THE RELATIONSHIP OF DISPOSITIONAL MINDFULNESS, EMOTION REGULATION, AND BODY APPRECIATION TO INTUITIVE EATING IN FEMALE EMERGING ADULTS

By

MARIA HOWELL

Bachelor of Arts in Psychology
St. Petersburg Academy of Graduate Education
Moscow, Russia
2005

Master of Arts in Clinical Psychology
Russian New University
Moscow, Russia
2010

Master of Science in Educational Psychology
Oklahoma State University
Stillwater, OK
2010

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Dissertation Approved:

Hugh Crethar, PhD

Dissertation Chair

Diane Montgomery, PhD

Dissertation Adviser

Sue Jacobs, PhD

Randolph Hubach, PhD

DeMond Grant, PhD

.

Name: MARIA V. HOWELL

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Abstract:

Intuitive eating is an adaptive non-dietary eating behavior associated with multiple beneficial outcomes (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). Although body appreciation is a confirmed strong predictor of intuitive eating, research is needed to identify other intrapsychological contributors to this adaptive eating behavior. The current study used theories of mindfulness, emotion regulation, and intuitive eating to examine the contribution of dispositional mindfulness, habitual use of emotion regulation strategies, and body appreciation to intuitive eating in a sample of 394 female emerging adult college students (mean age 21 years, *SD*=1.88). Hierarchical regression analyses were conducted to test the study hypotheses. Body Mass Index (BMI) was used as a confounding variable in all regression analyses. Findings indicated that similar to the acceptance model of intuitive eating, body appreciation was the strongest contributor to the variance in intuitive eating. Unidimensional mindfulness accounted for a unique variance in intuitive eating over and above the contribution of body appreciation and emotion regulation strategies. As a set, emotion regulation strategies also emerged as a significant predictor of intuitive eating after accounting the variance explained by body appreciation and dispositional mindfulness. Only four facets of dispositional mindfulness including non-judging, non-reactivity, describing, and observing significantly contributed to intuitive eating. Finally, data supported the conceptual model of intuitive eating, where BMI was the most distal contributor to intuitive eating and body appreciation was its most proximal contributor. Based on the primary hierarchical regression analysis, post hoc bootstrapping mediation analysis were conducted. Mediation analysis revealed that the acting with awareness mindfulness facet exerted a medium in magnitude indirect effect on intuitive eating through the non-judging mindfulness facet. Similarly, post hoc mediation analyses examining the mediating role of body appreciation found that dispositional mindfulness and adaptive and maladaptive emotion regulation strategies had a significant medium in magnitude indirect effect on intuitive eating through body appreciation. Additionally, unidimensional mindfulness and maladaptive emotion regulation strategies had a direct effect on intuitive eating. Regardless of its limitations, the results of this study have implications for clinical practice, prevention, mindfulness and intuitive eating theory, and future research.

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CHAPTER I

INTRODUCTION TO THE STUDY

Emerging adulthood (18 to 29 years of age) is marked by various developmental challenges including formation of identity, establishment of relationships, and transition to adult life style (Arnett, 2000, 2007). Female university students of this age experience higher levels of psychological distress and more mental health problems than their male peers and their non-academic counterparts (Baghurst & Kelley, 2014; Egan & Moreno, 2011; Stallman, 2010), associated with emotional eating and binge eating (Sulkowski, Dempsey, & Dempsey, 2011; Wolff, Crosby, Roberts, & Wittrock, 2000) followed by weight gain (Anderson, Shapiro, & Lundgren, 2003; Butler, Black, Blue, & Gretebeck, 2004; Economos, Hildebrandt, & Hyatt, 2008). For college women weight gain is often associated with increased body dissatisfaction and unhealthy weight control methods such as dieting, skipping meals, using laxatives, and fasting (e.g., Costarelli, Demerzi, & Stamou, 2009; Delinsky & Wilson, 2008; Girz et al., 2013; White, Reynolds-Malear, & Cordero, 2011). Moreover, concerns about body shape and size also develop when young women repeatedly compare their own appearance to the appearance of their peers on social networks and to unrealistic body ideals presented by conventional media (Cohen, & Blaszczynski, 2015; Tylka & Subich, 2004; Walker et al, 2015), or when their peers, dating partners, and family members pressure them to achieve unrealistic expectations for weight and shape (Keel, Forney, Brown, & Heatherton, 2013; Eisenberg, Berge, & Neumark-Sztainer, 2013; Tylka & Subich, 2004). Research suggests that over the last decade more and more college female students have been experiencing poor body image accompanied by disordered eating and

unhealthy weight regulation behaviors (Juarascio, Perone, Timko, 2011; McVey et al., 2010; Tylka, 2004; Tylka & Hill, 2004; Tylka & Sabik, 2010). Given the high rates of disordered eating behaviors among emerging adult women, conducting research studies relevant for prevention of disordered eating and weight gain, promotion of adaptive eating behaviors, and development of weight-inclusive weight maintenance approach for this population is deemed warranted (Gow, Trace, & Mazzeo, 2010; Stice, Rohde, Shaw, & Marti, 2012, 2013; Tylka et al., 2014; Wilksch, 2014).

Background to the Research Problem

For many years, research on eating behaviors has been mainly conducted in the area of eating pathology (Avalos, Tylka, & Wood-Barcalow, 2005; Tylka, 2006) with little emphasis on adaptive eating style in healthy individuals (Crago, Shisslak, & Ruble, 2001). While focusing on disordered eating behaviors and symptoms of clinical eating disorders is essential for improving treatment interventions and developing programs in prevention of disordered eating behaviors, it is also equally important to explore factors that may help individuals develop healthy eating habits (Avalos et al., 2005; Piran, 2015; Stice, Shaw, & Marti, 2007; Tylka, 2006). Thus, the aim of this study was to examine a combination of intrapsychological processes contributing to an adaptive intuitive eating style in female emerging adults. Suggested explanatory processes associated with intuitive eating comprised unidimensional and multifaceted dispositional mindfulness, habitual use adaptive and maladaptive strategies of emotional regulation, and body appreciation. These variables were discussed with detailed information in Appendix A-Literature Review.

Intuitive Eating as an Adaptive Eating Behavior

In recent years, following fundamental principles of counseling and positive psychology emphasizing well-being, strengths, resilience, and health (Gelso & Frets, 2001; Seligman, 2008; Steck, Abrams, & Phelps, 2004), a group of researchers has shifted focus to *intuitive eating*, a health-related adaptive eating behavior conceptualized as a construct containing unique components not

present in the eating disorder continuum (Tylka, 2006; Tylka & Wilcox, 2006). Intuitive eating, a non-diet eating style, initially popularized by Tribole and Resch (1996) and further researched, conceptualized, and operationalized by Tylka (2006), has been characterized by a strong physical connection with the body and a low preoccupation with food. Individuals who eat intuitively, connect with and trust in their internal physiological hunger and satiety cues, eat in response to these cues rather than in response to external and emotional cues, give themselves an unconditional permission to eat foods desired at the moment regardless of their nutrient or caloric content, accept all foods without categorizing them into "good" or "bad", and give preference to foods that honor health and body functioning, increase stamina, and improve body performance (Tribole & Resch, 1996; Tylka, 2006; Tylka & Kroon Van Diest, 2013).

Recent empirical studies have supported adaptive properties of intuitive eating (for review, see Bruce & Ricciardelli, 2016; Van Dyke & Drinkwater, 2014). Researchers have revealed that those who eat intuitively have lower odds of developing disordered eating cognitions related to negative body image (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh, Wiseman, Hendrickson, Phillips, & Hayden, 2012; Tylka, 2006; Tylka & Kroon Van Diest, 2013), disordered eating symptomatology (Tylka, 2006; Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006; Tylka, Calogero, & Daníelsdóttir, 2015), and maladaptive eating patterns such as emotional eating, external eating, restrained eating, dieting (Evers, Stok, & de Ridder, 2010; Herman & Polivy, 1980; Pfattheicher & Sassenrath, 2014; Van Strien, Herman, & Verheijden, 2009), and other extreme weight control practices (Camilleri et al., 2015; Tylka, 2006; Tylka & Kroon Van Diest, 2013). Furthermore, general benefits of intuitive eating have been associated with increased life satisfaction, optimism, self-esteem, and self-compassion (Schoenefeld & Webb, 2013; Tylka, 2006; Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006). Intuitive eating has been associated with indices of healthy emotional functioning including higher levels of positive affect, lower levels of self-silencing, higher awareness and acceptance of emotions, higher distress tolerance, higher use of proactive

coping and social problem solving skills (Shouse & Nilsson, 2011; Schoenefeld & Webb, 2013; Tylka, 2006; Tylka et al., 2015; Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006). Much of the current literature has paid particular attention to the association of intuitive eating with positive body image processes, attitudes, and behaviors such as body appreciation and body satisfaction, focus on body function rather than appearance, and resistance to an observer's perspective of the body (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Dittmann & Freedman, 2009; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Tylka et al., 2015; Tylka & Kroon Van Diest, 2013), as well as interoceptive awareness (Herbert, Blechert, Hautzinger, Matthias, & Herbert, 2013; Tylka, 2006; Tylka, Calogero, et al., 2015; Tylka & Kroon Van Diest, 2013).

With regard to its associations with physical health, Avalos and Tylka (2006) suggested that women with lower body weight receive more body acceptance from others, and, therefore, are more likely to appreciate their bodies and to eat more intuitively. Indeed, several intuitive eating studies have found that women with lower body mass index (BMI) tend to rely on their internal hunger and satiety cues and to eat intuitively (Augustus-Horvath & Tylka, 2011; Denny, Loth, Eisenberg, & Neumark-Sztainer, 2013; Oh et al., 2012; Kroon Van Diest & Tylka, 2010; Tylka, 2006; Tylka & Kroon Van Diest, 2013; Schoenefeld & Webb, 2013). This may be explained by the fact that in today's Western culture, women with higher body weight frequently internalize the thin ideal (Brown & Dittmar, 2005; Buote, Wilson, Strahan, Gazzola, & Papps, 2011; Thompson & Stice, 2001), are more dissatisfied with their bodies (Conley & McCabe, 2011; Girz et al., 2013), are less appreciative of their bodies (Augustus-Horvath & Tylka, 2011; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Tylka & Kroon Van Diest, 2013), and are more likely to use unhealthy weight control methods such as dieting, skipping meals, using laxatives, and fasting (e.g., Costarelli et al.; 2009; Delinsky & Wilson, 2008; Girz et al., 2013; Stice, 1998; White et al., 2011).

Importantly intuitive eating may be trained using non-diet approaches such as the original intuitive eating intervention (Tribole & Resch, 2012), the The Eat for Life intervention (Bush et al.,

2014), the My Body Knows When intuitive eating program (Cole & Horacek, 2010), the Health at Every Size program (HAES; Bacon et al., 2002; Carbonneau et al., 2017; Gagnon-Girouard et al., 2010; Provencher et al., 2007; Leblanc et al., 2012), and the Mind, Body, Food web-based weight gain prevention intervention (Boucher et al., 2016).

Trying to explain the entire mechanism of intuitive eating style, Tylka and her colleagues (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Tylka & Wilcox, 2006) have proposed and developed the acceptance model of intuitive eating drawn from humanistic person-centered (Rogers, 1961) and feminist body objectification theories (Fredrickson & Roberts, 1997), and rooted in the positive psychology framework (Seligman & Csikszentmihalyi, 2000). According to this model, women are more likely to eat intuitively if they receive more social support (Augustus-Horvath & Tylka, 2011), experience general unconditional acceptance from significant people in their life (Avalos & Tylka, 2006), or perceive unconditional acceptance of their bodies from others (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh et al., 2012). Women also tend to eat more intuitively if they emphasize how their bodies function and feel internally rather than how they look externally (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006), resist observer's perspective of their bodies, and appreciate their bodies taking care of their bodies' needs (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Kroon Van Diest & Tylka, 2010; Tylka, 2006; Tylka & Homan, 2015). Researchers have found that women with higher body appreciation are able to eat intuitively even when they receive restrictive/critical caregiver eating messages or perceive that others do not accept their bodies (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Oh et al., 2012).

Although researchers have provided substantial empirical support for the acceptance model of intuitive eating among various age groups (e.g., Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Oh et al., 2012), the model may be expanded by additional research examining other relevant intrapersonal self-regulatory dispositional patterns of cognitions,

emotions, or behaviors underlying and promoting intuitive eating, such as mindful processing style (Brown, Ryan, & Creswell, 2007; Cook-Cottone, 2015; Vago & Silbersweig, 2012).

Dispositional Mindfulness

Mindfulness is a quality of consciousness often defined as "awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmental to the unfolding of the experience moment by moment" (Kabat-Zinn, 2003, p.145). Although mindfulness may be operationalized as a state, an inherent and enduring trait, and a skill that may be trained through meditation practice or a training intervention (Davidson, 2010; Garland, Geschwind, Peeters, & Wichers, 2015; Greeson, 2009; Greeson, Garland, & Black, 2014; Vago & Silbersweig, 2012) even of a very short duration (Banks, Welhaf, & Srour, 2015; Zeidan, Gordon, Merchant, & Goolkasian, 2010), the focus of present study is mindfulness as a trait, also referred to as *dispositional mindfulness* (Brown et al., 2007). Dispositional mindfulness reflects a natural self-processing capacity to relate to potentially distorted or biased cognitions, emotions, and perceptions as to transient events (Brown et al., 2007; Brown & Ryan, 2003, 2004; Hart, Ivtzan, & Hart, 2013; Teasdale, Moore, Hayhurst, Pope, Williams, & Segal, 2002). Although researchers have not reached a general agreement on structural components of mindfulness (Baer, 2003, 2007, 2011; Bergomi, Tschacher, & Kupper, 2013a, 2013b; Chiesa, 2013; Carmody, 2009), evidence exits that mindfulness may be conceptualized both as a unidimensional construct (Brown & Ryan, 2003; Brown et al., 2007) and a multifaceted structure with several distinct components (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bergomi et al., 2013a; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). Present-moment awareness and nonjudgmental attitude are generally thought to be the primary components contributing to psychological well-being, with nonjudgmental attitude being the quality of sustained present-moment awareness (Baer et al., 2006; Bishop et al., 2004; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008; Kabat-Zinn, 2003; Keng et al., 2011; Malinowski, 2013). In cross-sectional research, dispositional mindfulness is often delineated as having five facets: (1) *acting with awareness*, defined

in terms of attending to one's activities of the moment (opposite of acting on automatic pilot); (2) *non-judging of inner experience*, defined in terms of taking a non-evaluative stance toward thoughts and feelings; (3) *describing*, defined in terms of labelling internal experiences with words; (4) *non-reactivity to inner experience*, defined in terms of allowing thoughts and feelings to come and go, without getting caught up in or carried away by them; and (5) *observing*, defined in terms of noticing or attending to internal and external experiences (Baer et al., 2006, 2008). However, only four mindfulness facets except for the *observing* facet may be considered to be clear indicators of dispositional mindfulness construct in non-meditators, as the observing facet has the potential to reflect a pathological use of attention (e.g., judgmental), and, therefore, not contribute to an overarching mindful perspective (Baer et al., 2006, 2008; Curtiss & Klemanski, 2014a; Lilja et al., 2011; Williams, Dalgleish, Karl, & Kuyken, 2014).

