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Development and initial validation evidence for a mindful eating questionnaire for children

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ABSTRACT

Mindful eating interventions have become a focus among health professionals, which warrants a need for a psychometrically solid assessment tool. The current study outlines the development and initial validation of the Mindful Eating Questionnaire (MEQ) adapted for Children (MEQ-C). Participants included 262 third through fifth grade students (53% female, 57% white, non-Hispanic) who participated in a mindful eating intervention *Foodie U*. Data was also collected from 140 parents. Exploratory factor analysis delineated two factors (Awareness and Mindless Eating). Test-retest analysis with a subsample (n = 93) indicated moderate correlations for both factors. The two subscales have good construct validity and can be utilized in an exploratory sense for mindful eating interventions among children. Specifically, the eight-item mindless eating subscale has good internal consistency reliability and can independently be used as a questionnaire to assess overall mindless eating practices among children. Further research is needed to explore and better understand domains of mindful eating among children besides awareness.

1. Introduction

Interventions focusing on mindful eating are a relatively new focus of preventive interventions to address problematic, and promote healthy, eating behaviors in this population. The current study attempts to add to the literature by providing initial validation evidence for a way to measure mindful eating behaviors in children.

The high prevalence of obesity among young children has been a major public health concern. Physical and medical consequences of obesity in children have been widely established, such as diabetes, sleep apnea, polycystic ovarian syndrome, and cardiovascular disease. Additionally, obesity has psychological and emotional correlates, including (but not limited to) body dissatisfaction and peer rejection (see Sahoo et al., 2015 for a review). Forty percent of overweight children continue with weight challenges in adolescence, and 75–80% of obese adolescents have been shown to become obese adults. Addressing obesity in children and youth therefore is imperative.

Unhealthy food behaviors have been identified as factors contributing to poor health outcomes. Research has shown that unhealthy food behaviors such as binge eating, emotional eating and disconnection from internal hunger and fullness cues are often traced back to late childhood (Abbott et al., 1998). It has been established that clinically diagnosable eating disorders begin to manifest around the time of puberty, typically around the age of 12 (Furnham, Badmin, & Sneade, 2002; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011). There is an advantage to understanding these types of unhealthy eating behaviors on a continuum. For example, Stice, Marti, Shaw, and Jaconis (2009) demonstrated that 12% of adolescents experience disordered eating somewhere on the continuum between subthreshold levels of disordered eating and diagnosable eating disorders, with approximately 13–17% of those exhibiting subthreshold levels moving on to develop a diagnosable eating disorder. These authors indicated that subthreshold levels of disordered eating were associated with more impairment, higher treatment needs, and elevated distress. While this is an emerging area of research, these authors have highlighted that there are consequences of subthreshold levels of disordered eating and these levels are important to attend to.

Once established, disordered eating tends to continue through adulthood and is incredibly challenging to treat clinically (Furnham et al., 2002; Swanson et al., 2011). Additionally, problematic eating behaviors—such as disinhibited eating or eating in the absence of hunger—not otherwise typically included in the literature for the construct of disordered eating and yet associated with deleterious outcomes such as excess body weight and dietary restraint (Shunk & Birch, 2004), have also been shown to be stable traits (Birch, Fisher, & Davison, 2003; Fisher & Birch, 2002). Therefore, the impetus on

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clinicians to treat these issues before they are fully established is paramount.

There is a growing interest among nutrition and health professionals to examine the mindful eating approach to change food behaviors. In general, mindfulness strategies encourage individuals to actively attend to the present moment, while being non-judgmentally aware and accepting one's experience (Kabat-Zinn, 1990). The mindful eating approach focuses on paying purposeful attention to body-related sensations and to thoughts and feelings about food (Alberts, Thewissen, & Raes, 2012). This awareness and acceptance may lead to a decrease in disinhibited and emotional eating. Additionally, it is believed that central to development of a healthy body image is accepting oneself (Golan, Hagay, & Tamir, 2013). Perhaps one of the most robust psychological risk factors associated to eating psychopathology is body image dissatisfaction (Ferreiro, Seoane, & Senra, 2011), and therefore, the goal of these techniques in the context of body dissatisfaction centers around the encouragement of self-acceptance of oneself (Stewart, 2004). Five principles of mindful eating have been discussed: a) reducing eating rate, b) assessing hunger and satiety cues, c) reducing portion size, d) reducing distractions while eating, and e) savoring food (Monroe, 2015).

Research is starting to accumulate in support of the relationship between mindful eating and health variables as well as the effectiveness of mindfulness on problematic outcomes and more specifically for mindful *eating* interventions. In a recent review for which twenty-one articles were included, a variety of mindfulness interventions were described such as combined mindfulness and cognitive behavioral therapies, mindfulness-based stress reduction, acceptance-based therapies, mindful eating programs, and other combinations of mindfulness exercises (O'Reilly, Cook, Spruijt-Metz, & Black, 2014). These authors concluded that mindfulness-based interventions had a positive effect on targeted obesity-related eating behaviors including binge eating, emotional eating, external eating, and dietary intake for adults.

