

# Chapter 6

## Assessment of Intuitive Eating and Mindful Eating

Melanie J. Zimmer-Gembeck,<sup>1,2</sup> Harley J. Stansfield,<sup>1</sup>  
Jessica Kerin,<sup>1,2</sup> and Caroline Donovan<sup>1</sup>

<sup>1</sup>Griffith University, School of Applied Psychology, Australia

<sup>2</sup>Griffith University, Menzies Health Institute of Queensland, Australia

### Introduction

Dieting has been under intense scrutiny in terms of both its safety and efficacy as a weight loss strategy, with research revealing that dieting can have adverse physical consequences (Dulloo et al., 2015; Herman et al., 2008; Logel et al., 2015; Montani et al., 2015; Neumark-Sztainer et al., 2012; Stroebe et al., 2017; Tomiyama et al., 2013; Vink et al., 2016). Partly as an outgrowth of this research, attention has shifted to understanding adaptive self-regulation of eating, which is based on concepts introduced decades ago as part of the anti-dieting movement (e.g., Orbach, 1978; Roth, 1993). Proponents of adaptive eating focus on health and well-being rather than body weight and shape. They promote the respect of satiety cues and eating only when hungry, the intuitive craving and selection of more nutritious foods, and the enhancement of body awareness and appreciation (Herman et al., 2008; Mathieu, 2009; Tylka, 2006; Van Dyke & Drinkwater, 2014). These tendencies are encapsulated within various views of adaptive eating, with theories and research on intuitive and mindful eating two of the most prominent (Herman et al., 2008; Van Dyke & Drinkwater, 2014).

Intuitive eating is defined as eating according to internal physiological cues of hunger and satiety (Tribole & Resch, 1995). It is founded on a philosophy that encourages a positive relationship with food, mind, and the body, rather than attempting to cognitively restrict, control, manage, or limit food and eating choices. Shifting the focus to intuitive eating is also an attempt to de-emphasize body weight when developing new eating habits. In fact, monitoring weight or attempting to lose weight while improving intuitive eating are contraindicated because intuitive eating is considered an internal interoceptive process to monitor health and well-being, while weight-control and even weight monitoring are viewed as external processes that undermine one's ability to engage in internal bodily awareness.

Mindful eating is defined as “being aware in the present moment while eating; intentionally paying attention, nonjudgmentally, to the senses, including physical and emotional

sensations” (Peitz et al., 2021, p. 3). It has been described as incorporating a range of beliefs, skills, and behaviors: eating slowly without distraction; listening to physical cues of hunger and fullness and only eating until satiated; distinguishing between physical sensations of hunger and non-hunger triggers for eating such as uncomfortable emotions or external stimuli; engaging the senses by noticing colors, smells, sounds, textures, flavors; learning to alternatively cope with uncomfortable emotions; noticing the effects food has on the body and feelings; and appreciating food. Mindful eating has been treated as a skill set that an individual can learn through dedicated mindful practice. Generic mindfulness practice has received considerable research interest and has been applied as a treatment in many clinical contexts (e.g., see Goldberg et al., 2019; Parsons et al., 2017, for reviews) including to reduce disordered eating. A systematic review of the literature (Warren et al., 2017) reported that mindful eating is significantly related to fewer binge eating symptoms, emotional eating symptoms, and food cravings, but also highlighted the need for more evidence supporting mindful eating programs for weight loss.

Given the similarities between intuitive and mindful eating, there has been discussion about whether one may be the superordinate construct of the other (Van Dyke & Drinkwater, 2014). For example, some researchers propose that intuitive eating is a broader philosophy that incorporates mindful eating plus changing cognitive distortions around body image and eating, reducing emotional eating, and encouraging body respect and physical activity (Peitz et al., 2021; Tribole, 2010). Conversely, others have described mindful eating as including most, if not all, components of intuitive eating, in addition to broader aspects related to food and nutrition (e.g., food quality and quantity, and consumption speed), and a general non-judgmental awareness of one’s physical and emotional signals when food is present (Framson et al., 2009; Fung et al., 2016; Schaefer & Magnuson, 2014). The parallels between intuitive and mindful eating are further reflected in researchers’ use of these terms somewhat interchangeably or in concert with each other (Tribole, 2010). Moreover, studies have found that self-reported intuitive eating moderately to strongly correlates with self-reported mindful eating, with correlations as high as  $r = .70$  (e.g., Kerin et al., 2019; Van Dyke & Drinkwater, 2014). However, in a study that sought to identify the components that explained covariation between three subscales from a measure of intuitive eating (Tylka, 2006), six subscales from a measure of mindful eating (Hulburt-Williams et al., 2014), as well as measures of overeating dysregulation, dietary restraint, emotional eating, and external eating, core components emerged indicating a complex structure to these measures (Kerin et al., 2019). In the first exploratory factor analysis, three subscales loaded positively on a component called *attuned eating* (Intuitive Eating for Physical Other Than Emotion Reason, Mindful Acting With Awareness, and Mindful Presence While Eating), and others loaded positively on the other three components called *unrestrained eating* (two subscales of Intuitive Unconditional Permission to Eating, Mindful Acceptance), *eating and hunger awareness* (mindful awareness) and *casual eating attitudes* (two subscales of Mindful Nonreactivity and Flexibility).