According to a significant amount of literature, mindfulness is a universal self-regulatory "transtherapeutic" and "transdiagnostic" process (e.g., Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013; Greeson et al., 2014) associated with numerous adaptive behavioral, psychological, and physical health outcomes for both clinical and normative populations (Arch & Craske, 2010; Bowlin & Baer, 2012; Brown & Ryan, 2003; Brown et al., 2007; Coffey & Hartman, 2008; Greeson, 2009, 2015; Greason & Cashwell, 2009; Greeson et al., 2014; Keng, Smoski, & Robins, 2011; Vago & Silbersweig, 2012). Despite growing evidence for the clinical utility of mindfulness, there is considerable debate in scientific circles over its therapeutic mechanism of action (Malinowski, 2008; Garland, Gaylord, & Park, 2009; Holzel et al., 2011). Existing research on mindfulness includes several psychological and neurocognitive theoretical accounts describing specific mechanisms implicated in the state and trait of mindfulness.

Most of these accounts expound on the central role of attention regulation in mindfulness (Brown & Ryan, 2003; Carmody, 2009; Grabovac et al., 2011; Holzel et al., 2011; Lutz, Slagter, Dunne, & Davidson, 2008; Shapiro et al., 2006; Tang & Tang 2015a, b; Tang, Hölzel, & Posner,

2015) including modification of attentional biases (Malinowski, 2013; Vago & Silbersweig, 2012), and shift of attention to previously unattended positive contextual data (Garland, Farb, et al., 2015a,b). Others accounts have suggested that mindfulness exerts its effect on indices of wellbeing through improved emotional regulation (Chambers, Gullone, & Allen, 2009; Holzel et al., 2011; Shapiro et al., 2006; Tang & Tang 2015b; Tang et al., 2015; Vago & Silbersweig, 2012), use of specific emotion regulation strategies such as positive reappraisal resulting in positively valenced emotional states and positive cognitions (Garland & Fredrickson, 2013; Garland et al., 2011; Garland et al., 2009; Garland, Farb, 2015a, b), enhanced ability to savor and experience reward from positive everyday experiences (Garland et al., 2010; Garland, Farb, et al., 2015a,b; Garland, Geschwind, et al., 2015), and heightened body awareness (Farb et al., 2015; Holzel et al., 2011). Several groups of theorists have identified different components of metacognitive processing of information (Bernstein et al., 2015; Greeson et al., 2014) underlying the beneficial effects of mindfulness including reperceiving, decentering, decreased past or future oriented self-narratives (Garland, Farb, 2015a, b; Shapiro et al.; 2006; Vago & Silbersweig, 2012), self-awareness (Garland, Farb, et al., 2015a,b; Tang & Tang 2015b; Tang et al., 2015; Vago & Silbersweig, 2012), change in perspective on the self (Holzel et al., 2011), and insight (Brown et al., 2007). Moreover, according to several models, mindfulness works through values clarification (Shapiro et al., 2006) and meaning generation (Garland et al., 2010; Garland & Fredrickson, 2013; Garland, Farb, et al., 2015a, b; Garland, Geschwind, et al., 2015), resulting in enhanced self-regulation and motivation for values-driven behaviors (Shapiro et al., 2006; Vago & Silbersweig, 2012).

The field has produced a number of studies that provide empirical support for some of the beneficial effects of mindfulness on body image, eating, and self-care behaviors. For example, there is substantial evidence that mindfulness is positively associated with a more flexible, accepting, compassionate, and adaptive response to aversive body-related thoughts and feelings (Sandoz, Wilson, Merwin, & Kellum, 2013; Stewart, 2004), body satisfaction (Dekeyser, Raes, Leijssen,

Leysen, & Dewulf, 2008; Dijkstra, & Barelds, 2011; Lavender, Gratz, & Anderson, 2012), sexual body esteem (Fink, Foran, Sweeney, & O'Hea, 2009), and enhanced ability to sense and respect the body by engaging in adaptive behaviors to be able to attend to its needs (Cook-Cottone, 2006; Greeson et al., 2014; Webb, Wood-Barcalow, & Tylka, 2015). Moreover, recent studies suggested that higher levels of dispositional mindfulness were associated with higher reported choicefulness in day-to-day life (Brown & Ryan, 2003), improved self-care and life style behaviors (Slonim, Kienhuis, Di Benedetto, & Reece, 2015), such as sleep (Murphy, Mermelstein, Edwards, & Gidycz, 2012), and healthy dietary practices (Beshara, Hutchinson, & Wilson, 2013; Pidgeon, Lacota, & Champion, 2013; Jordan, Wang, Donatoni, & Meier, 2014).

Studies examining the relationship of unidimensional dispositional mindfulness and disordered eating indicated that higher levels of dispositional mindfulness among college students were associated with lower symptoms of eating pathology in general (Lavender, Jardin, & Anderson, 2009; Masuda, Price, & Latzman, 2012; Murphy et al., 2012), and less episodes of emotional and uncontrolled eating, unhealthy eating behaviors guided by emotional and external cues (Lattimore, Fisher, Malinowski, 2011; Pidgeon et al., 2013; Tak et al., 2015). However, the role of five distinct mindfulness facets (Baer et al., 2006) in disordered eating behaviors in various populations including college students is not as clear. Evidence from a number of correlational studies suggests that while some mindfulness facets may be uniquely related to lower rates of disorder eating behaviors, other facets either may not contribute to disordered eating at all, or contribute to higher rates of disordered eating (Adams et al., 2012; Lattimore et al., 2011; Lavender, Gratz, & Tull, 2011; Levin, Dalrymple, Himes, & Zimmerman, 2014). For example, several hierarchical regression analyses conducted on samples of college students demonstrated that the *acting with awareness* facet predicted lower symptoms of eating pathology including attitudes and behaviors associated with anorexia and bulimia nervosa (Adams et al., 2012; Lavender et al., 2011; Prowse, Bore, & Dyer, 2013). Results of hierarchical regression analyses conducted with individuals with diabetes indicated that the *acting*

with awareness facet predicted lower incidents external and emotional eating behaviors (Tak et al., 2015), but did not contribute to restrained eating behaviors. Similarly, although data from several studies suggested that the *non-reacting* mindfulness facet contributed to lower rates of eating pathology (Lavender et al., 2011) and emotional eating behaviors (Tak et al., 2015), other studies showed that the *non-reacting* mindfulness facet either contributed to higher rates of disordered eating behaviors such as restrained eating (Tak et al., 2015) or did not contribute for symptoms of eating pathology (Adams et al., 2012) and external eating (Tak et al., 2015). Past research on the relationship of the *describing* mindfulness facet and eating behaviors has resulted in similar inconsistent findings. For example, although studies revealed that the *describing* facet significantly contributed to lower symptoms of eating pathology (Adams et al., 2012) and lower rates of external and emotional eating behaviors (Tak et al., 2015), according to other findings, this facet either did not significantly account for variance in eating pathology (Prowse et al., 2013) and restrained eating behaviors (Tak et al., 2015), or contributed to more symptoms of eating pathology (Lavender et al., 2011). With regard to the *non-judging* facet, most of hierarchical regression studies demonstrated that the *non-judging* mindfulness facet predicted lower symptoms of eating pathology (Adams et al., 2012; Lavender et al., 2011; Prowse et al., 2013) and lower rates of restrained, external, and emotional eating (Tak et al., 2015). As to the *observing* mindfulness facet, hierarchical regression analyses revealed that the *observing* facet was either completely unrelated to symptoms of disordered eating (Lavender et al., 2011) including external, emotional, uncontrolled, and restraint eating behaviors (Lattimore et al., 2011; Tak et al., 2015), or predicted more symptoms of eating pathology (Adams et al., 2012; Prowse et al., 2013) and higher rates of restrained eating behaviors (Tak et al., 2015).

Although multiple studies have examined the contribution of unidimensional and multifaceted dispositional mindfulness to maladaptive and disordered eating behaviors (e.g., Adams et al., 2012; Lavender et al., 2009; Ouwens, Schiffer, Visser, Raeijmaekers, & Nyklíček, 2015; Prowse et al., 2013; Tak et al., 2015), research connecting mindfulness and intuitive eating is scarce.

Until today, only a few studies have examined the relationship between mindfulness and intuitive eating (e.g., Boucher et al., 2016; Bush, Rossy, Mintz, & Schopp, 2014; Sairanen et al., 2015). For example, studying the contribution of mindfulness facets measured by the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) to three separate intuitive eating factors (IES; Tylka, 2006), Sairanen and colleagues (2015) found that with the exception of the observing facet, four facets of mindfulness uniquely accounted for the variance in intuitive eating factors (IES) over and above psychological flexibility. Schoenefeld and Webb (2013), who focused on the relationship between self-compassion, a construct closely related to mindfulness, and intuitive eating measured by Intuitive Eating Scale (IES; Tylka, 2006), revealed that dispositional self-compassionate orientation facilitated greater engagement in intuitive eating among college women by fostering their acceptance of internal unpleasant experiences. Examining the efficacy of a workplace wellness intervention for problematic eating behaviors and body dissatisfaction combining intuitive eating and mindfulness training, Bush and colleagues (2014) revealed that dispositional mindfulness served as a partial mediator of change in intuitive eating behaviors of female university employees. In addition, results of this study suggested that mindfulness interventions might be particularly well suited for integration with intuitive eating interventions, because eating intuitively can feel impossible without learning how to pay attention and respond to hunger and satiety cues, and how to filter and cope with negative and unwanted cognitive, emotional, and environmental cues (Kristeller & Wolever, 2011; Wolever & Best, 2009). Indeed, accumulating research evidence indicates that mindfulness based interventions facilitate healthier eating behaviors (Baer, Fischer, & Huss, 2005; Caldwell, Baime, & Wolever, 2012) by diminishing emotional eating, binge eating, and external eating behaviors (Alberts, Thewissen, & Raes, 2012; Godfrey, Gallo, & Afari, 2015; Katterman, Kleinman, Hood, Nackers, & Corsica, 2014; O'Reilly, Cook, Spruijt-Metz, & Black, 2014), particularly if these interventions include mindful eating training (Albers, 2011; Kristeller, 2007; Kristeller, Woelver, & Sheets, 2013). Taken together, these results provide strong evidence that both dispositional and multidimensional mindfulness may facilitate intuitive eating.

Adaptive and Maladaptive Emotion Regulation Strategies

Similar to dispositional mindfulness, the ability to regulate emotions in an adaptive and effective way is a *second* "transdiagnostic" process that may be important for healthy intuitive eating behaviors as much as the lack of this ability has been associated with various psychological disorders disordered eating behaviors (Aldao, 2012, 2013; Aldao & Nolen-Hoeksema, 2010; Aldao, Nolen-Hoeksema, & Schweizer; Fairburn, Cooper & Shafran, 2003; Svaldi, Griepenstroh, Tuschen-Caffier, & Ehring, 2012). *Emotion regulation* may be defined as a "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998b, p. 275). Research findings have suggested that in response to environmental demands individuals use various emotion regulation strategies differently (Aldao, 2012, 2013; Aldao & Nolen-Hoeksema, 2010, 2012a; Gross, 1998a, b; Gross & Thompson, 2007; Kring & Sloan, 2009). According to recent conceptual models of emotion regulation, individuals usually have a repertoire of emotion regulation strategies that they use to modify their emotions and/or the situations eliciting these emotions (Gross, 1998a; Koole, 2009; Parkinson & Totterdell, 1999). For example, they may use easily unnoticed by others covert emotion regulation strategies (e.g., cognitive reappraisal or rumination), and in some situations, they may regulate their emotions engaging in certain overt behavioral strategies (e.g., behavioral avoidance or distraction) (Aldao & Dixon-Gordon, 2014; Gross, 1998a,b; Koole, 2009; Parkinson & Totterdell, 1999). Based on the ability of emotion regulation strategies to encourage behaviors that would either promote health and wellness or increase risk for mental and physical illness (Aldao et al., 2010; Ford & Mauss, 2014; Tugade, & Fredrickson, 2007), *emotion regulation strategies* have been putatively categorized into *adaptive* (e.g., cognitive reappraisal, problem solving, and acceptance) or *maladaptive* (e.g., self-criticism, rumination, mental distraction, thought suppression, expressive suppression, and behavioral avoidance or distraction) (Aldao et al., 2010; Aldao & Dixon-Gordon, 2014; Aldao & Nolen-Hoeksema, 2010, 2012a; Gross & John, 2003; John & Gross, 2004). Importantly, adaptive emotion

regulation strategies are skills that may be trained through training interventions or psychotherapy (Berking, 2010; Berking et al., 2008; Blackledge & Hayes, 2001; Linehan, 1993a, b; Linehan, 2015a, b; Mennin, 2006; Mennin & Fresco, 2013).

