emotional Reasons*, $M_{|\lambda|} = .76$, range [.56, .87]; for *Unconditional Permission to Eat*, $M_{|\lambda|} = .68$, range [.59, .81]; for *Reliance on Hunger and Satiety Cues*, $M_{|\lambda|} = .75$, range [.60, .84]; and for *Body-Food Choice Congruence*, $M_{|\lambda|} = .75$, range [.59, .93]. The correlations between uniquenesses were high: for Item 22 – Item 23, equal to .77; for Item 13 – Item 14, equal to .42.

For the DEBQ scores, the ESEM model provided an adequate fit, although the RMSEA was slightly over the cut point, CFI = .966, TLI = .958, RMSEA = .063.

Factor Structure of the IES-2 and the DEBQ

We tested three different models. The first one had seven factors (four for the IES-2 scores and three for the DEBQ scores). The IES-2 items were modeled with a CFA and the DEBQ items with an ESEM. The second model had the same seven factors and all the items were submitted to an ESEM. In the final model, following the correlations observed between scales, we tested an ESEM with five

Table 1. Descriptive statistics, associations, partial correlations, and Cronbach's α for the assessed dimensions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Pearson correlations															
1. IES UncP															
2. IES EatP	*.13*														
3. IES RelH	*.29*	*.21*													
4. IES B-FC	*−.18*	*.26*	*.15*												
5. DEBQ Emot	*−.13*	*−.82*	*−.22*	*−.20*											
6. DEBQ Restr	*−.70*	*−.29*	*−.24*	*.06*	*.31*										
7. DEBQ Exter	*.14*	*−.45*	−.03	*−.17*	*.53*	*.08*									
8. PANAS NA	−.05	*−.31*	.00	*−.15*	*.30*	*.15*	*.21*								
9. PANAS PA	.03	*.18*	.02	*.17*	*−.16*	−.02	−.01	*−.13*							
10. SWLS	*.07*	*.19*	.02	*.15*	*−.18*	*−.10*	−.02	*−.36*	*.36*						
11. EDI BD	*−.28*	*−.46*	*−.22*	*−.22*	*.42*	*.49*	*.23*	*.26*	*−.19*	*−.27*					
12. WCB	*−.53*	*−.33*	*−.19*	.05	*.29*	*.73*	*.07*	*.16*	−.03	*−.07*	*.46*				
13. Age	*−.07*	.00	*−.06*	−.03	.02	*.08*	*−.11*	*−.08*	.05	−.01	−.03	−.01			
14. BMI	*−.12*	*−.16*	*−.16*	*−.10*	*.11*	*.18*	.00	.00	−.03	*−.09*	*.31*	*.18*	*.25*		
Cohen's *d*															
15. Sex (*men* = 1)	*0.21*	*0.59*	0.09	*0.14*	*−0.51*	*−0.42*	−0.09	−0.11	*0.21*	−0.07	*−0.66*	*−0.44*	*0.16*	*0.77*	
Partial correlations controlling for DEBQ Emot, DEBQ Restr, DEBQ Exter															
8. PANAS NA	.03	*−.11*	*.07*	*−.10*											
9. PANAS PA	.01	*.10*	−.02	*.15*											
10. SWLS	−.00	*.08*	−.03	*.13*											
11. EDI BD	.06	*−.21*	*−.08*	*−.23*											
12. WCB	−.03	*−.18*	−.01	.02											
M	3.39	3.51	3.15	3.56	28.09	26.05	31.19	16.07	22.26	22.84	28.84	5.36	24.86	22.46	0.26
SD	0.82	0.89	0.82	0.71	10.53	8.64	6.58	4.69	4.55	6.59	10.74	2.98	7.30	3.39	0.44
α	.79	.88	.86	.72	.95	.91	.85	.82	.78	.87	.90	.81			

Notes. IES = Intuitive Eating Scale-2; UncP = Unconditional Permission to Eat; EatP = Eating for Physical rather than Emotional Reasons; RelH = Reliance on Hunger and Satiety Cues; B-FC = Body-Food Choice Congruence; DEBQ = Dutch Eating Behavior Questionnaire; Emot = Emotional Eating; Restr = Restrained Eating; Exter = External Eating; PANAS = Positive and Negative Affect Schedule; NA = Negative Affect; PA = Positive Affect; SWLS = Satisfaction with Life Scale; EDI = Eating Disorder Inventory-2; BD = Body Dissatisfaction; WCB = Weight Control Behaviors; BMI = Body Mass Index. Italicized values correspond to statistically significant correlations ($p < .05$). Shaded cells correspond to the pairs of dimensions that were expected to be highly similar. Sex was coded with a dummy variable, where 0 = women and 1 = men.