## Measurement of Intuitive and Mindful Eating

### Intuitive Eating

We could not locate any behavioral, clinical interviews, or observational measures of intuitive eating. However, three self-report measures have been developed, all called the Intuitive Eating Scale (IES). These are the IES-H (Hawks et al., 2004), the IES-T (Tylka, 2006), and the IES-2 (Tylka & Kroon Van Diest, 2013). The IES-H was the first available measure of intuitive eating, but this measure had low internal and test-retest reliability across multiple subscales and the overall scale had weak criterion validity. Consequently, the IES-T (Tylka, 2006) and its revision – the IES-2 (Tylka & Kroon Van Diest, 2013) – improved on the IES-H, with the first designed to measure three components, but the IES-2 designed to measure four components of intuitive eating: (1) eating for physical rather than emotional reasons; (2) permitting oneself to eat unconditionally (i.e., no food restriction or elimination); (3) relying on internal hunger and satiety cues to guide food intake; and (4) making food choices that enhance body functioning (body-food choice congruence).

The newer 23-item (seven negatively and 16 positively worded items) IES-2 is the currently preferred measure containing eight items to measure eating for physical rather than emotional reasons (e.g., “I find myself eating when I am stressed out, even when I’m not physically hungry,” reversed); six items to measure unconditional permission to eat (“I have forbidden foods that I don’t allow myself to eat,” reversed); six items to measure reliance on internal hunger/satiety cues (e.g., “I trust my body to tell me how much to eat”); and three items to measure body-food choice congruence (e.g., “I mostly eat foods that make my body perform efficiently [well]”). Respondents rate their agreement with each item on a scale from 1 = *strongly disagree* to 5 = *strongly agree*. After reversing the seven negatively worded items, items are averaged or summed to produce four subscale scores, with higher scores indicating more intuitive eating. These four subscales may then be averaged or summed to form an overall intuitive eating composite score.

In a series of three studies (Tylka & Kroon Van Diest, 2013), the IES-2 demonstrated good internal reliability in both women and men. The original exploratory development sample consisted of 1,405 women and 1,195 men attending a Midwestern USA university (aged 18 to 56 years,  $M_{age} = 20.4$ ,  $SD = 5.2$ ; 76 % were in their first year of university), revealing Cronbach’s  $\alpha$ s for all 23 items of .87 for women and .89 for men. Additional studies have also reported similar internal reliability across adult and university student populations and reported adequate test-retest reliability, and good criterion validity through positive correlations with positive affect, well-being, and life satisfaction and inverse correlations with eating disorder symptomology and body dissatisfaction (Duarte et al., 2016; Madanat et al., 2020; Saunders et al., 2018; Strodl et al., 2020). The IES-T and the IES-2 have been translated to, and the factor structure replicated in, for example, French (Camilleri et al., 2015), Hungarian (Román et al., 2021), Malay (Swami et al., 2020), Romanian (Vintilă et al., 2020), Turkish (Bas et al., 2017), and German (Ruzanska & Warschburger, 2017; Van Dyck et al., 2016).

## Mindful Eating

We could not locate any behavioral, clinical interviews, or observational measures of mindful eating. Although a plethora of self-report measures have been developed to measure general trait or state mindfulness (e.g., Mindful Attention Awareness Scale, MAAS; Brown & Ryan, 2003; Five Facet Mindfulness Questionnaire; Baer et al., 2008), only four have been designed to assess mindful eating: the Mindful Eating Questionnaire (MEQ; Framson et al., 2009), the Mindful Eating Scale (MES; Hulbert-Williams et al., 2014), the Mindful Eating Inventory (MEI; Peitz et al., 2021), and the Mindful Eating Behavior Scale (MEBS; Winkens et al., 2018). Table 6.1 provides a summary of the sampling and final measures from these mindful eating measurement development studies.

