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Christoph M, Järvelä-Reijonen E, Hooper L, Larson N, Mason SM, Neumark-Sztainer D. Longitudinal associations between intuitive eating and weight-related behaviors in a population-based sample of young adults. *Appetite*. 2021 May 1;160:105093.

What We Know, Think We Know, or Are Starting to Know

The importance of behaviours in relation to nutrition, diet, and health, has been known for some time ⁽¹⁻³⁾. However, “behaviour” as it relates to eating is a broad, opaque term that lacks specificity, and there are a number of different constructs through which eating behaviour may be considered.

Research in the 1990’s by Westenhoefer and colleagues highlighted a distinction between “flexible dietary restraint” and “rigid dietary restraint” ⁽⁴⁾. These were considered to be distinct constructs, and in the Lean Habits Study participants who made between 5 to 8 behavioural improvements had the highest percentage of successful weight loss maintenance [the 8 behaviours being flexible vs. rigid dietary control, meal regularity, eating situations [i.e., sitting down, undistracted, taking time], food choice, restriction of food quantity, physical activity, and stress coping] ⁽³⁾.

However, while Westenhoefer et al. argued that flexible and rigid restraint were distinct constructs, Tracy Tylka’s research group at The Ohio State University showed that flexible and rigid control of diet were not distinct constructs, but opposite ends of a spectrum of the same construct ⁽⁵⁾. Conversely, intuitive eating has been shown to be a distinct construct from both flexible and rigid dietary restraint ⁽⁵⁾.

The term ‘intuitive eating’ was coined by research dietitians Evelyn Tribole and Elyse Resch in 1995, and is characterised by eating according to internal hunger and satiety cues, rather than external stimuli or situational and emotional cues ⁽⁶⁾. Evidence to date indicates that people who score highly* for intuitive eating have less dichotomised thinking [“good” vs. “bad” food], less food preoccupation, and greater psychological well-being ⁽⁷⁾. The present study investigated the associations between intuitive eating and weight-related behaviours over 5yrs.

*Geek Box: Measuring Intuitive Eating

It is important to note that intuitive eating [lowercase] may refer to a measure of psychometric evaluation, and also may refer to a specific intervention itself guided by the principles of Intuitive Eating [uppercase IE], as set out by Tribole and Resch. The ten principles of IE include: i) reject the diet mentality; ii) honour your hunger; iii) make peace with food; iv) challenge the food police; v) respect your fullness; vi) discover the satisfaction factor; vii) honour your feelings without food; viii) respect your body; ix) exercise - feel the difference; x) honour your health. These 10 principles were initially clustered into three domains by Tylka, including: 1) unconditional permission to eat; 2) eating for physical rather than emotional cues; 3) reliance on hunger and satiety cues. These domains, and the principles contained therein, formed the basis of the first validated instrument to measure intuitive eating, the Intuitive Eating Scale [IES]⁽⁶⁾. Tylka et al. updated the domains of IE to include a 4th domain, that of body-food choice congruence. However, the original IES was validated in women only. Thus, in 2013 Tylka & Kroon Van Diest validated an updated version, the IES-2, which contains 23 items and included the body-food choice congruence domain, and was validated in both sexes⁽⁸⁾. Factor analysis, which identifies factors that correlate within the same person, confirmed the 4-domain construct of the IES-2. Cronbach's alpha, which is a measure of internal consistency for scale or test [over 0.70 is considered good consistency, >0.80 is stronger] for the IES-2 during validation was 0.89 and 0.87 for men and women, respectively. The IES-2 has also shown to be reproducible over time, albeit over a period of weeks [something to consider for prospective studies]. Thus, as an instrument used to assess intuitive eating in individuals, the IES-2 is a well-validated scale.

Table 1. Intuitive Eating Principles and Interoceptive Awareness

Improves Interoceptive Awareness

- *Honor your hunger.* Eat when you are biologically hungry.
- *Respect your fullness.* Stop eating when comfortably full—not too little and not too much.
- *Discover the satisfaction factor.* Aim for satisfaction when eating meals and snacks.
- *Exercise—feel the difference.* Discover enjoyable ways to move the body.