Table 2. Goodness of fit indices for the different models

Models	χ^2 †	*df*	CFI	TLI	RMSEA
M1. CFA IES-2	2,153.4	224	.938	.930	.089
M2. CFA IES-2 CU	1,687.7	222	.953	.947	.078
M3. ESEM IES-2 CU	1,358.2	165	.962	.942	.081
M4. ESEM DEBQ CU	2,254.3	423	.966	.958	.063
M5. CFA IES-2 CU & ESEM DEBQ CU	6,479.0	1,392	.937	.930	.058
M6. ESEM IES-2 CU & DEBQ CU 7 FACTORS	3,827.1	1,158	.967	.956	.046
M7. ESEM IES-2 CU & DEBQ CU 5 FACTORS	6,448.3	1,259	.935	.921	.061

Notes. df = degrees of freedom; TLI = Tucker-Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; CFA = confirmatory factor analysis; ESEM = exploratory structural equation modeling; CU = correlated uniquenesses. †All *p*-values for the χ^2 test were < .001.

factors, where *Emotional Eating* was expected to collapse with *Eating for Physical rather than Emotional Reasons* (correlation between observed scores = −.82), like *Restrained Eating* with *Unconditional Permission to Eat* (correlation between observed scores = −.70). We maintained the correlated uniquenesses from previous models.

Table 3. Factor loadings and inter-factor correlations for the IES-2 scores (confirmatory factor analysis with correlated uniquenesses)

	Factor loadings (M2)			
	EatP	UncP	RelH	B-FC
I10. I use food to help me soothe my negative emotions.	**−.87**			
I02. I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry.	**−.86**			
I11. I find myself eating when I am stressed out, even when I'm not physically hungry.	**−.84**			
I05. I find myself eating when I am lonely, even when I'm not physically hungry.	**−.77**			
I15. I find other ways to cope with stress and anxiety than by eating.	**.77**			
I14. When I am lonely, I do NOT turn to food for comfort.	**.71**			
I12. I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort.	**.68**			
I13. When I am bored, I do NOT eat just for something to do.	**.56**			
I16. I allow myself to eat what food I desire at the moment.		**.81**		
I09. I have forbidden foods that I don't allow myself to eat.		**−.73**		
I17. I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat.		**.66**		
I01. I try to avoid certain foods high in fat, carbohydrates, or calories.		**−.65**		
I04. I get mad at myself for eating something unhealthy.		**−.62**		
I03. If I am craving a certain food, I allow myself to have it.		**.59**		
I21. I rely on my hunger signals to tell me when to eat.			**.84**	
I08. I trust my body to tell me how much to eat.			**.81**	
I23. I trust my body to tell me when to stop eating.			**.77**	
I06. I trust my body to tell me when to eat.			**.77**	
I22. I rely on my fullness (satiety) signals to tell me when to stop eating.			**.72**	
I07. I trust my body to tell me what to eat.			**.60**	
I19. I mostly eat foods that make my body perform efficiently (well).				**.93**
I20. I mostly eat foods that give my body energy and stamina.				**.72**
I18. Most of the time, I desire to eat nutritious foods.				**.59**
	Inter-factor correlations			
	EatP	UncP	RelH	B-FC
EatP				
UncP	.17			
RelH	.25	.36		
B-FC	.31	−.25	.19	

Notes. EatP = Eating for Physical rather than Emotional Reasons; UncP = Unconditional Permission to Eat; RelH = Reliance on Hunger and Satiety Cues; B-FC = Body-Food Choice Congruence. Shaded cells indicate the factor where the item theoretically belongs. Loadings in bold indicate unsigned loadings over |.30|. Items ordered by unsigned loading.