There are many reasons why habitual use of adaptive and maladaptive emotion regulation strategies may be relevant for healthy eating behaviors of young adult college women. First, a considerable amount of theoretical literature has been published on the relationship between emotion regulation and eating behaviors. For example, mindfulness theories suggest that emotion regulation and use of adaptive emotion regulation strategies (i.e., positive reappraisal) are linked to improved body awareness and positive body related cognitions (Garland, Farb, et al., 2015a, b; Holzel et al., 2011; Vago and Silbersweig, 2012). According to the empirically supported theory of emotions (Lange & James, 1967) highlighting the association between emotional experiences and interoceptive awareness (Damasio, Tranel, & Damasio, 1991; Pollatos, Schandry, Auer, & Kaufmann, 2007; Craig, 2002; Zaki, Davis, & Ochsner, 2012), people higher on interoceptive awareness and accuracy may have better emotion regulation (Farb et al., 2015; Füstös, Gramann, Herbert, & Pollatos, 2013). Furthermore, according to the process model of emotion regulation (Gross, 1998a; Gross, 2015b) and the affect regulation models of disordered eating (Anestis et al., 2007; Heatherton & Baumeister, 1991; Herman & Polivy, 1988), disinhibited eating functions as emotion-regulation strategy in its own right (e.g., Macht, 2008; Macht, Haupt, & Ellgring, 2004; Polivy & Herman, 2002; Cowdrey & Park, 2012). Thus, individuals regulating their emotions by eating may be less likely to use adaptive emotion-regulation strategies, because emotional and disinhibited eating fill the individuals' emotion-regulation needs (Aldao & Dixon-Gordon, 2014; Aldao et al., 2010). Conversely, healthy individuals would not engage in maladaptive eating behaviors (i.e., emotional, disinhibited, and restrictive eating, Evers et al., 2010) in an attempt to escape or distract themselves from negative emotions, but would respond to these emotions with greater adaptive (e.g., positive reappraisal) and fewer maladaptive (e.g., suppression) emotion regulation strategies.

Recent research studies supported these theories suggesting that college students tend engage in disordered eating cognitions and restrictive or disordered dieting patterns to compensate for their inability to adaptively regulate emotions (Ambwani, Slane, Thomas, Hopwood, & Grilo, 2014; Whiteside et al., 2007) and to distract themselves from consequences of stress (Sulkowski et al., 2011; Wolff et al., 2000). According to several studies, difficulties with emotion regulation account for significant variance in disordered eating behaviors over and above body mass index (BMI), negative affect, food restriction, and body image disturbances (Ambwani et al., 2014; Whiteside et al., 2007). It was established that for healthy college women emotion regulation difficulties and use of maladaptive emotion regulation strategies (e.g., suppression) resulted in excessive dieting, bulimic, or binge eating behaviors (Evers et al., 2010; Lafrance Robinson, Kosmerly, Mansfield-Green, & Lafrance, 2014), while use of adaptive emotion regulation strategies failed to show this association (Evers et al., 2010). Finally, evidence suggested that compared to individuals with eating disorders, healthy individuals experienced lower levels of emotion regulation difficulties (Brockmeyer et al., 2014; Harrison, Sullivan, Tchanturia, & Treasure, 2009) and had greater tendency to use adaptive emotion regulation strategies compared to maladaptive emotion regulation strategies (Svaldi, Griepenstroh, et al., 2012).

Although the role of emotion regulation in disordered eating behaviors has received considerable attention in research (Aldao et al., 2010; Svaldi, Griepenstroh, et al., 2012), there is a relatively small body of literature that is concerned with the role of emotional functioning in intuitive eating (for review, see Bruce & Ricciardelli, 2016). For example, researchers have found that individuals who eat more intuitively report lower levels of negative affect and higher levels of positive affect (Tylka et al., 2015; Tylka & Kroon Van Diest, 2013), higher awareness and acceptance of emotions (Shouse & Nilsson, 2011), higher distress tolerance (Schoenefeld & Webb, 2013), higher use of proactive coping and social problem solving skills (Tylka, 2006; Tylka & Wilcox, 2006), and lower levels of self-silencing (Shouse & Nilsson, 2011). To date, no research has been found that

examined the contribution of adaptive and maladaptive emotion regulation strategies to intuitive eating. Thus, determining the extent to which habitual use of adaptive and maladaptive emotion regulation strategies explain intuitive eating in college women is, therefore, of interest.

Body Appreciation

Accruing evidence indicates that in addition to the way young women attend to life situations, interpret them, and react to emotions stirred by them either using mindfulness and adaptive emotion regulation strategies to cope or being mindless and maladaptive in their emotion regulation choices (Aldao et al., 2010; Baer et al., 2006; Lavender et al., 2011; Li et al., 2015), the way they perceive their bodies and react to their body signals plays an influential role in their eating behaviors (Augustus-Horvath & Tylka, 2011; Tylka, 2006; Cash & Deagle, 1997; Pruzinsky & Cash, 2002). *Body image* has been theorized as a complex multidimensional construct with both positive and negative dimensions encompassing many aspects of how people experience their bodies, especially their physical appearance (Cash, 2004, 2012; Cash & Pruzinsky, 2002; Hrabosky et al., 2009; Muth & Cash, 1997). Although historically researchers tended to deconstruct body image by mainly focusing on its negative aspects and associated outcomes (Stice, 2002a; Stice, Marti, & Durant, 2011; Tylka, 2004; Tylka, & Subich, 2004), only recently the study of positive body image and its role in eating behaviors has gained considerable interest (Avalos et al., 2005, Halliwell, 2015; Piran, 2015; Tylka, 2004; Tylka & Wood-Barcalow, 2015b, c; Wood-Barcalow, Tylka, & Augustus-Horvath, 2010).

Positive body image is as a complex, stable, malleable, and multifaceted construct different from being just the opposite of negative body image and being more than body satisfaction or appearance evaluation (Tylka & Wood-Barcalow, 2015b, c; Webb et al., 2015). It can broadly be defined as a holistic state of body-self integration, that plays an important role in how individuals relate to the self and feel "at one" with their bodies (Menzel & Levine, 2011) experiencing embodiment (Halliwell, 2015; Piran & Teall, 2012; Tiggemann, 2015; Tylka & Wood-Barcalow,

2015b; Wood-Barcalow et al., 2010). Positive body image may be described as a third "transtherapeutic" process (e.g., Desrosiers et al., 2013; Greeson et al., 2014) that may promote healthy intuitive eating behaviors in college women. Although positive body image contains multiple facets including body appreciation, inner positivity, body acceptance and love, adaptive appearance investment, broad conceptualization of beauty, body functionality, attunement, body image flexibility, and ability to filter information in a body-protective manner (Avalos et al., 2005; Avalos & Tylka, 2006; Cook-Cottone, 2006, 2015; Sandoz et al., 2013; Tylka, 2011; Tylka & Iannantuono, 2016; Tylka & Wood-Barcalow, 2015b; Wood-Barcalow et al., 2010), the most comprehensive and well researched facet of positive body image is *body appreciation* (Tylka, 2011, 2013; Tylka & Wood-Barcalow, 2015b). *Body appreciation* has been conceptualized as a healthy way of relating to one's self while holding positive evaluations of one's body, accepting one's body despite its perceived imperfections, respecting one's body, attending to one's bodily needs through healthy nutrition and exercise, and protecting one's body from media-promoted unrealistic appearance ideals (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015b). For more than 10 years, researchers have been using the Body Appreciation Scale (BAS, Avalos et al., 2005; BAS-2, Tylka & Wood-Barcalow, 2015b) to examine unique features, correlates, and potential outcomes of positive body image.

The academic literature has revealed that body appreciation is negatively related to maladaptive characteristics such as negative affect, maladaptive perfectionism, and neuroticism (Avalos et al., 2005; Iannantuono & Tylka, 2012; Swami, Stieger, et al., 2012; Tylka & Kroon Van Diest, 2013), and positively related to a broad range of other positive well-being indices including positive affect, happiness, optimism, and self-esteem (Avalos et al., 2005; Dalley & Vidal, 2013; Tylka, & Wood-Barcalow, 2015b), adaptive coping (Avalos et al., 2005; Lobera & Ríos, 2011; Tylka, & Wood-Barcalow, 2015b), emotional intelligence (Swami, Begum, & Petrides, 2010), and subjective happiness (Swami, Tran, Stieger, & Voracek, 2015). Moreover, numerous studies have demonstrated that body appreciation is negatively related to disordered eating cognitions and

emotions (e.g., body dissatisfaction, body shame, and body image avoidance), and health-compromising disordered eating behaviors (e.g., symptoms of eating disorders, weight-loss behaviors, and disordered eating behaviors such as body checking) (Avalos et al., 2005; Iannantuono & Tylka, 2012; Tylka, 2013; Tylka & Kroon Van Diest, 2013; Tylka & Wood-Barcalow, 2015b).

Importantly, conceptually and empirically, body appreciation is more than the opposite of negative body image, as it holds components extending beyond being positive appearance evaluation and body satisfaction (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015b). For example, research findings suggest that individuals high on body appreciation are more protected against "threats or challenges to body-image experiences" (Cash, Santos, & Williams, 2005, p. 191) associated with sociocultural messages regarding unattainable standards of appearance, family criticism, lack of acceptance, and high peer competition that provokes body related negative emotions and body comparisons (Andrew et al., 2015b; Avalos et al., 2005; Halliwell, 2013; Wood-Barcalow et al., 2010). By filtering the societal messages about ideal appearance and keeping favorable evaluations of their bodies (Swami, Hadji-Michael, et al., 2008), women with high body appreciation are able to resist self-objectification (Andrew et al., 2015a; Tylka, 2011; Tylka & Wood-Barcalow, 2015b; Wood-Barcalow et al., 2010). Moreover, recent research studies have found that individuals high on body appreciation have higher levels of self-compassion (Homan & Tylka, 2015; Kelly & Stephen, 2016), practice more health-promoting behaviors (Andrew et al., 2016b), experience better sexual functioning, and engage in protective sexual health behaviors (Winter & Satinsky, 2014). Finally, according to research testing the acceptance model of intuitive eating (Andrew et al., 2015b; Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh et al., 2012), body appreciation is the stronger predictor of intuitive eating, its behavioral manifestation (Tylka & Homan, 2015).

Although body appreciation is one of the most statistically strong contributing intrapersonal factors explaining intuitive eating (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Oh et al., 2012; Tylka & Kroon Van Diest, 2013), there may be other

important psychological processes which may play the role of significant contributors to intuitive eating (Cook-Cottone, 2015; Oh et al., 2012; Piran, 2015). Given that conceptually intuitive eating behaviors belong to the eating behaviors continuum (e.g., Mintz & Betz, 1988; Tylka & Subich, 1999, 2004), processes underlying disordered eating behaviors such as dispositional mindfulness and habitual use of adaptive and maladaptive emotion regulation strategies may play a similarly important role in adaptive intuitive eating behaviors. Thus, along with the contribution of body appreciation to intuitive eating, research examining relative contribution of dispositional mindfulness and habitual use of adaptive and maladaptive emotion regulation strategies to intuitive eating is deemed warranted.

Theoretical Framework

Given recent advances in psychological science, neuroscience, and mindfulness research suggesting that complex cognitive, emotional, and behavior regulation processes underlie eating behaviors (Cook-Cottone, 2016; Masuda et al., 2012; Meule & Vögele, 2013), the framework used to explain these processes has been derived from previously discussed mindfulness theories (Garland, Farb, et al., 2015a,b; Greeson et al., 2014; Hart et al., 2013; Hölzel et al., 2011; Malinowski, 2008; Shapiro et al., 2006; Vago & Silbersweig, 2012), theory of emotion (Lange & James, 1967), emotion regulation theories (Gross, 1998a, b; Gross & Thompson, 2007), the affect regulation models of disordered eating (Anestis et al., 2007; Heatherton & Baumeister, 1991; Herman & Polivy, 1988; Macht et al., 2004; Polivy & Herman, 2002; Stice, Shaw, & Nemeroff, 1998), and the intuitive eating theory (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). Finally, a systems view is essential to conceptualize how multiple psychological processes may be continuously and mutually influential in the context of intuitive eating behaviors (Barrett, 2009; Barrett & Bar, 2009; Gottlieb, Wahlsten, & Lickliter, 2006; Hölzel et al., 2011; Izard, 2007; Thompson, 2011).

Purpose of the Study

The purpose of this quantitative study was to examine the relationships of dispositional

mindfulness, habitual use of adaptive and maladaptive emotion regulation strategies, and body appreciation to intuitive eating behaviors in a sample of university-recruited female emerging adults. Precisely, the present study examined the relative and unique contributions of dispositional mindfulness, adaptive and maladaptive emotion regulation strategies, and body appreciation in predicting intuitive eating. Moreover, the study was designed to test how several theoretical approaches including theories of intuitive eating, mindfulness, emotion, and emotion regulation, affect regulation model of disordered eating, and systems view, could potentially explain contributions of dispositional mindfulness, adaptive and maladaptive emotion regulation strategies, and body appreciation to intuitive eating behaviors (e.g., Anestis et al., 2007; Avalos & Tylka, 2006; Barrett, 2009; Cash, 2011; Garland, Farb, et al., 2015a,b; Gottlieb et al., 2006; Gross, 1998a, b; Heatherton & Baumeister, 1991; Herman & Polivy, 1988; Hölzel et al., 2011; Lange & James, 1967; Thompson, 2011; Vago & Silbersweig, 2012). Following advice of Avalos and Tylka (2006), contribution of dispositional mindfulness, adaptive and maladaptive emotion regulation strategies, and body appreciation to intuitive eating was examined after controlling for the effect of body mass index (BMI), a covariate of intuitive eating across numerous cross-sectional studies (Augustus-Horvath & Tylka, 2011; Oh et al., 2012; Tylka, 2006; Tylka & Kroon Van Diest, 2013).