Removes Obstacles to Interoceptive Awareness

- *Reject the diet mentality.* Stop all forms of dieting, behaviorally and mentally.
- *Make peace with food.* No food is forbidden. Eat the foods you desire, based on attunement to hunger and fullness cues.
- *Challenge the food police.* Challenge the food rules, the root of which may originate from personal, family, and cultural mores and beliefs.
- *Honor your feelings without using food.* Cope with your emotions without using food.
- *Respect your body.* Your body deserves to be treated with dignity and respect, regardless of shape or size.
- *Honor your health with gentle nutrition.* Select foods that taste good, while making you feel well.

Table from Tribole (Academy of Nutrition and Dietetics. 2017;36:3:1-5) illustrating the Intuitive Eating principles and related awarenesses.

The Study

The Project Eating and Activity in Teens and Young Adults [Project EAT] is a longitudinal study of factors associated with dietary intake, physical activity, weight control behaviours, and weight status, in young people. The study encompasses the initial EAT-I in 1998-99, and three follow-up periods at 5yr intervals: EAT-II in 2003-04, EAT-III in 2008-09, and EAT-IV in 2015-16. At baseline in EAT-I, participants completed surveys on diet, physical activity, and weight control behaviours, in addition to anthropometric measures.

Participants received mailed/online assessments at each follow-up period. Only participants who had completed EAT-II and/or EAT-III follow-up assessments were invited to participate in the EAT-IV follow-up. The present study included participants who had completed the intuitive eating parts of the survey for both EAT-III and EAT-IV. Intuitive eating was assessed using a two items derived from the original version of the IES:

- *I stop eating when I feel full*
- *I trust my body to tell me how much to eat*

Four responses from *strongly disagree* to *strongly agree* were listed, and participants answering both items with either agreement option were classified as intuitive eaters.

Weight and height were self-reported, and dieting and weight control behaviours were assessed by survey questionnaires. E.g., for diet: “How often have you gone on a diet during the last year?” Weight control behaviours were classified as healthy [*exercise, ate more fruits and vegetables, ate less high-fat foods, ate less sweets, drank less sugar-sweetened beverages*] or unhealthy [*fasted, ate very little food, skipped meals, and smoked more cigarettes, took diet pills*]. Binge eating with loss of control was also assessed by validated questionnaire.

The primary analysis investigated the association between intuitive eating at EAT-III and outcomes for weight, dieting, healthy vs. unhealthy weight control behaviours, and binge eating, at EAT-IV.

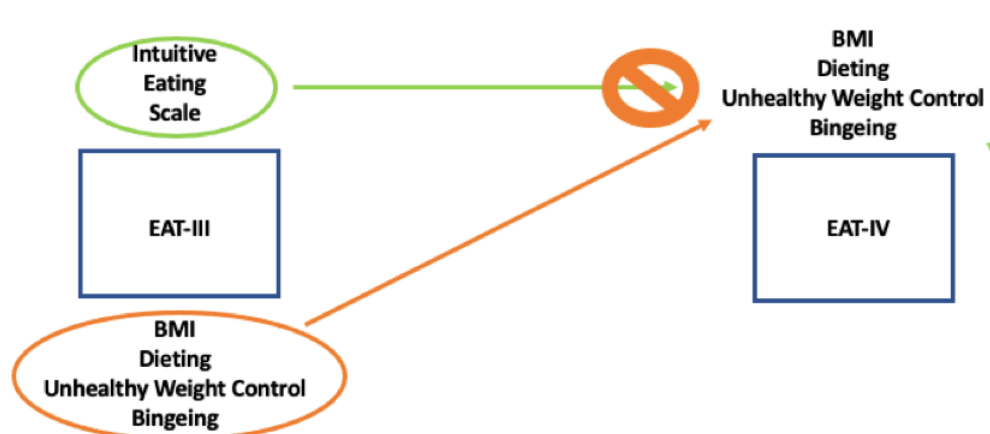


Figure Illustration of the relationship between the modified Intuitive Eating Scale and outcomes measures at EAT-III and the main outcomes at EAT-IV. The green line indicates that, in the initial analysis adjusted for demographics, IES was associated with lower levels of the respective outcomes at EAT-IV. However, the orange line and ‘stop sign’ depict the additional analysis which adjusted for the status of BMI, dieting, unhealthy weight control, and bingeing, at EAT-III, indicating that there was no longer an association for IES at EAT-III that was independent of these factors at that time.