For the seven-factor CFA-ESEM model, the fit to the data was below the recommended thresholds, CFI = . .937, TLI = . .930, RMSEA = .058. When we inspected the modification indices, we found values as high as 408.4, indicating the convenience of allowing Item 4 of the IES-2 (*Eating for Physical rather than Emotional Reasons* dimension) to load on the *Emotional Eating* dimension of the DEBQ. In this model, *Emotional Eating* and *Eating for Physical rather than Emotional Reasons* factors correlated .90; *Restrained Eating* and *Unconditional Permission to Eat* factors correlated .82. These large correlations should be interpreted with caution given the presence of relevant specification errors.

The ESEM seven-factor solution provided an adequate fit to the data, CFI = .967, TLI = .956, RMSEA = .046. Item loadings for this and the next model can be seen in Table 4. For this model, the problem was its interpretability. Applying the threshold of $|\lambda| \geq .30$, 15 items showed relevant cross-loadings, mainly between the pairs of dimensions *Emotional Eating – Eating for Physical rather than Emotional Reasons* and *Restrained Eating – Unconditional Permission to Eat*. In the *Unconditional* factor, $M_{|\lambda|}$ was rather small, equal to .33, so we consider that the content of the items belonging to this factor were better recovered by the *Restrained Eating* factor. The *Eating for Physical rather than Emotional Reasons* consisted of the items related to eating in response to boredom (e.g., Item 13 of IES-2 – "When I am bored, I do NOT eat just for something to do" – or Item 3 of DEBQ – "Desire to eat when nothing to do…" –), although not all the items that loaded on that factor tap this content.

Table 4. Factor loadings and inter-factor correlations for the DEBQ and IES-2 scores (exploratory structural equation models with correlated uniquenesses with seven and five-factor solutions)