### Mindful Eating Questionnaire

The MEQ was influential in moving forward research on mindful eating and was designed to align with “nonjudgmental awareness of physical and emotional sensations associated with eating” (Framson et al., 2009, p. 1439). Initial development and validation were completed with a sample of 303 individuals, and after exploratory factor analysis, five factors (28 items) were identified as described in Table 6.1. Respondents rate the frequency with which each item applies to them on a 4-point scale from 1 = *never/rarely* to 4 = *usually/always*. A *not applicable* response is also an option and is excluded from total score calculations. Total scores for each subscale are computed by averaging items on each subscale, and the five subscale scores can also be averaged to produce a total MEQ score. However, Framson et al. (2009) reported a Cronbach’s  $\alpha$  for the full MEQ of .64 suggesting some measurement improvements may be needed, but the proposed divergence of dieting from mindful eating was supported by a negative association between cognitive restraint and MEQ score. The MEQ has been used in many studies since its development (e.g., Beshara et al. 2013; Bryan, 2016; Mantzios & Egan, 2018; see Peitz et al., 2021 for more information) and a short 20-item version with two subscales (Awareness, Cronbach’s  $\alpha$  = .75; Recognition of Hunger and Satiety Cues, Cronbach’s  $\alpha$  = .83) has been developed (Clementi et al., 2017).

### Mindful Eating Scale

In developing the MES (Hulbert-Williams et al., 2014) items from general mindfulness measures, which were pooled and revised to be specific to eating, were completed by 127 university students using response options from 1 = *never* to 4 = *usually*. Exploratory factor analysis was applied to narrow the items to a final set of 28 (22 are reverse scored), with items loading highly on six factors, as described in Table 6.1: acceptance, awareness, non-reactivity, routine, act with awareness, and unstructured eating. Five of the six Cronbach’s  $\alpha$ s for the subscales were .75 or higher, and  $\alpha$  ranged from .60 (Unstructured Eating) to .89 (Acceptance). In Kerin et al. (2019), Cronbach  $\alpha$ s were .72 or higher across all subscales in a sample of  $N=2018$  Australian females ( $M_{\text{age}}=23.1$  years,  $SD=8.7$ ). Total scores for each subscale are calculated by summing the items. Although a total MES score can be calculated, the Cronbach’s  $\alpha$  for all 28 items was not reported in Hulbert-Williams et al. (2014) and the procedure for forming this composite was not described. In the de-

**Table 6.1.** Measures of mindful eating (in order of publication date)

| Title of measure                   | Lead author/<br>year          | Sample                                                                                     | Correlates                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | # items; components measured and reliability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mindful Eating Questionnaire (MEQ) | Framson et al., 2009          | 313 adults.<br>81 % female.<br>Age 18–80 years;<br>$M_{age} = 42$ ,<br>$SD_{age} = 14.4$ . | MEQ total score and most subscales had significant positive associations with yoga practice and age, and significant negative associations with body mass index. All MEQ subscales had significant negative associations with cognitive restraint. MEQ total score was not significantly associated with sex or race.                                                                                                                                                               | 28 items, 5 subscales<br>1. Disinhibition (8 items; e.g., "I stop eating when I'm full even when eating something I love")<br>2. Awareness (7 items; e.g., "I notice when there are subtle flavors in the foods I eat")<br>3. External Cues (6 items; e.g., "I recognize when food advertisements make me want to eat")<br>4. Emotional Response (4 items; e.g., "When I'm sad I eat to feel better")<br>5. Distraction (3 items; e.g., "My thoughts tend to wander while I am eating")<br>Internal reliability ranged from .64 for distraction to .83 for disinhibition. Cronbach's $\alpha$ for the full 28 items was .64.                                                                                                                           |
| Mindful Eating Scale (MES)         | Hulbert-Williams et al., 2014 | 127 university students.<br>77 % female.<br>$M_{age} = 22.7$ ,<br>$SD_{age} = 8.9$ .       | MES total score and all subscales except routine had significant positive associations with generic mindfulness. The MES total scores and the subscales of acceptance, routine, and act with awareness had significant negative associations with disordered eating. MES total score was not significantly associated with body mass index, but the MES subscale of acceptance had a significant negative association and the MES subscale of awareness had a positive association. | 28 items, 6 subscales<br>1. Acceptance (6 items; e.g., "I criticize myself for the way I eat," reversed)<br>2. Awareness (5 items; e.g., "I notice flavours and textures when I'm eating my food")<br>3. Non-reactivity (5 items; e.g., "I can tolerate being hungry for a while")<br>4. Routine (4 items; e.g., "I have a routine for what I eat," reversed)<br>5. Act with Awareness (4 items; e.g., "I snack without being aware that I'm eating," reversed)<br>6. Unstructured Eating (4 items; e.g., "I multi-task whilst eating," reversed)<br>5 of the 6 Cronbach's $\alpha$ for the subscales were .75 or higher, and $\alpha$ ranged from .60 (Unstructured Eating) to .89 (Acceptance).<br>Can exclude the 6th factor given low reliability. |