The following research objectives indicate in more detail the specific research topics this study investigated. Specifically, the first objective of the present study was to assess shared and unique contributions of dispositional mindfulness, habitual use of adaptive and maladaptive emotion regulation strategies, and body appreciation to intuitive eating over and above body mass index. The role of all these predictors in eating behaviors was established in previous research (Avalos & Tylka, 2006; Evers et al., 2010; Lavender et al., 2009; Oh et al., 2012; Sairanen et al., 2015; Svaldi, Griepenstroh, et al., 2012). The second objective of this study was to examine unique and shared contribution of five mindfulness facets (FFMQ *observing, describing, non-judging, non-reactivity, and acting with awareness*) to intuitive eating, previously studied in the context of disordered eating

behaviors (Prowse et al., 2013; Tak et al., 2015). The third objective of the study was to examine the extent to which unidimensional dispositional mindfulness contributes to intuitive eating over and above the contribution of (a) body appreciation or (b) adaptive and maladaptive emotion regulation strategies (two total scores), while controlling for body mass index. The contribution of unidimensional mindfulness to eating behaviors was established in previous research (e.g., Lavender et al., 2009; Masuda et al., 2012). The fourth objective of the study was to examine the extent to which adaptive and maladaptive emotion regulation strategies (two total scores) may contribute to intuitive eating over and above the contribution of (a) unidimensional dispositional mindfulness or (b) body appreciation, while controlling for body mass index (BMI). The role of adaptive and maladaptive emotion regulation strategies in eating behaviors was confirmed empirically (Aldao et al., 2010; Brockmeyer et al., 2014; Svaldi et al., 2012). The fifth objective of the study was to examine the contribution of body appreciation over and above the contribution of (a) dispositional mindfulness or (b) adaptive and maladaptive emotion regulation strategies (two total scores), while controlling for body mass index (BMI). Predictive capacity of body appreciation (BAS) in intuitive eating was previously confirmed in research literature (e.g., Andrew et al., 2015b; Avalos et al., 2005; Iannantuono & Tylka, 2012; Tylka & Kroon Van Diest, 2013). Finally, the sixth objective of this study was to test the conceptual theoretically driven model of intuitive eating. The proposed hierarchical model suggested that there are five components contributing to intuitive eating: (a) body appreciation, (b) unidimensional mindfulness (also viewed as a multidimensional construct), and general use of (c) adaptive and (d) maladaptive emotion regulation strategies. According to this hierarchical regression model of intuitive eating, body appreciation is the most significant factor for predicting intuitive eating taking the most proximal position in the hierarchy (e.g., Augustus-Horvath & Tylka, 2011; Avalos et al., 2005). Three other potential contributors to intuitive eating including dispositional mindfulness, adaptive emotion regulation strategies (total score), and maladaptive emotion regulation strategies (total score), were placed in an order that reflected theoretically driven causal priority and empirical rationale (Cohen & Cohen, 1983; Tabachnick & Fidell, 2013).

Specifically, dispositional mindfulness was the second most important contributor to intuitive eating (Sairanen et al., 2015) after body appreciation. Dispositional mindfulness proceeded adaptive emotion regulation strategies as a more superior metacognitive trait (Garland, Farb, et al, 2015a, b). In contrast to clinical research findings focused on psychopathology (Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2010), adaptive emotion regulation strategies proceeded maladaptive emotion regulation strategies as a stronger predictor of healthy eating behaviors. Maladaptive emotion regulation strategies took the most distal place in this hierarchy.

Research Questions and Hypotheses

In line with the purposes of the study, the following research questions and hypotheses were proposed:

Research Question 1

To what extent dispositional *mindfulness* (FFMQ), *adaptive* and *maladaptive emotion regulation strategies* (two total scores), and *body appreciation* (BAS) will contribute to *intuitive eating* (IES-2), while controlling for *body mass index* (BMI)?

Hypothesis 1. Entered together as a set, total scores of unidimensional dispositional mindfulness (FFMQ), *adaptive* and *maladaptive emotion regulation strategies* (two total scores), and *body appreciation* (BAS) will uniquely and jointly account for significant amount of variance in *intuitive eating* (IES-2), over and above the variance accounted for by *body mass index* (BMI). The unique association between *intuitive eating* (IES-2) and *mindfulness* (FFMQ), *adaptive emotion regulation strategies*, and *body appreciation* (BAS) will be positive, and the association between *intuitive eating* (IES-2) and *maladaptive emotion regulation strategies* will be negative.

Research Question 2

To what extent five dispositional *mindfulness (FFMQ)* facets including *describing, non-judging, non-reactivity, acting with awareness,* and *observing*, will contribute to *intuitive eating* (IES-2), while controlling for *body mass index* (BMI)?

Hypothesis 2. The *describing, non-judging, non-reactivity, acting with awareness,* and *observing* mindfulness facets will account for a significant amount of unique and shared variance in *intuitive eating* (IES-2), while controlling for *body mass index* (BMI).

Research Question 3

To what extent unidimensional dispositional *mindfulness* (FFMQ) will contribute to *intuitive eating* (IES-2) over and above the contribution of (a) *body appreciation* (BAS) or (b) *adaptive* and *maladaptive emotion regulation strategies* (two total scores), while controlling for *body mass index* (BMI)?

Hypothesis 3a. Unidimensional dispositional *mindfulness* (FFMQ) will account for a significant amount of unique variance in *intuitive eating* (IES-2) over and above the variance accounted for by *body appreciation* (BAS), while controlling for *body mass index* (BMI).

Hypothesis 3b. Unidimensional dispositional *mindfulness* (FFMQ) will account for a significant amount of unique variance in *intuitive eating* (IES-2) over and above the variance accounted for by *adaptive* and *maladaptive emotion regulation strategies* (two total scores), while controlling for *body mass index* (BMI).

Research Question 4

To what extent unidimensional *adaptive* and *maladaptive emotion regulation strategies* (two total scores) will contribute to *intuitive eating* (IES-2) over and above the contribution of (a)

unidimensional dispositional *mindfulness* (FFMQ) or (b) *body appreciation* (BAS), while controlling for *body mass index* (BMI)?

Hypothesis 4a. *Adaptive* and *maladaptive emotion regulation strategies* (two total scores) will account for shared and unique variance in *intuitive eating* (IES-2) over and above the variance accounted for by unidimensional dispositional *mindfulness* (FFMQ), while controlling for *body mass index* (BMI).

Hypothesis 4b. *Adaptive* and *maladaptive emotion regulation strategies* (two total scores) will account for shared and unique variance in *intuitive eating* (IES-2) over and above the variance accounted for by *body appreciation* (BAS), while controlling for *body mass index* (BMI).

Research Question 5

To what extent *body appreciation* (BAS) will contribute to *intuitive eating* (IES-2) over and above the contribution of (a) dispositional *mindfulness* (FFMQ) or (b) *adaptive* and *maladaptive emotion regulation strategies* (two total scores), while controlling for *body mass index* (BMI)?

Hypothesis 5a. *Body appreciation* (BAS) will account for a significant amount of unique variance in *intuitive eating* (IES-2) over and above the variance accounted for by unidimensional dispositional *mindfulness* (FFMQ), while controlling for *body mass index* (BMI).

Hypothesis 5b. *Body appreciation* (BAS) will account for a significant amount of unique variance in *intuitive eating* (IES-2) over and above the variance accounted for by *adaptive* and *maladaptive emotion regulation strategies*, while controlling for *body mass index* (BMI).

Research Question 6

To what extent *adaptive* and *maladaptive emotion regulation strategies* (two total scores), unidimensional dispositional *mindfulness* (FFMQ), and *body appreciation* (BAS) will explain

intuitive eating (IES-2), when the covariate *body mass index* (BMI) is held constant and all explanatory variables are placed in an order according to their theoretical and empirical importance?

Hypothesis 6. When entered to the regression model in steps, beginning from conceptually most distal and empirically least important contributors and ending with the most proximal and most important contributors, the addition of each variable, starting from *body mass index* (BMI) as a covariate, and followed by *maladaptive emotion regulation strategies* (total score), *adaptive emotion regulation strategies* (total score), unidimensional dispositional *mindfulness* (FFMQ), and *body appreciation* (BAS), will significantly improve the model in its ability to explain *intuitive eating* (IES-2) over and above variables entered to the model in previous steps. In the final model, *body appreciation* (BAS) and unidimensional dispositional *mindfulness* (FFMQ) will account for significant unique variance in intuitive eating (IES2).

Post Hoc Research Question 7

What is the role of the *non-judging* mindfulness (FFMQ) facet in the relationship between the *acting with awareness* mindfulness facet and intuitive eating (IES-2)?

Hypothesis 7a. When only four mindfulness (FFMQ) facets including *observing*, *describing*, *non-reactivity*, and *acting with awareness* will be entered to the regression model at the second step, the *acting with awareness* facet will account for a unique significant portion of variance in intuitive eating (IES-2), while controlling for body mass index (BMI).

Hypothesis 7b. Based on mindfulness theory and research, the *non-judging* mindfulness (FFMQ) facet will mediate the relationship between the *acting with awareness* (FFMQ) facet and *intuitive eating* (IES-2). The indirect effect of the *non-judging* mindfulness (FFMQ) facet on *intuitive eating* (IES-2) will be significant.

Post Hoc Research Question 8

What is the role of *body appreciation* (BAS) in the relationship between unidimensional dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2)?

Hypothesis 8. Unidimensional dispositional *mindfulness* (FFMQ) will exert its effect on intuitive eating (IES-2) through *body appreciation* (BAS), the mediator of the relationship between *mindfulness* (FFMQ) and *intuitive eating* (IES-2). The indirect effect of dispositional *mindfulness* (FFMQ) on intuitive eating (IES-2) will be significant.

Post Hoc Research Question 9

What is the role of *body appreciation* (BAS) in the relationship between *adaptive emotion regulation strategies* (total score) and *intuitive eating* (IES-2)?

Hypothesis 9. *Adaptive emotion regulation strategies* (total score) will exert its effect on *intuitive eating* (IES-2) through *body appreciation* (BAS), the mediator of the relationship between *adaptive emotion regulation strategies* and *intuitive eating* (IES-2). The indirect effect of *adaptive emotion regulation strategie*s on *intuitive eating* (IES-2) will be significant.

Post Hoc Research Question 10

What is the role of *body appreciation* (BAS) in the relationship between *maladaptive emotion regulation strategies* (total score) and *intuitive eating* (IES-2)?

Hypothesis 10. *Maladaptive emotion regulation strategies* (total score) will exert the effect on *intuitive eating* (IES-2) through *body appreciation* (BAS), the mediator of the relationship between *maladaptive emotion regulation strategies* and *intuitive eating* (IES-2). The indirect effect of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) will be significant.

CHAPTER II

METHOD

In this chapter, the complete description of the methods used in this study was provided to enable the reader to evaluate the appropriateness of the selected methods, to assess the reliability and the validity of the results, and to allow other investigators to replicate the study. Specifically, this chapter included descriptions of participants and procedures used in the study. First, the sampling method, characteristics of the target population, the setting, and the sample size, as well as specific characteristics of participants were outlined. Second, in order to address research questions and to test hypotheses, procedures used to gather data, steps taken to protect vulnerable subjects, research design, and plan for preliminary and primary data analyses were described. Information regarding the psychometric properties of instruments was also presented.

Participants

Non-probability sampling (i.e., convenience sampling) has been employed in the present study. The target population for this study was a non-clinical sample of female emerging adults, where emerging adulthood has been defined as a period of development lasting from 18 to 29 years old "conceptually, theoretically, and empirically" different from adolescence and adulthood (Arnett, 2000, p. 463). Participants were undergraduate and graduate female college students between the ages of 18 and 29 enrolled in courses at the College of Education of a large public state-funded Midwestern university. The age of emerging adulthood has been selected to

minimize potential variations in the study's outcomes based on age and to reflect the predicted age range based on previous studies on intuitive eating utilizing similar samples (e.g., Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). Research has confirmed that this target demographic has a heightened risk for experiencing body image disturbances and disordered eating behaviors (Berg, Frazier, & Sherr, 2009; Fitzsimmons-Craft, Harney, Koehler, Danzi, Riddell, & Bardone-Cone, 2012; Tylka & Subich, 2002). Also, it is easier to find and assess individuals who practice adaptive healthy eating behaviors among the nonclinical population of college students (Tylka & Kroon Van Diest, 2013).

Based on Nunnally's (1978) recommendation, which suggests sample size of at least 100 for $k < 3$ and a sample size of 300–400 for k as large as 9 or 10, where k is the number of predictors or independent variables, recruitment of not less than 350 participants has been needed for this study. An a priori power analysis (Cohen, 1988), an effective method of controlling statistical power before social, behavioural, and biomedical scientific studies (Cohen,1988; Faul, Erdfelder, Lang, & Buchner, 2007), has been conducted to determine the sample size for the current study using the statistical software program G*Power (version 3.1.9.2; Faul et al., 2007). According to the results of the G*Power analyses with eight predictor variables and one covariate (assumed values were $\alpha = 0.05$, power = 0.80, and a medium effect size of .15), the sample size of 114 participants was required for this study. The original data set included responses from 438 female undergraduate and graduate students. After the data cleaning procedures, described in the Preliminary Analysis part of the Results section, 394 participants remained in the study. This final sample size exceeded the sample size of 350 participants recommended by Nunnally's (1978) as well as the sample size of 114 participants derived from the G*Power analyses (Faul et al., 2007).

Demographics characteristics of 394 female participants are presented in Table 1. Participants ranged in age from 18 to 29 ($M = 21.09$, $SD = 2.07$). There were 268 women who were between 18 and 21 years of age (68%), 106 women who were between 22 and 25 years of age (26.9%), and 20

Table 1

*Demographics Characteristics of Participants (*N=*394)*

Characteristic	*n*	%
Age Range		
Ages 18-21	268	68.0
Ages 22-25	106	26.9
Ages 26-29	20	5.1
Ethnic Identification		
European American or White	302	76.6
American Indian or Alaska Native	26	6.6
African American or Black	24	6.1
Hispanic or Latina or Latino	17	4.3
Biracial or Multiracial	12	3.0
Asian American or Asian	10	2.5
Not listed	3	.8
Religion		
Protestant Christian	194	49.2
Catholic Christian	48	12.2
Spiritual but not religious	34	8.6
Agnostic	32	8.1
Orthodox Christian	18	4.6
Atheist	14	3.6
Other (Mormon/L.D.S, Jehovah's Witness, Hindu, Muslim)	5	1.4
Not listed	49	12.5
Academic Status		
Undergraduate student at a 4-year college	341	86.5
Master's level graduate student	47	11.9
Community college and Doctoral level graduate students	6	1.5
Employment Status		
Part-time Employed	215	54.6
Unemployed	138	35.0
Full-time Employed	41	10.4
Relationship Status		
Single and unattached	185	47.0
Single with a significant other	181	45.9
Married	28	7.1
Body Mass Index		
Healthy Weight	230	58.4
Overweight	83	21.1
Obese	62	15.7
Underweight	19	4.8

Note. Totals of percentages are not 100 for every characteristic because of rounding.

women who were between ages 26 to 29 years of age (5.1%). Most respondents identified as European American (*n*=302, 76.6%), with others identifying as American Indian (*n*=26, 6.6%), African American (*n*=24, 6.1%), Hispanic (*n*=17, 4.3%), Multiracial (*n*=12, 3.0%), and Asian American (*n*=10, 2.5%). A number of participants (*n*=3, 0.8%) did not report their ethnic identification. Answering the question about their religious or spiritual beliefs, approximately one-half of the sample identified as Protestant Christian (*n*=194; 49.2%), with others reporting being Catholic Christian (*n*=48, 12.2%), spiritual but not religious (*n*=34, 8.6%), Agnostic (*n*=32, 8.1%), Orthodox Christian (*n*=18, 4.6%), and Atheist (*n*=14, 3.6%). Participants who identified as Jehovah's Witness (*n*=2, 0.5%), Mormon/L.D.S (*n*=1, 0.3%), Hindu (*n*=1, 0.3%), and Muslim (*n*=1, 0.3%) were not numerous. There were participants who reported that their religion was not listed (*n*=49, 12.5%). Reporting their relationship status, almost half of women (*n*=185, 47%) were single and unattached, another big part of them were single, yet had a significant other (*n*=181, 45.9%), and a small proportion was married (*n*=28, 7.1%). In terms of academic status, the majority of respondents were undergraduate students at a 4-year college or University (*n*=341, 86.5%), followed by master's level graduate students (*n*=47, 11.9%), students at a community or technical college (*n*=4, 1 %), and doctoral level students (*n*=2, 0.5%). Regarding their employment status, nearly half of the participants identified as part-time employed (*n* = 215, 54.6%). Other respondents indicated that they were unemployed (*n* = 138, 35%) or full-time employed (*n*=41, 10.4%). Although individuals majoring in various academic disciplines were participating in this study, their major was not reported.