	Seven-Factor Solution (M6)							Five-Factor Solution (M7)				
	Factor Loadings							Factor Loadings				
	Emot	Restr	Exter	EatP	UncP	RelH	B–FC	Emot	Restr	RelH	Exter	B–FC
D01	**.68**	.05	.07	.07	.08	−.02	.05	**.75**	.02	−.01	.05	.13
D03*	.00	.00	***.41***	***.53***	−.05	−.09	.01	**.42**	.03	−.05	***.39***	−.17
D05*	**.58**	.12	.04	***.31***	.20	−.05	.08	**.86**	.05	.02	.02	−.02
D08*	**.43**	−.03	.13	***.41***	−.13	.01	−.04	**.74**	.02	.02	.08	−.08
D10	**.77**	−.06	.08	.09	−.15	.01	−.05	**.86**	−.03	−.03	.02	.14
D13	**.84**	−.05	.07	.01	−.03	−.03	.01	**.87**	−.06	−.04	.03	.19
D16	**.86**	−.02	.06	−.08	.00	−.05	−.07	**.85**	−.06	−.07	.01	.17
D20	**.63**	.08	−.01	.26	.26	−.06	.10	**.88**	.00	.02	−.03	.01
D23	**.87**	.01	−.02	.09	.04	−.03	.01	**.98**	−.03	−.03	−.06	.16
D25	**.89**	.00	.06	.02	.04	.02	.02	**.95**	−.05	.01	.02	.21
D28*	.23	−.02	.29	***.44***	−.03	−.07	.03	**.57**	.01	−.04	.26	−.10
D30	**.85**	−.12	.05	−.12	−.24	.03	−.09	**.78**	−.06	−.03	−.03	.20
D32	**.89**	−.04	.09	−.02	−.15	.02	−.03	**.90**	−.02	−.02	.02	.22
I02	.27	.24	−.01	**.56**	***.31***	−.02	.07	**.77**	.12	.10	−.02	−.20
I05	.15	.07	.13	**.64**	−.08	.05	.00	**.64**	.10	.09	.10	−.20
I10*	***.42***	.17	.00	***.44***	.13	−.07	.02	**.78**	.13	.00	−.02	−.12
I11*	***.38***	.17	−.03	***.46***	***.35***	−.04	.10	**.81**	.05	.08	−.03	−.13
I12	−.29	−.02	.15	**−.48**	.02	.02	.09	**−.67**	−.02	.00	.18	.18
I13	.14	.06	−.26	**−.67**	.18	.07	.07	**−.37**	−.01	.05	−.24	.24
I14	−.15	.10	.02	**−.66**	.24	.03	.13	**−.65**	.01	.02	.07	.23
I15	−.21	.02	.14	**−.62**	.10	.07	.18	**−.70**	.00	.05	.18	.29
D04	−.09	**.86**	.04	.02	.02	.04	−.07	−.09	**.84**	.08	.10	−.13
D07	−.02	**.75**	−.03	.09	−.20	−.05	.03	.02	**.86**	−.01	−.02	−.03
D11	−.01	**.73**	.09	.07	−.09	−.09	−.02	.02	**.77**	−.05	.12	−.07
D14*	−.05	**.43**	.01	−.08	−.29	−.08	**.36**	−.16	**.66**	−.05	.01	***.32***
D17	.12	**.58**	.04	.05	−.20	.01	−.03	.14	**.66**	.02	.03	−.01
D19	.03	**.75**	.06	−.09	.01	.06	−.01	−.06	**.74**	.10	.10	−.03
D22	−.03	**.90**	.05	.04	−.01	−.04	−.03	−.02	**.91**	.02	.11	−.11
D26	−.04	**.78**	.07	.03	−.07	−.07	−.06	−.03	**.81**	−.03	.11	−.11
D29	.03	**.61**	−.05	.17	−.11	.18	−.26	.16	**.58**	.18	−.05	−.24
D31	.08	**.72**	.06	−.04	−.17	−.01	.00	.02	**.81**	.01	.07	.00
I01*	−.05	***.42***	−.11	−.02	−.21	−.13	.30	−.11	**.62**	−.09	−.10	.24
I03	−.07	−.21	**.33**	.01	**.40**	.13	.02	−.02	**−.42**	.13	***.38***	−.04
I04*	.02	***.44***	−.01	.17	−.28	.04	.15	.13	**.60**	.07	−.03	.09
I09*	.07	***.34***	−.12	.04	**−.45**	−.03	.19	.06	**.61**	−.02	−.17	.20
I16*	−.14	***−.39***	.16	.09	**.33**	.24	−.07	−.04	**−.60**	.22	.19	−.11
I17	−.14	−.28	.07	.06	**.30**	.20	−.13	−.06	**−.48**	.19	.09	−.16
D02	−.10	.04	**.61**	.16	.21	−.09	.03	.06	−.07	−.06	**.63**	−.07
D06	.04	.00	**.58**	.08	.14	−.05	.02	.13	−.08	−.04	**.58**	−.02
D09	.01	.05	**.79**	−.13	.05	−.02	.01	−.07	.00	−.03	**.79**	.05
D12	−.03	.03	**.54**	.04	.14	−.02	−.05	.03	−.08	−.02	**.55**	−.07
D15	.14	.14	**.61**	−.27	.04	−.02	−.06	−.06	.08	−.04	**.62**	.04
D18	.08	−.09	**.64**	.03	−.17	.06	.03	.11	−.04	.03	**.60**	.07
D21	.05	.13	**.70**	.06	.11	.01	−.03	.12	.03	.01	**.71**	−.05
D24	.27	.10	**.64**	−.23	−.07	.03	−.08	.10	.07	.00	**.61**	.07
D27	.21	.01	**.50**	.05	−.18	.08	−.02	.25	.06	.05	**.46**	.05
D33	.03	−.02	**.49**	−.01	.09	−.03	.09	.04	−.05	−.02	**.49**	.07

(Continued on next page)

Table 4. (Continued)