Results: The final sample included a total of $n = 1660$ [48.1% female], the ethnic background of which was 47.8% white, 18.6% African American, 19.7% Asian, 5.7% Hispanic, 3.4% Native American, and 4.8% mixed or other ethnicity/race. 58.1% of females and 62.6% of males were classified as intuitive eaters. The mean age at EAT-III was 25yrs, and 31yrs of age at EAT-IV.

The following results were from the analysis adjusted for age, ethnicity, education, and income, and comparing IE classification at EAT-III to the EAT-IV outcomes 5yrs later:

Associations for IE & Outcomes:

• **Women:**

- **BMI>30:** 22.9% of intuitive eaters compared to 36.7% of non-intuitive eaters had BMI of >30kg/m².
- **Dieting:** 63.2% of intuitive eaters were currently dieting compared to 72.4% of non-intuitive eaters.
- **Unhealthy weight control:** 49.5% of intuitive eaters engaged in unhealthy weight control behaviours compared to 61.7% of non-intuitive eaters.
- **Binge eating:** 11.4% of intuitive eaters reported binge eating with loss of control compared to 21.1% of non-intuitive eaters.

• **Men:**

- **BMI>30:** 22.6% of intuitive eaters compared to 31.1% of non-intuitive eaters had BMI of >30kg/m².
- **Dieting:** 41.1% of intuitive eaters were currently dieting compared to 51.1% of non-intuitive eaters.
- **Unhealthy weight control:** 31.6% of intuitive eaters engaged in unhealthy weight control behaviours compared to 45.6% of non-intuitive eaters.
- **Binge eating:** 0.9% of intuitive eaters reported binge eating with loss of control compared to 1.9% of non-intuitive eaters.

The analysis also then adjusted for BMI, dieting, weight control behaviours, and binge eating with loss of control outcomes at EAT-III. In women, there were no significant associations between intuitive and non-intuitive eaters and outcomes at EAT-IV, after adjusting for the outcomes at EAT-III [more on this under **Interesting Finding**, below].

However, in men those who were classified as intuitive eaters at EAT-III were less likely to engage in unhealthy weight control behaviours and to report binge eating with loss of control at EAT-IV, even after adjusting for these outcomes at EAT-III [more on this under **Interesting Finding**, below]. The other outcomes were not related to intuitive eating, independent of their status at EAT-III.

The Critical Breakdown

Pros: The study is among the first prospective studies on this subject. The repeated measures over time is a real strength of the study. There was diverse ethnic backgrounds amongst participants, and there was a broad distribution of educational attainment levels from high school to college degree, and of income level. Thus, the overall cohort was more representative compared to many US prospective studies. The adjustment model included not only demographic covariates, but also adjusted for the score of the outcome [i.e., binge eating or dieting, etc] at the previous follow-up period. Therefore, the findings at EAT-IV in this paper were independent of that behaviour at EAT-III.

Cons: The sample included both males and females, but the items used to assess intuitive eating were derived from the initial IES, which was validated in women only. This may reflect the fact that the EAT-III follow-up period came before the validation of the IES-2 in 2013, but instrument validity is important and so this is not a minor limitation. The use of a modified version of the original IES may not have accurately characterised intuitive eating. Self-reported measures of weight height are acknowledged limitations. Studies in other countries have validated the IES/IES-2 in the local population, i.e., caution is required in extrapolating these results beyond the US context in which it was conducted.

Key Characteristic

Much of the literature investigating intuitive eating to date has been cross-sectional ^(9,10), and little is known about the relationship between intuitive eating and health related behaviours and outcomes prospectively, i.e., over time. In a cross-sectional study, data is analysed from a sample population at a specific moment in time, i.e., take Group A and Group B and investigate the association between a particular exposure and outcome in two comparative groups based on the data at that specific time period. While useful to look at specific characteristics of a population with a particular exposure, they do not tell us of the relationship between an exposure and an outcome over time.

The EAT Project is one of the first cohorts to investigate the association between intuitive eating and weight and dietary behaviours prospectively, and in a population that were teens at baseline, and between 25-30yrs of age in the present study follow-up periods. The first prospective publication was published in 2018, based on 8yrs of follow-up from teens to early adolescence ⁽¹¹⁾. The present study extended that analysis to the ages between 25-30yrs of age in the follow-up periods covered by the present study. The prospective design provided important insight into the time-course relationship between eating behaviours in a life-stage known to be associated with the development of disordered eating and body image ⁽¹²⁾.