Mason et al. (2016) randomly assigned 194 obese adults to a diet-exercise program with or without mindfulness training. These researchers demonstrated that mindfulness-based interventions increased mindful eating, decreased reduction in the eating of sweets, and decreased fasting glucose, with results continuing into a one year follow-up. Additionally, mindful eating partially mediated the relationship of intervention group and decreased fasting glucose. Taylor, Daiss, and Krietsch (2015) established that higher self-compassion predicted higher mindful eating and lower eating disorder symptomatology in 150 college students, leading authors to encourage development of self-compassion mindful eating programs that focus on improving body image, reducing eating disorder symptomatology, decreasing mindless eating, and preventing weight gain.

Mindful eating research with adults is more prevalent than with children and adolescents. However, Hendrickson and Rasmussen (2017) recently included 172 adolescents and 176 adults to examine mindful eating and impulsive food choices. Participants were randomly assigned to complete a mindful eating intervention, watch a video on nutrition, or act as a control. Both adults and adolescents with a high percentage of body fat were more impulsive for food than those with low percentage of body fat. Adults with a high percentage of body fat also evidenced more impulsivity regarding money, while for adolescents they did not indicate differences related to impulsiveness for money based on body fat. Those who participated in the mindful eating intervention demonstrated specific improvements in impulsivity related to food but not money.

With a focus on mindful eating interventions, it is crucial to have reliable and valid tools to measure the change the interventions are targeting. Framson et al. (2009) developed and evaluated a mindful eating questionnaire (MEQ) in order to rigorously measure mindful eating in adults. The MEQ was developed and initially validated with 303 primarily female (81%), Caucasian (90%) adults (M = 42 ± 14.4 years). Five subscales were originally identified: Disinhibition, Awareness, External Cues, Emotional Response, and Distraction. An overall scale score was found to be inversely associated with body mass index and positively correlated with yoga practice (Framson et al., 2009).

More recently, L. Hulbert-Williams, Nicholls, Joy & N Hulbert-Williams (2014) developed another measure, the Mindful Eating Scale (MES) for use with adults. Prior to development of the MES, the MEQ was the only specific mindful eating scale and therefore remains the most common used in the research for adults. L. Hulbert-Williams, Nicholls, Joy, and Hulbert-Williams (2014) pooled and adapted items from two mindfulness questionnaires to reflect eating-related behaviors. Initial validation evidence was provided with 127 primarily female (77.2%) Caucasian (85%) college students (M = 25.65 ± 8.89 years). Six factors were identified: Acceptance, Awareness, Non-Reactivity, Routine, Act with Awareness, and Unstructured Eating. Correlations with existing measures of mindfulness, acceptance, and eating disorder symptoms were in the expected directions. Problematic to this validation effort is the low 1.72:1 sample to item ratio (127:74), a proportion that is far lower than ratios recommended in the literature of 10:1 (Costello & Osborne, 2005).

As noted, there is limited information regarding the effectiveness of mindful eating interventions among children, possibly due to the lack of instruments to measure mindful eating among children. Importantly, in their study of mindful eating intervention with adolescents and adults, Hendrickson and Rasmussen (2017) did not include a mindful eating measure, perhaps because, to date, there are no mindfulness eating measures developed specifically for children and adolescents. This article attempts to add to the literature by reporting on the development and evaluation of a mindful eating questionnaire for children (MEQ-C).

2. Materials and methods

2.1. Participants

The current study was conducted with children and their parents participating in *Foodie U,* which was a mindful eating intervention project of the Agricultural and Food Research Initiative (AFRI) program funded through the United States Department of Agriculture (USDA) (Pierson et al., 2016). A total of 305 third, fourth, and fifth grade students from two elementary schools participated in the study. Due to data missing on all MEQ-C indicator variables, the sample for the EFA procedures was $n = 262$. Table 1 displays demographic data for the full sample and subgroups based on grade. Students from both intervention (57%) and control (43%) schools were chosen for this study. One hundred forty parents/guardians returned the parent survey. They were primarily female (86%) with various age groups (43% were 18–34 yrs, 51% were 35–54 yrs). Some additional demographic variables for the parent and family characteristics are found in Table 1. The Human Subjects Research Committee of California State University, Chico

Table 1
Demographic data for full sample and subgroups.

Frequencies	Full Sample *n* (%)	3rd *n* (%)	4th *n* (%)	5th *n* (%)
Full Sample	305 (100%)	100 (32.6%)	119 (38.8%)	86 (28.0%)
Male	140 (45.6%)	44 (44.0%)	59 (49.6%)	37 (43.0%)
Caucasian	172 (56.0%)	55 (55.0%)	65 (54.6%)	52 (60.5%)
English	148 (48.2%)	48 (48.0%)	41 (34.5%)	59 (68.6%)
Guard Coll	106 (34.5%)	28 (28.0%)	33 (27.7%)	45 (52.3%)
≥3 Child	119 (38.7%)	34 (34.0%)	40 (33.6%)	45 (52.4%)

Note. English = English reported as language spoken in the home reported by guardian. Guard Coll = Guardian self-reported highest level of education as some college, college graduate, or graduate-level college. ≥3 Child = 3 or fewer children living in the home as reported by guardian; this number was chosen as it reflected the number associated with the 50th percentile for the overall sample.