	Seven-Factor Solution (M6)							Five-Factor Solution (M7)				
	Factor Loadings							Factor Loadings				
	Emot	Restr	Exter	EatP	UncP	RelH	B–FC	Emot	Restr	RelH	Exter	B–FC
I06	.05	.09	–.04	–.04	–.04	**.82**	–.01	.00	.04	**.79**	–.07	.04
I07	.03	.01	.01	.16	–.05	**.69**	–.04	.15	–.04	**.66**	–.02	–.04
I08	–.03	.06	–.01	.08	.04	**.84**	.01	.01	–.03	**.82**	–.03	.00
I21	.02	.07	.07	–.09	.06	**.83**	.11	–.07	–.01	**.81**	.06	.13
I22	–.04	–.01	–.07	–.05	.10	**.64**	.09	–.09	–.10	**.62**	–.06	.08
I23	–.03	.03	–.01	–.04	.07	**.73**	.04	–.08	–.06	**.71**	–.02	.05
I18	.01	–.05	.03	–.08	–.05	.11	**.54**	–.08	.10	.13	.05	**.50**
I19	–.02	–.09	–.03	–.06	–.11	.00	**.92**	–.12	.20	.06	.00	**.78**
I20	.01	–.23	–.03	.00	–.11	.14	**.71**	–.02	–.01	.17	–.01	**.66**
	Inter-Factor Correlations							Inter-Factor Correlations				
	Emot	Restr	Exter	EatP	UncP	RelH	B–FC	Emot	Restr	RelH	Exter	B–FC
Emot												
Restr	.32							.30				
Exter	.41	–.01						–.18	–.25			
EatP	.65	.21	.41					.48	–.01	.04		
UncP	–.02	–.29	.14	.07				–.21	.07	.03	–.17	
RelH	–.23	–.30	.01	–.17	.12							
B–FC	–.09	.23	–.14	–.15	–.09	.01						

Notes. Emot = Emotional Eating; Restr = Restrained Eating; Exter = External Eating; EatP = Eating for Physical rather than Emotional Reasons; UncP = Unconditional Permission to Eat; RelH = Reliance on Hunger and Satiety Cues; B-FC = Body-Food Choice Congruence. Factor labels correspond to the expected content, not to the found content. Item numbering starting with I corresponds to the IES-2, starting with D to the DEBQ. Shaded cells indicate the factor where the item theoretically belongs. Loadings in bold indicate unsigned loadings over |.30|. Italicized values indicate cross-loadings over |.30|. Items with an asterisk indicate problematic items due to two loadings over |.30| in the seven-factor solution.

The other three factors were more clearly recovered. In this solution, the largest modification index corresponded to the correlation between the uniquenesses of the DEBQ Items 18 and 27 – both measuring *External Eating* – MI = 173.1.

Importantly, in the ESEM seven-factor solution factor labels correspond to the expected content, not to the found content. It is doubtful that the content of all the recovered factors corresponds to the theoretically expected content. In line with this, the factors labeled *Restrained Eating* and *Unconditional Permission to Eat* correlated –.29, while the correlation based on summed scores was –.70.

In the ESEM five-factor solution, all five factors could be clearly theoretically interpreted, with a low presence of relevant cross-loadings – only three secondary loadings were $\geq$ .30 – but the model fit was worsened, CFI = .935, TLI = .921, RMSEA = .061. In this model, the higher modification index corresponded to the correlation between the uniquenesses of the IES-2 Items 19 and 20 – both measuring *Body-Food Choice Congruence* – MI = 422.3.

Partial Correlations

We computed partial correlations between five dependent variables and IES-2 scores while controlling for the three eating styles assessed by the DEBQ. As can be seen in Table 1, for three IES-2 dimensions, the sizes of the partial correlations were greatly reduced in comparison with the zero-order correlations. The maximum zero-order correlation was .53; for partial correlations, the maximum was .23. In the case of *Unconditional Permission to Eat*, the mean (unsigned) correlation dropped from .19 to .03 (maximum partial correlation = .06); for *Eating for Physical rather than Emotional Reasons*, from .29 to .14 (maximum = .21); for *Reliance on Hunger and Satiety Cues*, from .09 to .04 (maximum = .08). The exception was *Body-Food Choice Congruence*, where the mean of zero-order correlations was .15 and the mean for the partial correlations was .13 (maximum = .23). In spite of these reductions, several of the partial correlations remained statistically significant.

Discussion and Conclusions

Is the concept of intuitive eating really novel? Some of the proposed dimensions of intuitive eating seem to closely resemble the eating styles with a long scientific tradition, namely, emotional, external, and restrained eating. Our goal was to evaluate the incremental validity of intuitive eating over and above these already existing eating styles.