Table 6.1. continued

| Title of measure                     | Lead author/ year     | Sample                                                                                                                                                                                     | Correlates                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | # items; components measured and reliability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mindful Eating Behavior Scale (MEBS) | Winkens et al., 2018. | 1,227 adults, 52% female. Age 55 years or over; $M_{age} = 68.8$ , $SD_{age} = 8.1$ .                                                                                                      | All subscales except hunger and satiety cues had significant positive associations with life satisfaction, general self-regulation, and self-esteem. All subscales except hunger and satiety cues had significant negative associations with depressive symptoms, difficulty identifying feelings, and body mass index. There were mixed associations of MEBS subscales with external eating and restrained eating. Measurement invariance was supported for sex, age, and body mass index.                                                                                                                                                                                                                                                                | 17 items selected from the MIES, MEQ & IES-2. Narrowed items to focus on attention only, 4 subscales<br>1. Focused Eating (5 items; e.g., "I notice how my food looks")<br>2. Hunger and Satiety Cues (5 items; e.g., "I trust my body to tell me how much to eat")<br>3. Eating With Awareness (3 items; "I eat automatically without being aware of what I eat," reversed)<br>4. Eating Without Distraction (4 items; "I think about things I need to do while I am eating," reversed)<br>Cronbach's $\alpha$ was .85 for Focused Eating, .89 for Hunger and Satiety Cues, .81 for Eating With Awareness, and .70 for Eating Without Distraction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Mindful Eating Inventory (MEI)       | Peitz et al., 2021    | Study 2:<br>837 adults, 79% female. Age 18–77 years; $M_{age} = 34.6$ , $SD_{age} = 11.5$ .<br>Study 3:<br>612 adults, 79% female. Age 18–75 years; $M_{age} = 35.5$ , $SD_{age} = 11.6$ . | Study 2:<br>All subscale scores were significantly negatively associated with loss of control eating. Meditators had a significantly higher MEI total score than nonmeditators. Men had a significantly higher MEI total score than women.<br>Study 3:<br>MEI total score had significant positive associations with generic mindfulness, intuitive eating, weight-related self-efficacy, eating motives of "need and hunger" and "health," and mental well-being. MEI total score had significant negative associations with food cravings and psychological distress. Meditators had a significantly higher MEI total score than nonmeditators. Men had a significantly higher MEI total score than women. Measurement invariance was supported for sex. | 30 items, 7 subscales<br>1. Accepting and Non-attached Attitude Towards One's Own Eating Experience (5 items; e.g., "I feel guilty after eating something 'unhealthy,' forbidden, or 'high-caloric,'" reversed)<br>2. Awareness of Senses While Eating (5 items; "I'm fully aware of the smells and aromas of my food")<br>3. Eating in Response to Awareness of Fullness (5 items; "I stop eating when I'm full, even if my plate is not empty yet")<br>4. Awareness of Eating Triggers and Motives (4 items; e.g., "I'm able to notice if I'm physically hungry or if I want to eat for other reasons [e.g., boredom, habit, availability, etc.]")<br>5. Connectedness (3 items; e.g., "While I'm eating, I make myself aware of who and what were part of the origin and the production of this food [e.g., rain, sun, living beings, harvest, etc.]")<br>6. Non-reactive Stance (4 items; e.g., "When I see or smell something tasty, I have to eat it," reversed)<br>7. Focused Attention on Eating (4 items; e.g., "While I eat, I keep my whole attention focused on my food")<br>Cronbach's $\alpha$ ranged from .73 to .92 for the subscales and was .92 for all 30 items; good test–retest reliability. |

velopment study, good criterion validity was demonstrated with moderate positive correlations of most MES subscales and the MES total score with mindful awareness (measured with the MAAS). Criterion validity of MES subscales and the total score was also supported through significant inverse correlations with perfectionism, body dissatisfaction, and eating disorder symptoms.