Women, on average, reported being 65.19 (*SD* = 3.54) inches tall and weighing 149.08 (*SD* = 31.97) pounds. This information was converted to metric units, and body mass index (BMI) score was calculated (kg/m^2, *M*= 24.72, *SD* =5.25). Information on body mass index (BMI) may be found in Table 2. The majority of women were in healthy weight (*n*=230, 58.4%) based on criteria from the Center for Disease Control (n.d.), in which a healthy adults' body mass index ranges between 18.5 and 24.9 (CDC, n.d.). Women's average body mass index (BMI) score was 24.72 (*SD* = 5.25), with

4.8% (n = 19) of the study participants who were underweight (BMI < 18.5), 58.4% (n = 230) who were in healthy weight (18.5 < BMI < 24.9), 21.1% (n =83) who were overweight (25 <BMI < 29.9), and 15.7% (n = 62) who were obese (BMI > 30). In the current sample, the participants' *body mass index* (BMI) (*M*= 24.72, *SD* =5.25), was within the normal range for healthy weight (18.5 < BMI < 24.9), however it was very close to the overweight *body mass index* (BMI) group category (25 <BMI < 29.9) outlined in the Center of Disease Control Guidelines (n.d.).

Procedures

Participants were recruited from the Sona student participant pool of the College of Education, an online software system used to conduct research, solicit participation, and award extra course credit as compensation for participants' time. Undergraduate and graduate students getting degrees in such areas as aviation and space, health & human performance, teaching, counseling, educational and counseling psychology, and educational leadership could sign up for participation in this research study. All procedures used in this study were approved by the University Institutional Review Board (IRB) before the data was collected. Participants of the study were treated in accordance with APA ethical guidelines for the conduct of research (See Appendix H: IRB approval). Participants were asked to sign an informed consent form prior to starting the study survey. They were informed that the purpose of the study was to investigate their tendency to be mindful and to pay attention in their everyday life, their emotion regulation skills, their body image, and eating behaviors, and were assured that their participation was anonymous and voluntary, and that they may withdraw from the study at any time without penalty. Participants received information regarding extra course credit as an alternative way to fulfilling their course requirement from their instructors. In the current study, participants received one extra credit for completing the survey. The study survey was hosted on Qualtrics, a secure, encrypted web-based survey and data collection tool. On average, it took approximately 30 minutes to complete the survey consisting of four questionnaires and a page with demographic questions at the end of the survey.

Instruments

Participants were asked to complete an online survey which included instruments to operationally measure the following constructs: (a) Intuitive Eating; (b) Dispositional Mindfulness (unidimensional and multidimensional/five facets); (c) Adaptive and Maladaptive Emotion Regulations Strategies (two unidimensional groups); (d) Body Appreciation; and (e) Body Mass Index. The survey also included a set of demographic questions. To capture random responses with little pattern or thought (Cronbach, 1950), three attention check questions were placed periodically throughout the survey. All measures may be found in appendices B-F.

Intuitive Eating

The Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013) is the second 23-item improved version of the original 21-item Intuitive Eating Scale (IES; Tylka, 2006) designed to measure individuals' tendency to follow their physical hunger and satiety cues when determining when, what, and how much to eat. The 23-item IES-2 include 11 of Tylka's (2006) original items and 12 newly developed items (Tylka & Kroon Van Diest, 2013). The IES-2 has four subscales reflecting four central components of intuitive eating, namely (a) *Eating for Physical Rather Than Emotional Reasons* (EPR) subscale (e.g., When I am bored, I do NOT eat just for something to do); (b) *Unconditional Permission to Eat* (UPE) subscale (e.g., I allow myself to eat what food I desire at the moment); (c) *Reliance on Hunger and Satiety Cues* (RHSC) subscale (e.g., I rely on my hunger signals to tell me when to eat); and (d) *Body–Food Choice Congruence* (B-FCC) subscale (e.g., I mostly eat foods that make my body perform efficiently). The IES-2 items are rated on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), subscale scores and the total scale scores summed and averaged, with higher scores indicating greater intuitive eating.

Research supported the psychometric properties of the IES-2 as well as the adaptive properties of intuitive eating with women. Specifically, the IES-2 demonstrated good internal

consistency among female university students (Tylka & Kroon Van Diest, 2013). According to criteria outlined by Nunnally (1978), Cronbach's alpha coefficients for the 23-item IES-2 total score (α=.87), the *Eating for Physical Rather Than Emotional Reasons* (EPR) subscale (α=.93), the *Unconditional Permission to Eat* (UPE) subscale (α=.81), the *Reliance on Hunger and Satiety Cues* (RHSC) subscale (α=.88), and the *Body–Food Choice Congruence* (B-FCC) subscale (α=.87) suggested good to excellent internal consistency. The IES-2 total score and subscale scores were stable across a 3-week period and had good construct validity with other instruments, showing positive correlations with interoceptive awareness, body appreciation, and psychological well-being, and negative correlations with eating disorder symptomatology, and negative and constrictive body attitudes (Tylka & Kroon Van Diest, 2013). In the current study IES-2 demonstrated good reliability (α = .85) with Cronbach's alpha coefficients ranging from acceptable to good for the *Eating for Physical Rather Than Emotional Reasons* (EPR) subscale (α=.89), the *Unconditional Permission to Eat* (UPE) subscale (α=.71), the *Reliance on Hunger and Satiety* Cues (RHSC) subscale (α=.87), and the *Body–Food Choice Congruence* (B-FCC) subscale (α=.89). Although four separate IES-2 subscale scores may be used in research, in this study the total IES-2 averaged score was used to measure participants' tendency to eat intuitively with higher IES-2 figures corresponding to higher levels of intuitive eating.

Dispositional Mindfulness

In the present study, dispositional mindfulness was measured by the *Five Facet Mindfulness Questionnaire* (FFMQ; Baer et al., 2006), one of the most widely used comprehensive self-report measures of mindfulness. The 39 item self-report FFMQ instrument was chosen because it allowed to measure five distinct dispositional mindfulness facets as well as unidimensional mindfulness. The FFMQ's (Baer et al., 2006) items are based on factor analyses of several recently developed mindfulness questionnaires, namely, the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001;

Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), the Cognitive and Affective Mindfulness Scale (CAMS; Feldman et al., 2007), and the Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005). The FFMQ consists of the following five subscales reflecting the five facets of mindfulness: (a) *non-reactivity to inner experiences*; (b) *observing;* (c) *acting with awareness*; (d) *non-judging of inner experiences*; and (e) *describing*. The *Non-reactivity to Inner Experiences* subscale (7-items) measures participants' tendency to allow thoughts and feelings to come and go, without getting caught up in or carried away by them (e.g., I watch my feelings without getting lost in them.). The *Observing* subscale (8-items) is consistent with a conceptualization of mindfulness as a form of reflective awareness and meta-cognitive processing of events because it measures participants' capacity for noticing or attending to internal and external stimuli (e.g., I pay attention to sensations, such as the wind in my hair or the sun in my face). The *Acting with Awareness* subscale (8-items) assesses ability to sustain focused attention on activities in the present moment, in contrast to operating on "autopilot" (e.g., I am easily distracted). The *Non-judging of Inner Experience* subscale (8-items) refers to taking a non-evaluative stance towards thoughts and feelings (e.g., I tell myself that I shouldn't be thinking the way I'm thinking). The *Describing* subscale (8-items) measures the ability to label observed phenomena with words (e.g., My natural tendency is to put my experiences into words). Each of the 39 items of the FFMQ is rated on a 5-point Likert-type scale, ranging from 1 (never or very rarely true) to 5 (very often or always true). Separate FFMQ subscale scores which range from 39 to 195 may be calculated by summing the responses to subscale items (some items were reverse coded). The total *mindfulness* (FFMQ) score ranging from 39 to 195 may be computed by summing five subscales scores. Higher scores on the FFMQ total scale and subscales correspond to higher levels of dispositional mindfulness.

Previous research has established that individual FFMQ *mindfulness* facets have good psychometric properties within samples of college students (Baer et al., 2006; Baer et al., 2008).

Specifically, recent studies (e.g., Baer et al., 2006; Baer et al., 2008) have shown that FFMQ mindfulness facets have good internal consistency (Cronbach alpha), demonstrating significant relationships in the predicted directions with numerous mindfulness related constructs and significant correlations with the original mindfulness instruments (MAAS, FMI, KIMS, CAMS, MQ). Regression, mediation, and confirmatory factor analyses have supported the validity of the FFMQ (Baer et al., 2006; Baer et al., 2008). Moreover, studies have shown increases in FFMQ *mindfulness* facets scores with participation in MBSR (Carmody & Baer, 2008) and significant correlations with the extent of mindfulness meditation experience (Lykins & Baer, 2009). In the original study conducted by Baer and colleagues (2006), Cronbach alphas for the *Non-reactivity* subscale ($\alpha = .75$), the *Observing* subscale ($\alpha = .83$), the *Acting with Awareness* subscale ($\alpha = .87$), the *Non-judging of Inner Experiences* subscale ($\alpha = .87$), and the *Describing* subscale ($\alpha = .91$) were ranging from adequate to excellent.

Although evidence suggests that the FFMQ total score may not be psychometrically sound (e.g., Baer et al., 2006; Baer et al., 2008), researchers who have been examining the associations between mindfulness and eating behaviors have been using both the FFMQ total score and individual facets scores (e.g., Beshara et al, 2013; Cowdrey & Park, 2012; Lattimore et al., 2011; Tak et al., 2015). For example, in a study conducted with a sample of women college students the single factor *Mindfulness* (FFMQ) scale has shown good internal consistency ($\alpha = .88$) (Lattimore et al., 2011). In the current study, a 39-item total *mindfulness* (FFMQ) score was computed by summing the scores on the individual items. Summed scores for each of the five FFMQ *mindfulness* facets were also computed. Consistent with previous research (Baer et al., 2006), the single factor *Mindfulness* (FFMQ) scale ($\alpha = .88$) and five *Mindfulness* subscales have shown an adequate to good internal consistency: The *Non-reactivity* subscale ($\alpha = .73$), the *Observing* subscale ($\alpha = .76$), the *Acting with Awareness* subscale ($\alpha = .87$), the *Non-judging* subscale ($\alpha = .90$), and the *Describing* subscale ($\alpha = .89$).

Emotion Regulation Strategies

Recently**,** researchers have emphasized that studies on emotion regulation strategies incorporate simultaneous examination of various emotion regulation strategies (Aldao, 2013; Aldao & Dixon-Gordon, 2014; Aldao & Nolen-Hoeksema, 2010, 2012a, 2012b; Aldao et al., 2010; Koole, 2009; Parkinson & Totterdell, 1999). Two scales measuring emotion regulation strategies comprising items from previously established measures and newly created items were developed specifically for this study. These two scales represent two major categories of emotion regulation strategies: (a) putatively *adaptive emotion regulation strategies* (four subscales of four items each), and (b) putatively *maladaptive emotion regulation strategies* (two subscales of four items each and two subscales of six items each). Items in both scales were accompanied by instructions for participants from the *Coping Orientation to Problems Experienced Scale* (COPE; Carver, Scheier, & Weintraub, 1989) adapted for the purpose of this study. Participants responded to items on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always).

Putatively Adaptive Emotion Regulation Strategies. Putatively adaptive emotion regulation strategies were captured by a scale (16 items) consisting of four subscales: (1) *Cognitive Problems Solving*; (2) *Cognitive Positive Reappraisal*; (3) *Cognitive Acceptance of Emotions*; and (4) *Overt or Behavioral Problems Solving*. The items of the *Cognitive Problems Solving*, *Cognitive Positive Reappraisal*, and *Overt Behavioral Problems Solving* subscale were derived from the *COPE* Inventory (Carver et al., 1989), a 60-item multidimensional inventory that assesses 15 conceptually distinct behavioral and cognitive coping strategies, several of which are theory-driven (Carver et al., 1989).

In this study, the *Cognitive Problems Solving* subscale was based on the *Planning* subscale of the *COPE* (4 items) referring to making a problem solving plan of actions (e.g., I make a plan of action). The *Cognitive Positive Reappraisal* subscale was based on the *Positive Reinterpretation and*

Growth subscale (4 items) of the COPE, referring to reframing the situation and making the best of it by growing from it (e.g., I learn something from the experience). The overt *Behavioral Problems Solving* subscale was based on the *Active Coping* subscale (4 items) of the COPE referring to the process of problem solving and taking active steps to try to remove or circumvent the stressor or to ameliorate its effects (e.g., I take direct action to get around the problem). Despite some criticism towards its unstable factor structure and low alpha coefficients, the subscales of the *COPE* used in this study have been extensively used in emotion regulation research (e.g., Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012b; Nolen-Hoeksema & Aldao, 2011). In the study conducted by Carver and colleagues (1989), the Cronbach's alpha reliability coefficient for the *Planning* subscale (*Cognitive Problems Solving* subscale in this study) was $\alpha = .80$, for the *Positive Reinterpretation and Growth* subscale (*Cognitive Positive Reappraisal* in this study) it was $\alpha = .68$, and for the overt *Active Coping* subscale (*Behavioral Problems Solving* in this study) of the COPE it was $\alpha = .62$. In the present study, the Cronbach's alpha coefficients for the *Cognitive Problems Solving* subscale ($\alpha = .77$), the *Cognitive Positive Reappraisal* subscale ($\alpha = .81$), and the overt *Behavioral Problems Solving* subscale ($\alpha = .76$) were ranging from acceptable to good (Nunally, 1978).