Interesting Finding

In the first analysis, which adjusted for socio-demographic factors, there were significant differences in the prevalence of each outcome according to intuitive eating vs. non-intuitive eating classification measured at EAT-III. However, in the further analysis which adjusted for the scores/measures for those outcomes as they were at EAT-III, there were no longer significant differences for all outcomes at the EAT-IV follow-up in women, and all but two outcomes were not different in men.

So what is this telling us? It means that being classified as an intuitive eater at EAT-III was not associated with better weight, dieting, and eating behaviour outcomes at EAT-IV, independent of those outcomes already being present at EAT-III follow-up period. In other words, when assessed at EAT-III already having lower BMI, more healthy weight control behaviours, not currently dieting, and less binge eating, were behaviours that were already established at that point. Being classified as an intuitive eater at that point did not result in those behaviours changing or improving over the following 5yrs, once those behaviours were accounted for.

This could mean that the relationship between intuitive eating and more healthy weight-related behaviours is established earlier in life, at least in females. The findings suggest that in men, intuitive eating may result in less unhealthy weight control behaviours later in life, independent of such behaviours earlier in life. This may reflect the fact that in EAT, prevalence of unhealthy weight control behaviours was shown to increase into adulthood in men, but not women ⁽¹³⁾.

Relevance

This primary strength of the present study is the prospective design and investigation of outcomes at two distinct time points over a 5yr follow-up period. The analysis provided interesting insight into the temporal relationship between intuitive eating and eating behaviours, in particular suggesting that in women, the associations with healthy eating behaviours may be established earlier in adolescence or early adulthood. This finding illustrates the need for more prospective studies, to examine these associations over time.

Eating intuitively has been characterised as both a flexible and adaptive eating behaviour, with energy intake guided from physiological cues on a meal-to-meal basis ⁽⁵⁾. In contrast, for example, flexible dietary restraint is not guided on a meal-to-meal basis, rather those who eat with flexible restraint may deliberately reduce energy intake with a view to controlling weight ⁽³⁾. People who eat intuitively, on the other hand, may eat less or more at a given meal because they are more or less hungry, which may be influenced by the preceding meal ⁽⁵⁾.

Much has been made in recent years, particularly in the fitness industry, of “flexible dieting” as an approach that is framed as an example of a healthy weight control behaviour. However, it should be noted that the benefits of flexible dietary restraint are only evident when contrasted with rigid dietary restraint, not as a distinct construct ^(5,14). Thus, higher levels of flexible restraint remain associated with body preoccupation and exercising for the deliberate purpose of weight control ⁽¹⁴⁾. It would be interesting to see a prospective comparison of these constructs over time.

The substantial difference in the prevalence of binge eating with loss of control between females and males in the study is consistent with the wider literature that suggests that while men may report overeating, women are more likely to report loss of control over an eating episode ⁽¹⁵⁾. Nonetheless, the data in the present study does still demonstrate a significant difference in binge eating with loss of control in women, between intuitive eaters vs. non-intuitive eaters.

There remain, however, important limitations to be addressed in future research. The first is that overall, more prospective data is needed, and in different populations. The second is that there are also some operational definitions that need to be ironed out. For example, one of the healthy weight control behaviours was “*watched my portion sizes*”, but this would fall more under the construct of flexible dietary restraint than intuitive eating ^(3,5). The final point is that the relatively crude classification of intuitive vs. non-intuitive eaters may have influenced the results, and future prospective research should classify intuitive eaters according to the full IES-2 assessment.

Application to Practice

Eating in accordance with internal, physiological hunger and satiety cues, correlates with psychological wellbeing and positive attitudes towards food, the body, and exercise. The data emerging from the EAT studies indicate that the cultivation of this construct earlier in life may be associated with better outcomes in adulthood. However, more longitudinal data will be required to provide a more robust evidence-base of the associations over time. Bear in mind that results of the present study relate to a truncated version of the Intuitive Eating Scale, and do not reflect the implementation of an Intuitive Eating intervention, which requires practitioner training to deliver effectively.

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