### **Mindful Eating Inventory**

In their rigorous approach to developing the MEI, Peitz et al. (2021) described using expert opinion, focus groups, layperson opinion, think aloud protocols, and two large survey studies involving 828 and 612 participants. In this development study, the MEI was produced in German and translated to English for publication. Following a thorough assessment of items and multiple steps (Study 1), a final set of 30 items was retained, with items loading highly ( $>.40$ ) on seven factors (Study 2  $N=828$ ). As described in more detail in Table 6.1, the factors were (1) accepting and nonattached attitude towards one's own eating experience, (2) awareness of senses while eating, (3) eating in response to awareness of fullness, (4) awareness of eating triggers and motives, (5) connectedness, (6) non-reactive stance, and (7) focused attention on eating. Twelve of the 30 items are reversed scores and are spread across the majority of the factors. Respondents rate the degree to which each item applies to them on a 6-point scale from 1 = *almost never* to 6 = *almost always*. Subscale scores are derived by averaging the items on each subscale, and a total score may be calculated by averaging the scores on all 30 items. As described in Table 6.1, Cronbach's  $\alpha$  ranged from .73 to .92 for the subscales and was .92 for all 30 items. In the third study reported in Peitz et al. (2021,  $N=612$ ), criterion validity was established with most MEI subscales and the total score demonstrating moderate to strong positive correlations with, for example, measures of intuitive eating (ranging from  $r=.25$  for connectedness to  $r=.72$  for the total MEI score), eating-related self-efficacy, and well-being. Further supporting criterion validity, most MEI subscales and the total score had strong negative correlations with, for example, loss of control over eating and food cravings, and moderate negative correlations with psychological distress.

### **Mindful Eating Behavior Scale**

The MEBS (Winkens et al., 2018) was derived from 20 items selected from the MEQ, MES, and the IES-2 to focus specifically on the "attention" component of mindfulness and to better differentiate mindful eating from external and emotional eating. Using exploratory and confirmatory structural equation modeling, four factors (17 items), as described in Table 6.1, were maintained including focused eating, hunger and satiety cues, eating with awareness, and eating without distraction. Respondents rate the degree to which each item applies to them on a 6-point scale from 1 = *never* to 6 = *very often*. Seven of the 17 items are reversed scored and are located on the eating with awareness and eating without distraction subscales. Subscale scores are derived by summing the items on each subscale. Cronbach's  $\alpha$  of .85 for focused eating, .89 for hunger and satiety cues, .81 for eating with awareness, and .70 for eating without distraction were reported. In Winkens et al. (2018), scores on the MEBS subscales tended to have the expected associations with multiple measures of general stress and well-being, as well as having the expected asso-

ciations with participants' reports of their difficulties identifying and describing feelings and with their reports on other eating measures. However, unanticipated positive associations of some MEBS mindful eating subscales with eating problems were reported, which does not support validity. Specifically, a positive association was found between the MEBS subscale of Focused Eating and a measure of restrained eating; and between the MEBS subscale of Hunger and Satiety Cues and a measure of external eating.

## Conclusions

Three self-report questionnaire measures of intuitive eating (IES-H, Hawks et al., 2004; IES-T, Tylka, 2006; and IES-2, Tylka & Kroon Van Diest, 2013) and four measures of mindful eating (MEQ, Framson et al., 2009; MES, Hulbert-Williams et al., 2014; MEI, Peitz et al., 2021; and MEBS, Winkens et al., 2018) can be found in the research literature. Fortunately, the most recently developed measures appear to all align with definitions and have good breadth of content. In addition, the most recently developed measures and improvements on other measures are using rigorous methodological approaches to development. At this point in time, we recommend using the IES-2 (Tylka & Kroon Van Diest, 2013) to measure intuitive eating and the MEI (Peitz et al., 2021) to measure mindful eating. However, more research is certainly needed to consider covariation and incremental validity of measures within a single study, and the MEI, in particular, awaits additional use in research to understand health impact, individual differences and correlates, development, and relevance to studying intervention outcomes. Regardless, most of the identified measures (or published refinements of these measures) are supported by good psychometric data and the selection of a measure will always depend on research aims. Overall, also, intuitive and mindful eating do share conceptual space, and future research would be welcome that highlights similarities and differences, especially to further delineate differences between attuned versus disinhibited or restrained eating patterns and dieting. This could be done by considering other potentially related (sometimes inversely) concepts such as overeating regulation (Kerin et al., 2018, 2019) and emotional eating (Strien et al., 1986, 2012).

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