The fourth subscale of the *Adaptive Emotion Regulation Strategies* scale measuring *acceptance of emotions* (4 items) strategy, combined items adapted from previously existing instruments specifically for this study. The *first two items* were derived from the Inventory of Cognitive Affect Regulation Strategies (ICARUS; Kamholz, Hayes, Carver, Gulliver, & Perlman, 2006), a 59 item self-report inventory which assesses fifteen different cognitive emotion regulation strategies. *ICARUS* has been previously used in research on the role of emotion regulation strategies in disordered eating (e.g., Svaldi, Griepenstroh, et al., 2012). Cronbach alphas of *ICARUS* subscales were found to be acceptable to excellent in non-clinical samples (Kamholz et al., 2006). Two items of the *Acceptance of Feelings* subscale of the *ICARUS* measuring the tendency to normalize, accept, and validate one's emotional responses to stress inducing situations were modified for the purpose of this

study (e.g., I think that it is natural to feel this way about what happened). The Cronbach alpha for this subscale of the *ICARUS* was relatively low, ranging from α = .51 to α = .74 in non-clinical samples (Kamholz et al., 2006), probably due to a low number of items (n =2) associated with the tendency of coefficient alpha to underestimates true reliability, especially in scales with only two items (Eisinga, Grotenhuis, & Pelzer, 2013; Emons, Sijtsma, & Meijer 2007). Furthermore, the *other two items* on the *Acceptance of Emotions* subscale were derived from the *Affective Style Questionnaire* (ASQ, Hofmann & Kashdan, 2010), a 20-item self-report inventory with good psychometric properties comprising items derived from previously existing scales (ERQ, Gross & John, 2003; AAQ, Hayes et al., 2004). Specifically, two items from the *Tolerating* subscale of the ASQ (α=.66) assessing a non-defensive, acceptant, and tolerant attitude toward emotional reactions were adapted for the purpose of this study (e.g., I think that there is nothing wrong with feeling very emotional after what happened). Thus, the *Acceptance of Emotions* subscale (4 items) used in this study, combined four items adapted from previously existing instruments. Cronbach's alpha coefficient for the *Acceptance of Emotions* subscale was acceptable (α=.73).

In the present study, individual subscales measuring four *adaptive emotion regulation strategies* were not included in research questions and hypotheses. Thus, only the total summed score (ranging from 16 to 80) of the scale measuring *Adaptive Emotion Regulation Strategies* reflecting individual differences in using adaptive emotion regulation strategies was used to test the hypotheses in this study. Cronbach's alpha coefficient for the *Adaptive Emotion Regulation Strategies* scale suggested good reliability (α = .89).

Putatively Maladaptive Emotion Regulation Strategies. In the current study putatively maladaptive emotion regulation strategies were measured by a scale (20 items) consisting of four subscales: (1) *Thought Suppression/Mental Distraction*; (2) *Expressive Suppression*; and (3) *Self-Critical Rumination*; and (4) *Behavioral Avoidance, Disengagement, and Distraction*.

First, the subscale measuring *thought suppression/mental distraction* (4 items) emotion regulation strategies contained items of the *Thought Suppression/Mental Distraction* subscale of the *Inventory of Cognitive Affect Regulation Strategies* (ICARUS; Kamholz et al., 2006), a 59 item self-report measure of fifteen different cognitive emotion regulation strategies. *ICARUS* has been previously used in research on the role of emotion regulation strategies in disordered eating (e.g., Svaldi, Griepenstroh, et al., 2012). The *Thought Suppression/Mental Distraction* subscale of the ICARUS assesses a cognitive emotion regulation strategy of active forgetting and temporary shifting away from disturbing thoughts related to the situation or feelings (e.g., I try to forget what is upsetting me). The original *Thought Suppression/Mental Distraction* subscale of the *ICARUS* demonstrated acceptable or good internal consistency in non-clinical samples with Cronbach's alpha coefficient ranging from α.78 to α = .83 (Kamholz et al., 2006). In the present study, Cronbach's alpha for the *Thought Suppression/Mental Distraction* subscale indicated adequate reliability (α=.71).

Second, items for the subscale measuring the emotion regulation strategy of *expressive suppression* (4 items) were based on work by Gross and John (1997; 2003), who distinguished a response-focused emotion regulation strategy of *expressive suppression* and presented the *Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003) measuring the habitual use of reappraisal and suppression of positive and negative emotions. Additionally, items for the *Expressive Suppression* subscale were derived from the *Affective Style Questionnaire* (ASQ; Hofmann & Kashdan, 2010), a self-report measure assessing three general strategies to handle emotional reactions including strategies intended to conceal or suppress affect. Both, the *Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003) and the *Affective Style Questionnaire* (ASQ; Hofmann & Kashdan, 2010) have shown good psychometric properties in college student samples. Specifically, the *Expressive Suppression* subscale (ERQ; Gross & John, 2003) used to assess the tendency to suppress expression of positive and negative emotions (e.g., I keep my emotions to myself or I control my emotions about the situation by not expressing them) demonstrated adequate internal consistency (α = .73). The ASQ

Concealing subscale (Hofmann & Kashdan, 2010) used to measure habitual attempts to conceal or suppress affect (e.g., I often suppress my emotional reactions to things or I am good at hiding my feelings) has shown good internal consistency (α = .84). For the use in the study, the above items were adapted to reflect a tendency to suppress negative emotions created by a recent stressful or upsetting situation (e.g., I keep my emotions about this situation to myself or I hide the way I feel about the situation). In the present study, Cronbach's alpha reliability for the *Expressive Suppression* subscale reflected good internal consistency (α = .82).

Third, items of the *Self-critical Rumination* subscale (6 items) were derived from the *Self-blame/Self-criticism* and the *Focus on Thought/Rumination* subscales of the *Cognitive Emotion Regulation Questionnaire* (CERQ; Garnefski, Kraaij, & Spinhoven, 2001). The subscales of the CERQ, a 36-item self-report measure of nine conceptually distinct cognitive emotion regulation strategies demonstrated good internal consistencies, with alphas ranging from 0.67 to 0.81 (Garnefski et al., 2001). Four items of the CERQ *Self-blame/Self-criticism* subscale referring to putting the blame for a negative experience on oneself (e.g., I feel that I am the one who is responsible for what has happened), and two items of the CERQ *Focus on Thought/Rumination* subscale referring to rumination on feelings and thoughts associated with the negative event (e.g., I am preoccupied with what I think and feel about what I have experienced; I think that, basically, the cause must lie within myself) were used in this study. Cronbach's alpha coefficient for the *Self-critical Rumination* subscale suggested good internal consistency (α = .83).

Fourth, the *Behavioral Avoidance/Disengagement/Distraction* subscale (6 items) comprised items measuring overt behavioral avoidance emotion regulation strategies. The subscale was developed on the basis of previous research (ER taxonomy; Gross, 1998; Parkinson & Totterdell, 1999; Aldao & Dixon-Gordon, 2014). For example, Aldao and Dixon-Gordon (2014), found that activities aimed to avoid taking any actions about the situation causing negative emotions such as seeking advice and watching TV, predicted symptoms of psychopathology over and above covert

emotion regulation strategies such as rumination and expressive suppression. In the present study, six distracting activities were measured including completely avoiding the situation, avoiding doing something about the situation, and specific activities such as surfing the Internet and engaging in social networking such as Facebook, sleeping, watching TV shows, and running errands or doing chores (e.g., I avoid doing something about this situation; I sleep to make myself feel better; I surf the Internet or engage in social networking such as Facebook to feel better). The Cronbach alpha coefficient for the *Behavioral Avoidance /Disengagement/ Distraction* subscale in the current study was adequate (α=.70).

Similar to the measure of *adaptive emotion regulation strategies* used in the study, only the total summed score (ranging from 20 to 100) of the *Maladaptive Emotion Regulation Strategies* scale reflecting individual differences in habitual use of *maladaptive emotion regulation strategies* was used to test the hypotheses in this study. Individual subscales measuring four *maladaptive emotion regulation strategies* were not included in research questions and hypotheses. Cronbach's alpha for the *Maladaptive Emotion Regulation Strategies* scale indicated good reliability (α=.88).

Body Appreciation

The *Body Appreciation Scale* (BAS; Avalos et al., 2005) is a 13-item self-report scale measuring the extent to which participants appreciate, accept, respect, and take care of their body regardless of its flaws and inconsistency with media ideals, and protect it against unrealistic media images (e.g., Despite its flaws, I accept my body for what it is; I respect my body). The BAS has a unidimensional structure when used among Western participants (Avalos et al., 2005; Swami, Stieger, Haubner, & Voracek, 2008; Tylka, 2013). The original version of the BAS was evaluated with women, and thus participants answered a gender-specific question (i.e., "I do not allow unrealistically thin images of women presented in the media to affect my attitudes toward my body"). Participants rated their level of agreement on a 5-point Likert-type scale (1 = never, 2 = seldom, 3 = sometimes, 4

= often, 5 = always), with higher scores reflecting greater body appreciation. Items of the BAS were summed and averaged, with higher scores indicating greater body appreciation. The BAS' psychometric properties gained solid support in research studies (Avalos et al., 2005; Tylka & Kroon Van Diest, 2013; Wasylkiw et al., 2012). For example, among college women, the BAS demonstrated internal consistency reliability (α= .94), stability over a 3-week period (r = .90), and construct validity via its inverse relationships to measures of body dissatisfaction and positive relationship to self-esteem (Avalos et al., 2005). In the present study, the Cronbach's alpha reliability for the BAS among women was excellent (α = .93).

Body Mass Index

Participants were asked to report their current weight and height, in imperial form. With weight and height information, a *body mass index* (BMI: 703 x [weight (lbs)/height (in)2]; CDC, 2015) score was produced using the above formula. According to the Center for Disease Control Guidelines (n.d.), the standard weight status categories associated with BMI ranges for adults are referred to as underweight (BMI below 18.5), normal or healthy weight (BMI from 18.5 to 24.9), overweight (BMI from 25.0 to 29.9), and obese (BMI of 30.0 and above). *Body mass index* (BMI) was used as a covariate in the analyses to control for the potential influence of actual physical size (e.g., overweight, obesity), because lower BMI has been related to higher intuitive eating scores across numerous cross-sectional studies (e.g., Augustus-Horvath & Tylka, 2011; Madden, Leong, Gray, & Horwath, 2012; Tylka, 2006; Tylka & Kroon Van Diest, 2013; Schoenefeld & Webb, 2013).

Demographic Survey

Female participants completed a demographic page with questions related to their age, ethnic identification, religion, academic status, employment status, and relationship status. Demographic questions were asked to inform the limits of generalizability of this study's findings, and to be able to accurately describe the population from which the results of the study were gleaned.

Attention Checks

Three attention checks or bogus red herring questions mimicking items on the questionnaire were used to improve data quality by capturing random and inattentive responses which add substantial error variance to analyses (Berinsky, Margolis & Sances, 2014; Meade & Craig, 2012; Osborne, 2012; Osborne & Blanchard, 2011; Oppenheimer, Meyvis, & Davidenko, 2009). For example, one attention check read: "Please show that you are reading all the items carefully, by checking the 1st box from the right, labeled Daily". It was expected that participants who were paying attention to each question would respond to attention checks in a particular way (Beach, 1989). Attention check questions were scored as correct or incorrect, and a total score combining three responses provided an overall pass or fail rating. Participants who answered two out of three attention checks correctly were considered passing.

Research Design

A non-experimental, quantitative correlational design (Creswell, 2002) and a cross-sectional survey methodology was used in the current study to examine the relationships and relative contributions of unidimensional mindfulness, mindfulness facets, adaptive and maladaptive emotion regulation strategies, and body appreciation to intuitive eating behaviors in a sample university-recruited female emerging adults.

Data Analysis Strategies

Preliminary analyses performed in this study, included procedures addressing erroneous and missing data, descriptive analysis of demographic information and study variables, reliability analysis, tests of assumptions, and Pearson correlation analysis. Primary analyses comprising hierarchical regression analyses were implemented to answer research questions and to test study hypotheses. Preliminary and primary analyses were performed using IBM SPSS, Version 22.0. (IBM

Corp., 2013). Additional post hoc mediation analyses were completed using the macro tool PROCESS designed for SPSS (Hayes, 2012, 2013; Hayes & Preacher, 2014).

Preliminary data analyses. Analyses were conducted in several steps. Following recommendations of Osborne (2012, 2013), prior to the primary data analysis, preliminary analyses of demographic and study variables were conducted. First, data was screened for erroneous and missing data, and complete and valid cases were identified (Meade & Craig, 2012; Osborne, 2012, 2013; Osborne & Blanchard, 2011). To eliminate missing values, Expectation Maximization (EM) imputation procedure was conducted (Graham, Cumsille, & Elek-Fisk, 2003). Further, univariate and multivariate outliers, and extreme cases were identified, and appropriate procedures to address them were implemented (Osborne & Overbay, 2004; Schlomer, Bauman, & Card, 2010; Sterner, 2011). After data was cleaned, descriptive analysis was performed. For demographics of the sample, frequencies were reported. For the study variables, means, standard deviations, and range of responses were reported (Meyers, Gamst, & Guarino, 2013). Also, reliability analysis on all measures used in this study was performed and Cronbach alpha coefficients were reported (Lance, Butts, & Michels, 2006; Nimon, Zientek, & Henson, 2012; Osborne & Waters, 2002; Yang & Green, 2011). Assumptions of all statistical analyses performed in the current study were tested (Osborne, 2013; Osborne & Waters, 2002; Williams, Gomez Grajales, & Kurkiewicz, 2013).