Similar to Tylka and Kroon Van Diest (2013), we found that the Spanish translation of the IES-2 had a satisfactory dimensional validity and adequate internal consistency. The inclusion of two correlated uniquenesses, as in Carbonneau et al. (2016), markedly improved the model fit. In spite of this general trend, the RMSEA of the final model was slightly over the proposed threshold. It is not uncommon for the interpretation of different fit indices like RMSEA and CFI to disagree (Lai & Green, 2016).

Following our expectations and considering summed scores, *Emotional Eating* from the DEBQ and *Eating for Physical rather than Emotional Reasons* from the IES-2 presented a high correlation; the same can be said about *Restrained Eating* from the DEBQ and *Unconditional Permission to Eat* from the IES-2. Contrary to our hypothesis, *External Eating* from the DEBQ and *Reliance on Hunger and Satiety Cues* from the IES-2 were essentially independent.

A simultaneous factor analysis of the DEBQ and IES-2 showed some interesting findings. The CFA-ESEM seven-factor solution provided a fit below the recommended thresholds. Although the correlations *Emotional Eating – Eating for Physical rather than Emotional Reasons* and *Restrained Eating – Unconditional Permission to Eat* factors were in line with our expectations (*r*s > .80), we consider that these results should not be considered. The modification indices pointed to the convenience of allowing cross-loadings between the IES-2 and the DEBQ factors. Not including in a model, relevant cross-loadings can distort to a large degree the estimation of inter-factors correlations (Asparouhov & Muthén, 2009). The ESEM seven-factor solution showed satisfactory model fit. As Morin, Marsh, and Nagengast (2013) noted: "ESEM should generally be preferred to ICM-CFA when the factors are appropriately identified by ESEM, the goodness of fit is meaningfully better than for ICM-CFA, and factor correlations are meaningfully smaller than for ICM-CFA" (p. 430; where ICM-CFA refers to the independent cluster model CFA, CFAs where items are allowed to correlate in a single factor, the common practice). Both conditions are met in our results. Considering this, our ESEM seven-factor solution should be preferred over the CFA-ESEM solution. However, the ESEM seven-factor solution showed a large number of relevant cross-loadings that hampered the interpretation of the obtained results. The loadings for the *Unconditional Permission to Eat* factor were low in general and the loadings for the *Eating for Physical rather than Emotional Reasons* were reduced in comparison with a model with only the IES-2 items. It is not clear if this latent factor should be interpreted as *Eating for Physical rather than Emotional Reasons.* As found in Cebolla et al. (2014) with the DEBQ, the items related to boredom seem to be conceptually distinguishable with respect to other items tapping emotional eating. In the solution with five factors, the model fit, although a little worse than that of the seven-factor solution and below the recommended thresholds, was still in line with mean fit of published models (Jackson, Gillaspy, & Purc-Stephenson, 2009) but this time the solution could be clearly interpreted because two highly related pairs of subscales were found to collapse into just two factors. After inspecting the modification indices for this model, we consider that there were no substantial specification problems, as the main areas of strain were correlated uniquenesses not freed.

With the results of a better fitting ESEM model being more difficult to interpret than those of the worse-fitting ESEM model, neither the results of the seven-factor solution nor those of the five-factor solution is ideal. Nevertheless, these results, based on latent modeling, point to problems in interpreting two out of the four dimensions of the IES-2 as clearly distinguishable from the earlier eating styles. There are two options: if the seven-factor model should be preferred, two of the dimensions of intuitive eating no longer represent what they were supposed to represent; if the five-factor model should be preferred, two of the dimensions of intuitive eating can be collapsed with two dimensions of previously considered eating styles.

We also tested the novelty or utility of the intuitive eating dimensions with partial correlations computed with summed scores. This allowed us to complement the analysis of latent variables with observed scores. It could be possible that two sets of items tap the same dimension, although were better suited for measuring different extremes of the continuum. In this case, a single factor would emerge in a factor analysis, but the improvement in reliability due to conditional reliability could lead to incremental validity. Apparently, this is not the case here. For the five included criterion variables – constructs that have been previously used in research about intuitive eating (Bruce & Ricciardelli, 2016) – their associations with three out of four IES-2 scales were greatly reduced after controlling for the three DEBQ eating styles. The associations of *Reliance on Hunger and Satiety Cues* with body dissatisfaction and weight control behavior, for example, dropped from –.22 and –.19 to –.08 and –.01, respectively. An exception was *Body-Food Choice Congruence*, which was almost unaffected by the control variables.