Further, Pearson's correlation analyses were conducted to be able to examine the magnitude and direction of bivariate relationships between study variables. Results of correlation analyses were also needed before the scores of four adaptive emotion regulation strategies subscales and four maladaptive emotion regulation strategies subscales were combined into two total summed scores reflecting habitual use of adaptive and maladaptive emotion regulation strategies. Additionally, to determine individual predictive strength of each emotion regulation strategy correlations between scores of each emotion regulation strategy and intuitive eating (IES-2) were explored. Similarly, bivariate correlation analyses were performed to inspect relationships between variables used in

regression analysis for multicollinearity issues. Lastly, in order to evaluate the direct effect of independent variables on the dependent variable (Cohen, Cohen, West, & Aiken, 2003, p. 75), the magnitude of bivariate relationships between independent variables including unidimensional dispositional mindfulness (FFMQ), five mindfulness facets (FFMQ), two groups of emotion regulation strategies (adaptive and maladaptive), body appreciation (BAS), and the covariate body mass index (BMI) on one hand, and the dependent variable intuitive eating (IES-2) on the other hand was estimated (Hemphill, 2003; Nathans, Oswald, & Nimon, 2012). Correlation strength and direct effect size was interpreted as "small" ($r \geq .10$ and $r < .29$) , "medium" ($r \geq .30$ and $r < .49$), and "large" ($r \geq .50$) using Cohen's (1988) benchmark criteria for correlation magnitude (Cohen et al., 2003; LeBreton, Ployhart, & Ladd, 2004).

Primary data analyses. To answer Research Questions 1 - 6 and to test Hypotheses 1, 2, 3 a-b, 4 a-b, 5 a-b, and 6, hierarchical regression analyses were conducted using theory underlying development of the all regression models and previous research (Cohen et al., 2003; Pedhazur, 1997; Petrocelli, 2003; Schafer, 1991; Tabachnick & Fidell, 2013; Warner, 2012). In this study, hierarchical regression analysis was preferred to data-driven regression analysis, because hierarchical regression analysis allows to test specific, theory and empirically driven hypotheses, to specify the order of entry of independent variables, and to control for covariates (Cohen et al., 2003; Osborne, 2012; Pedhazur, 1997; Petrocelli, 2003; Schafer, 1991; Tabachnick & Fidell, 2013). Overall, nine hierarchical multiple regression analyses were conducted. In all hierarchical regression models *body mass index* (BMI) was entered to the equation in the first step as a covariate of *intuitive eating* (IES-2), getting credit for all of the variance in *intuitive eating* (IES-2) it could account for.

First, hierarchical multiple regression analysis was performed to examine the extent to which a group of independent variables comprising unidimensional dispositional *mindfulness* (FFMQ), *adaptive* and *maladaptive emotion regulation strategies* (two total scores), and *body appreciation* (BAS) would uniquely and jointly account for variance in the criterion variable of *intuitive eating*

(IES-2), while controlling for *body mass index* (BMI). The role of all these predictors in eating behaviors was established in previous research (Avalos & Tylka, 2006; Evers et al., 2010; Lavender et al., 2009; Oh et al., 2012; Sairanen et al., 2015; Svaldi, Griepenstroh, et al., 2012). Further, guided by studies which used hierarchical regression analyses to examine the unique and shared contributions of mindfulness facets to the variance in eating behaviors over and above the variance explained by covariates (e.g., Prowse et al., 2013;.Tak et al., 2015), hierarchical multiple regression analysis was employed to inspect the extent to which five *mindfulness* (FFMQ) facets (*acting with awareness, non-judging, non-reactivity, describing,* and *observing)* would uniquely and jointly explain the variance in *intuitive eating* (IES-2), while controlling for the *body mass index* (BMI). Two hierarchical regression analyses were conducted to examine the extent to which unidimensional *mindfulness* (FFMQ) added to the explanation of *intuitive eating* (IES-2) over and above the explanation provided by *body appreciation* (BAS) or *adaptive* and *maladaptive emotion regulation strategies* (two total scores). Unique contribution of *mindfulness* (FFMQ) facets to eating behaviors was previously confirmed empirically (e.g., Lavender et al., 2011; Masuda et al., 2012; Levin et al., 2014). It was also necessary to conduct two hierarchical regression analyses to determine if the inclusion of *adaptive* and *maladaptive emotion regulation strategies* total added to the explanation of *intuitive eating* (IES-2) over and above the explanation provided by unidimensional *mindfulness* (FFMQ) or *body appreciation* (BAS). The role of *adaptive* and *maladaptive emotion regulation strategies* in eating behaviors was confirmed empirically (Aldao et al., 2010; Brockmeyer et al., 2014; Svaldi et al., 2012). Furthermore, based on strong evidence indicating that *body appreciation* (BAS) is the most robust predictor of *intuitive eating* (e.g., Andrew et al., 2015b; Augustus-Horvath & Tylka, 2011; Avalos et al., 2005), two hierarchical regression analyses were conducted to examine the extent to which *body appreciation* (BAS) added to the explanation of *intuitive eating* (IES-2) over and above the explanation provided by unidimensional *mindfulness* (FFMQ) or *adaptive* and *maladaptive emotion regulation strategies* total scores. Finally, hierarchical regression analysis allowed to test a theoretically and empirically driven model of *intuitive eating* (IES-2) (e.g., Avalos &

Tylka, 2006; Barrett, 2009; Garland, Farb, et al., 2015a,b; Gottlieb et al., 2006; Gross, 1998a, b; Heatherton & Baumeister, 1991; Hölzel et al., 2011), where independent contributing variables were placed in a predetermined order according to their theoretical and empirical importance. In this model, *body mass index* (BMI) had the most distal position to *intuitive eating*, followed by *maladaptive emotion regulation strategies*, *adaptive emotion regulation strategies*, and then by unidimensional *mindfulness* (FFMQ). *Body appreciation* (BAS) had the most proximal and the most important position in the model (e.g., Andrew et al., 2015b; Avalos et al., 2005).

In all the above hierarchical regression models *body mass index* (BMI) was entered to the equation in the first step as a covariate of *intuitive eating* (IES-2). Independent variables entered to the equations in further steps, were getting credit only for the additional criterion variance they uniquely accounted for beyond variance accounted for in previous steps (i.e., Δ*R*2). Independent variables were added to regression models either individually or in blocks. The degree of relationship between independent variables and *intuitive eating* (IES-2) was reassessed with each new step by examining the change in R^2 (ΔR^2) statistics (Cohen et al., 2003; Tabachnick & Fidell, 2013). Results of *F* change test and significance of *p* values were used in order to examine if each added block contributed significantly to *intuitive eating* (IES-2) above and beyond the effects of the blocks of independent variables entered to the model in previous steps (Hoyt, Leierer, & Millington, 2006). Practical significance of the overall regression models (effect size) was estimated by R^2 reflecting the proportion of variance accounted for by a set of independent variables in multiple regression (Hoyt et al., 2006; Nathans et al., 2012). Unique amount of variance in *intuitive eating* (IES-2) explained by individual independent variables was evaluated using associated regression coefficients including *t* ratios for the individual regression slopes (*t*), standardized partial regression coefficients (β), and squared semi-partial correlation coefficients (sr^2) (Allen & Bennett, 2008; Nathans et al., 2012; Tabachnick & Fidell, 2013).

Conclusions about differences in ability of individual independent variables to explain

variance in *intuitive eating* (IES-2), was based on both significance tests and numerical differences in regression coefficients. Practical significance (unique effect size) for each independent variable was determined using squared semi-partial correlation coefficients (sr^2) (Hoyt et al., 2006; Tabachnick & Fidell, 2013; Warner, 2012). Squared semi-partial correlations (sr^2) in a hierarchical multiple regression model indicate how much unique variance each independent variable shares with the outcome when independent variables of interest entered into the equation are correlated (Cohen et al., 2003). The R^2 and sr^2 may be interpreted in a percentage variance effect size, so there was no need in the current study to provide any additional measures of effect sizes (Larson-Hall, 2009). The magnitude of the R^2 and sr^2 effect sizes was interpreted using criteria for correlation magnitude suggested by Cohen (1988) translated into proportion of variance terms (R^2, sr^2), where "small" effect size falls between .01 and .08, "medium" is between .09 and .24, and "large" effect size is more than .25. (Cohen et al., 2003).

Additional post-hoc analyses. After analyses answering Research Questions 1-6 and testing Hypotheses 1, 2, 3 a-b, 4 a-b, 5 a-b, and 6, the additional post hoc Research Questions 7, 8, 9, and 10 were asked, and post hoc Hypotheses 7 a-b, 8, 9, and 10 were proposed.

Post hoc analyses were conducted (post hoc Research Questions 7, post hoc Hypotheses 7 a-b) to better understand why *acting with awareness* mindfulness (FFMQ) facet did not significantly contribute to the variance in *intuitive eating* (IES-2) when Hypothesis 2 (Research Question 2) was tested. The lack of expected significant relationship between *acting with awareness* (FFMQ) facet and *intuitive eating* (IES-2), could be explained by another *mindfulness* (FFMQ) facet (e.g., *non-judging*) which could influence the strength of the relationship between the *acting with awareness* (FFMQ) facet and *intuitive eating* (IES-2) because of its mediating effect (e.g., Baron & Kenny, 1986; MacKinnon, Fairchild, & Fritz, 2007; MacKinnon, Krull, & Lockwood, 2000; Hayes, 2009, 2013). Thus, it was expected (Hypothesis 7a) that when only four mindfulness facets (excluding the *non-judging* facet) would be entered to the regression model, the a*cting with awareness* facet would

account for a unique significant portion of variance in *intuitive eating* (IES-2). Further, it was predicted (post hoc Hypothesis 7b) that the *non-judging* mindfulness (FFMQ) facet would mediate the relationship between the *acting with awareness* mindfulness (FFMQ) facet and *intuitive eating* (IES-2). Post hoc Hypotheses 7 b was based on mindfulness theory suggesting that the *non-judging* quality of mindfulness is an important mechanism through which *acting with awareness* (FFMQ) mindfulness facet is linked to improved mental health (Bishop et al., 2004; Vujanovic, Bonn-Miller, Bernstein, McKee, & Zvolensky, 2010) and eating behaviors specifically (Park, Dunn, & Barnard, 2011). Furthermore, analysis to test post hoc Hypothesis 8 (post hoc Research Question 8) was conducted based on the analysis testing Hypothesis 5a (Research Question 5), which suggested that *body appreciation* (BAS) could mediate the relationship between dispositional unidimensional *mindfulness* (FFMQ) and *intuitive eating* (IES-2) because the association between unidimensional *mindfulness* (FFMQ) and *intuitive eating* (IES-2) was reduced when *body appreciation* (BAS) was entered to the model in the third step (MacKinnon et al., 2000, 2007; Hayes, 2009, 2013). According to the mindfulness theory (e.g., Hölzel et al., 2011), it was hypothesized that dispositional *mindfulness* (FFMQ) could affect *intuitive eating* (IES-2) through cognitive, emotional, and interoceptive components of *body appreciation* (BAS). Finally, post hoc analysis to test Hypothesis 9 (post hoc Research Question 9) was performed to explore the mediating role of *body appreciation* (BAS) in the relationship between *adaptive emotion regulation strategies* and *intuitive eating* (IES-2). Post hoc Hypothesis 9 was based on the results of the analysis testing Hypothesis 5b which demonstrated that the magnitude of the relationship between *adaptive emotion regulation strategies* total score and *intuitive eating* (IES-2) was reduced after *body appreciation* (BAS) was added to the model. Analysis testing Hypothesis 5b suggested that *body appreciation* (BAS) could be a mediating variable through which *adaptive emotion regulation strategies* total score exerted its effect on *intuitive eating* (IES-2). Similarly, analysis to test the post hoc Hypothesis 10 (post hoc Research Question 10) was conducted to answer the question about the mediating role of *body appreciation* (BAS) in the relationship between *maladaptive emotion regulation strategies* (total score) and

intuitive eating (IES-2) based on the reduced contribution of *maladaptive emotion regulation strategies* (total score) after *body appreciation* (BAS) was entered to the model in the analysis testing Hypothesis 5b (Research Question 5).

Mediation analyses (Hayes, 2013) were conducted to estimate for the magnitude and significance of the indirect effect of the *acting with awareness* mindfulness (FFMQ) facet on *intuitive eating* (IES-2) through the *non-judging* mindfulness (FFMQ) facet (post Hoc Research Question and Hypothesis 7b), the indirect effect of unidimensional dispositional *mindfulness* (FFMQ) on *intuitive eating* (IES-2) through *body appreciation* (BAS) (post Hoc Research Question 8 and post hoc Hypothesis 8), the indirect effect of *adaptive emotion regulation strategies* on *intuitive eating* (IES-2) through *body appreciation* (BAS) (post Hoc Research Question 9 and post hoc Hypothesis 9), and the indirect effect of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) through *body appreciation* (BAS) (post Hoc Research Questions 10 and post hoc Hypotheses 10). In this study mediation analyses were implemented using a well-accepted, nonparametric bootstrapping approach based on OLS regression path analyses (Hayes, 2013). Due to its multiple benefits (Field, 2013; Hayes, 2009; MacKinnon et al., 2000; MacKinnon et al., 2007; Mallinckrodt, Abraham, Wei, & Russell, 2006; Rucker, Preacher, Tormala, & Petty, 2011; Shrout & Bolger, 2002; Zhao, Lynch, & Chen, 2010), the bootstrapping method has been recently preferred by researchers to traditional and the most common Baron and Kenny's three-step approach (Baron & Kenny, 1986) and to Sobel Test (Sobel, 1982, 1986). The bootstrapping mediation approach has been recently used in research on mindfulness, emotion regulation, and eating behaviors (Berking et al., 2012; Masuda & Wendell, 2010; Osberg & Eggert, 2012; Prakash, Whitmoyer, Aldao, & Schirda, 2015; Reese, Zielinski, & Veilleux, 2015; Schoenefeld, & Webb, 2013; Southward et al., 2014;).