Taken altogether, the findings suggest that two factors from the IES-2, namely, *Eating for Physical rather than Emotional Reasons* and, more clearly, *Unconditional Permission to Eat,* offer little incremental validity over and above the already existing, earlier eating styles. The *Eating for Physical rather than Emotional Reasons* factor apparently covers some aspects of emotional eating that are not fully captured by the *Emotional Eating* DEBQ factor, with elements such as eating when bored deserving further research. The comparison of the DEBQ, the IES-2, and measures that assess

eating when bored (Koball, Meers, Storfer-Isser, Domoff, & Musher-Eizenman, 2012) could shed further light on this matter. The dimension *Reliance on Hunger and Satiety Cues*, although not showing any overlap with DEBQ external eating, had only small partial correlations with our five criterion variables. The most promising scale of the IES-2 is the three-item *Body-Food Choice Congruence* scale.

Some limitations of our study should be noted. First, we used a convenience sample of mainly Spanish young adults, where women with higher education were overrepresented. Further research is needed with more representative samples. Second, we have assumed that the IES-2 validly measures the intuitive eating construct. In case of problems with the content validity of the IES-2, we could be missing some relevant aspects of intuitive eating, although, to our knowledge, the IES-2 is the most commonly used measure for assessing intuitive eating. Third, we inadvertently shortened the PANAS questionnaire, as we omitted one item per subscale. Fourth, we did not use the last version of the *Eating Disorders Inventory*, the EDI-3 (Garner, 2004), but the EDI-2. In the EDI-3, a new item is assigned to the *Body Dissatisfaction* subscale. In both cases, considering the high Cronbach's alpha for the questionnaires used and that ever shorter versions of the PANAS have been proposed (Mackinnon et al., 1999; Thompson, 2007), we consider this as a minor problem. Fifth, there is current debate about the validity of assessing eating styles by means of questionnaires (e.g., Jansen et al., 2011; van Strien, Herman, & Anschutz, 2012; van Strien, Herman, Anschutz, Engels, & de Weerth, 2012). The critical evaluation of the evidence and arguments of the different positions is clearly beyond the scope of the present paper. Sixth, data to obtain BMI were based on self-reported measures, although studies have found a high correlation between self-reported body measures and real measures (e.g., McAdams, Van Dam, & Hu, 2007). Seventh, we have not computed conditional reliabilities. It could be possible that the DEBQ and the IES-2 could be better suited to different ranges of the trait levels.

In spite of this, some relevant, albeit tentative, conclusions can be drawn. The novelty of the two of the dimensions of the intuitive eating construct as operationalized with the IES-2 (*Eating for Physical rather than Emotional Reasons* and *Unconditional Permission to Eat*) seems not as high as claimed. The other two dimensions of the IES-2 (*Reliance on Hunger and Satiety Cues* and *Body-Food Choice Congruence*) can be considered as new eating styles, mainly the second one. We have provided evidence about this, both with latent and observed variables. We are not suggesting here that intuitive eating is conceptually empty or irrelevant. We share the idea that a new glance is needed in the area of eating behavior and the relation between health and weight (Bacon & Aphramor, 2011; Mann et al., 2007). But the efforts in this line would clearly benefit from incorporating what is already known in the area of eating styles, specifically emotional and restrained eating.

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Electronic Supplementary Materials

The electronic supplementary material is available with the online version of the article at https://doi.org/10.1027/1015-5759/a000482

ESM 1. Text (.txt)
Readme.
ESM 2. Data (.dat)
Data file (variables included in ESM3).
ESM 3. Data (.Rmd)
R Mark Down file.
ESM 4. Data (.inp)
Mplus syntax for model 1.
ESM 5. Data (.inp)
Mplus syntax for model 2.
ESM 6. Data (.inp)
Mplus syntax for model 3.
ESM 7. Data (.inp)
Mplus syntax for model 4.
ESM 8. Data (.inp)
Mplus syntax for model 5.
ESM 9. Data (.inp)
Mplus syntax for model 6.
ESM 10. Data (.inp)
Mplus syntax for model 7.

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