Bootstrapping was performed via PROCESS, an easily accessible SPSS macro, installed from www.processmacro.org (IBM Corporation, New York, USA; Hayes, 2013). The PROCESS macro generated non-parametric bootstrap resampling estimates for the magnitude and significance of the

indirect effect based on 5,000 bootstrap sampling repetitions. Significance of results was determined based on 95% bias-corrected confidence intervals (BCa CIs), when confidence intervals did not cross (did not contain) zero at alpha level set at .05 (Hayes, 2013; Preacher & Hayes, 2004; Shrout & Bolger, 2002). As recommended by Preacher and Kelley (2011), kappa-squared value (k^2) representing the ratio of the obtained indirect effect to the maximum possible indirect effect was used to assess the magnitude of indirect effects. Kappa-squared values (k^2) were interpreted as follows: .01 is a small effect, .09 is a medium effect, and .25 as a large effect (Preacher & Kelley, 2011). Following recommendations by Hayes (2013), the model coefficients, direct, indirect, and total effects were reported in unstandardized form allowing to directly compare results of the analysis performed in this study (equations, regression coefficients, etc.) to other studies using the same measurement scales. Additionally, results of the Normal theory Sobel test for the indirect effect in a simple mediation model provided by PROCESS were also reported (Sobel, 1982, 1986).

For all statistical tests conducted in this study including hierarchical regression analyses, and mediation analysis, significance *p*-value of .05 was established (APA, 2010; Cohen, 1988; Pedhazur, 1997; Vogt, 2007).

CHAPTER III

RESULTS

The purpose of the study was to examine relationships of dispositional mindfulness, adaptive and maladaptive emotion regulation strategies, and body appreciation to intuitive eating behaviors in a sample university-recruited female emerging adults. Research questions, hypotheses, and conducted analyses were guided by mindfulness, emotion-regulation, intuitive eating, and systems theory, as well as previous research. This chapter presents results of *preliminary analyses* including procedures addressing erroneous and missing data, descriptive analyses, reliability analysis, tests of assumptions, correlational analyses, *primary analyses* testing the study hypotheses, and *post-hoc analyses*.

Preliminary Analyses

Preliminary data analysis included results of cleaning procedures performed in order to identify and deal with erroneous data, missing data, outliers, and extreme cases; results of descriptive analysis of demographics and study variables; results of reliability analysis; results of tests of assumptions, and to results of correlational analysis pertinent to bivariate relationships among study variables.

Erroneous and Missing Data Analysis

Attention check questions were used to identify inattentive participants, and only those participants who answered two out of three attention checks correctly were considered passing.

Overall, from the initially signed 454 participants, 19 responders who missed one out of three attention checks were removed from analyses (e.g., Berinsky et al., 2014; Oppenheimer et al., 2009). Further, responses from 13 responders with repeated identification numbers were removed from the data. Additionally, 14 responses from participants who signed the informed consent without completing the survey, were removed from analysis as responses which could create uncontrollable issues for the researcher (Hair, Black, Babin, Anderson, & Tatham, 2006). These procedures generated a sample size of 401 (a total loss of 10%).

Further, data were inspected for inconsistencies and obvious errors, including examination of the minimum and maximum values, and means and standard deviations for each variable (Leech, Barrett, & Morgan, 2014). Responses potentially causing erroneous data were identified and deleted from the data (Meade & Craig, 2011; Osborne, 2012). Steps to identify, manage, and report missing data were taken (Cohen et al., 2003; Schlomer, Bauman, & Noel, 2010; Sterner, 2011; Tabachnick & Fidel, 2013). Missing data analysis with the use of the SPSS multiple-imputation (MI) procedure was performed to provide an overall summary of missing values. Results suggested that eleven variables had missing values for at least 73% of the sample. Out of 401 participants, 70 participants (17.46%) provided responses with missing values. Overall, 1.4% of values were missing, which was a relatively insignificant amount of missing values (Tabachnick & Fidel, 2013).

To establish whether the type of missing data was either ignorable (MCAR, MAR) or nonignorable (MNAR) (Rubin, 1976), the Little's (1988) MCAR test performed under the SPSS Missing Values Analysis (MVA) command was run. The chi-square Little’s test for all variables was not statistically significant ($p > .05$), which indicated that the data was MCAR. Further, the SPSS two-step procedure of Expectation Maximization (EM), an “unbiased and efficient” way to impute randomly missing data (Graham et al., 2003, p. 94), was performed. The EM procedure was preferred to mean substitution and listwise deletion, methods that potentially may lead to misleading results (Allison, 2001; Bennett, 2001; Graham et al., 2003; Tabachnick & Fidel, 2013).

The imputed data set was examined on univariate and multivariate level for the presence of outliers and extreme cases (Osborne & Overbay, 2004). In order to identify univariate outliers, histograms and boxplots of the study variables including subscales and composite scales were visually evaluated. Also, the SPSS explore command allowed to examine standardized z scores of the study variables searching for potential outliers with standardized z scores with values greater than or equal to +/- 3.29 ($p < .001$, two-tailed test) (Tabachnick & Fidel, 2013). Once seven potential outliers were located, data was inspected for cases with an unusual combination of values on two or more of the variables on the multivariate level. After running the regression analyses, nine cases with multivariate outliers were identified having the Mahalanobis distances exceeding the critical chi square values which depended on the degrees of freedom equal to the number of variables used in each analyses (Meyers et al., 2013; Stevens, 1984). Cases which had multivariate and univariate outliers were inspected together, and seven cases which exhibited both univariate and multivariate outliers across several regressions were identified and deleted from the data, leaving 394 participants in the final data set.

Descriptive Statistics

Demographic information. The study sample used for analysis comprised 394 female participants with an average age of 21.09 (*SD* = 2.07). Description of the sample is provided in the Methods section with frequencies for participants' age, ethnic identification, religion, academic status, employment status, and relationship status displayed in Table 1.

Study variables. Before data analysis of the survey items began, the descriptive statistics of the study scales and subscales (means, standard deviations, and range for summed and averaged scale composite scales and subscales scores, Cronbach's coefficient alphas, and number of items) necessary to support statistical conclusions were calculated (see Table 2). Following recommendation given by Gross (2015a), and Aldao and Christensen (2015) to measure joint effectiveness and adaptiveness of a

"blend of strategies" (Gross, 2015a, p. 16) implemented in relation to the enactment of a particular behavior, two total scores measuring dispositional tendency to use adaptive and maladaptive emotion regulation strategies were used to test the study hypotheses.

Table 2

*Means, Standard Deviations, Range, Reliability, and N of Items for the Study Scales and Subscales (*N=*394)*

Scales and Subscales	M_{sum}	SD_{sum}	$Range_{sum}$	M_{aver}	SD_{aver}	$Range_{aver}$	α	Items
IES-2 Intuitive Eating Composite	74.99	11.84	13-65	3.26	.52	2-5	.85	23
BAS Body Appreciation	46.05	10.37	42-108	3.54	.80	1-5	.93	13
FFMQ Mindfulness Total	125.20	16.67	72-179	3.21	.43	2-5	.88	39
FFMQ Non-reactivity	20.74	3.94	10-34	2.96	.56	1-5	.73	7
FFMQ Observing	26.48	4.92	12-39	3.31	.62	2-5	.76	8
FFMQ Acting with Awareness	24.74	5.83	9-40	3.09	.73	1-5	.87	8
FFMQ Non-judging	25.72	6.60	9-40	3.21	.83	1-5	.90	8
FFMQ Describing	27.51	5.68	8-40	3.44	.71	1-5	.89	8
ER Adaptive Strategies Total	50.83	10.24	16-78	3.18	.64	1-5	.89	16
ER Cognitive Problems Solving	13.02	3.06	4-20	3.26	.77	1-5	.77	4
ER Positive Reappraisal	14.19	3.41	4-20	3.55	.85	1-5	.81	4
ER Acceptance of Emotions	11.53	3.18	4-20	2.88	.80	1-5	.73	4
ER Behavioral Problems Solving	12.08	3.16	4-20	3.02	.79	1-5	.76	4
ER Maladaptive Strategies Total	53.29	12.34	22-94	2.66	.62	1-5	.88	20
ER Mental Distraction	11.21	3.08	4-20	2.80	.77	1-5	.71	4
ER Expressive Suppression	10.24	3.67	4-20	2.56	.92	1-5	.82	4
ER Self-Critical Rumination	15.69	4.83	6-29	2.61	.80	1-5	.83	6
ER Behavioral Avoidance	16.16	4.31	7-29	2.69	.72	1-5	.68	6
BMI Body Mass Index	24.72	5.25	10-45	-	-	-	-	-

Notes. M_{sum} = mean of the summed score; SD_{sum} = standard deviation of the summed score; $Range_{sum}$ = range of the summed score; M_{aver} = mean of the averaged score; SD_{aver} = standard deviation of the averaged score; $Range_{aver}$ = range of the averaged score; α = Cronbach's coefficient alpha; Items = number of items in the scale/subscale.

Before these scores were computed, Pearson correlation analysis was conducted to measure bivariate relationships between eight *emotion regulation strategies* subscale scores and the *intuitive eating* (IES-2) score to make sure that *adaptive emotion regulation strategies* have a positive relationship with *intuitive eating* (IES-2) and *maladaptive emotion regulation strategies* have a negative relationship with *intuitive eating* (IES-2). The correlational matrix for these variables is

presented in Table 3.

Reliability Analysis

To assess reliability of the study scales, Cronbach's alphas for all measures were computed (see Table 2). Most alphas were acceptable, good, or even excellent ranging from α = .73 to α = .93 suggesting relatively acceptable levels of measurement error (Nimon et al., 2012; Lance et al., 2006; Nunnally, 1978; Osborne & Waters, 2002; Yang & Green, 2011). More particularly, Cronbach's alpha coefficient for the total score of the 23-item *Intuitive Eating* scale (IES-2) was good (α = .85), which was comparable with the IES-2 total score Cronbach's alpha (α =.87) calculated by Tylka and Kroon Van Diest (2013). Cronbach's alpha for the *Body Appreciation* scale (BAS) was excellent (α = .93), which was comparable with BAS Cronbach's alpha (α = .91) measured by Avalos and colleagues (2005). Cronbach's alpha for the single-factor *Mindfulness* scale (FFMQ) was good (α = .88) in the current sample, consistent with the Cronbach's alpha for the *Mindfulness* scale (FFMQ) (α = .88) reported by Lattimore and colleagues (2011) in their research study on mindfulness and eating behaviors among college students. Likewise, Cronbach's alphas for five FFMQ *Mindfulness* subscales including the N*on-reactivity* subscale (α = .73), the *Observing* subscale (α = .76), the *Acting with Awareness* subscale (α = .87), the *Non-judging* subscale (α = .90), and the *Describing* subscale (α = .89) were ranging from adequate to good and were comparable to those measured by Lattimore and colleagues (2011). In their study Cronbach's alphas for *Non-reactivity* (α = .75), *Observing* (α = .80), *Acting with awareness* (α = .86), *Non-judging* (α = .90), and *Describing* (α = .87) subscales were ranging from adequate to excellent. Cronbach's alpha coefficient for the single factor *Adaptive Emotion Regulation Strategies* scale measuring four putatively adaptive emotion regulation strategies including *cognitive problems solving, cognitive positive reappraisal, cognitive acceptance of emotions,* and *behavioral problems solving,* was good (α = .89). Alpha coefficient for the single factor *Maladaptive Emotion Regulation Strategies* scale measuring four putatively maladaptive emotion regulation strategies namely *thought suppression/mental distraction, expressive suppression, self-*

critical rumination, and *behavioral avoidance*, was also good (α = .88). Additionally, alpha coefficients for eight specific emotion regulation strategies subscales are presented in Table 2.

Tests of Assumptions

In order to assess the appropriateness of the data for correlation and regression analyses, and to avoid Type I-Type II errors and over- or under-estimation of significance of effect size, assumptions of normality, linearity, independence, homoscedasticity, and multicollinearity were tested using general recommendations provided by Tabachnick and Fidell (2013), Osborne and Waters (2002), and specific suggestions outlined by Lomax and Hahs-Vaughn (2012).

First, visual inspection of the shape of the distribution was used to test the normality of the distribution. After removal of outliers, the preanalysis frequency histograms and box plots for each variable displayed a relatively normal distributional shape of the residuals. Due to limitations of robust statistical tests with large sample sizes, the Kolmogorov–Smirnov and Shapiro–Wilk tests were not used to test the normality of distributions of the study variables. However, the skewness and kurtosis statistics for the study variables were computed, falling between the acceptable range of below +1.5 and above -1.5 (Tabachnick & Fidell, 2013). On bivariate level, the normal Q-Q plots with dots representing data points positioned approximately along the diagonal line and oval-shaped scatterplots for pairs of independent variables and the dependent variable provided more information on the normality of the data. On the multivariate level, data residuals were screened for normality using histogram with superimposed normal curve provided with each conducted regression analysis and plots of the standardized residuals as a function of standardized predicted values. Case wise diagnostics using Mahalanobis distance values were performed, and seven influential points were identified and removed from the data. Together, results of these procedures indicated that the normality assumption was satisfied.

Further, the assumption of linearity was tested by examination of linear relations among

variables with a series of scatter plots including partial regression plots of each independent variable and the dependent variable, and scatterplots of unstandardized residuals and predicted values showing a random display of points falling within an absolute value of 2. The assumption of independence of observations requiring that errors of predictor variables to be independent of one another, was tested through residuals analysis, by finding a randomly display of points in the scatterplot of studentized residuals against values of the independent variables and studentized residuals against predicted values. Additionally, the Durbin-Watson test statistic for each regression analysis did not exceed the acceptable value of two (Cohen et al., 2003), suggesting that the assumption of independent errors was met for all regressions.

Similarly, scatterplots of studentized residuals against predicted values and studentized residuals against values of the independent variable were visually inspected to address the homoscedasticity (homogeneity of variance) of variance assumption providing evidence of relatively random display of points, where the residuals appear equally spread over the range of values of independent variables. Random and fairly constant spread of residuals over the range of values of the independent variables (in the scatterplots of studentized residuals against predicted values and studentized residuals against values of the independent variables) provided evidence of homogeneity of variance.

The assumption of multicollinearity was assessed reviewing the Variance Inflation Factor (VIF) and Tolerance statistics. In all regression analyses Tolerance values were well above .2 and VIF statistics were well below 5, indicating that multicollinearity was not an issue. Additionally, Person's correlations were calculated to evaluate bivariate relationships between independent variables used in regression analyses (see Table 4) were examined. Findings indicated that all bivariate relationships between study variables were acceptable with no correlations exceeding Ferguson's (2009) cut-off criterion of $r = .80$ (see results of correlation analyses). Thus, the above results indicated that there were no problems with multicollinearity, suggesting that all independent variable could be included

into the regression analyses.

Correlational Analyses

Zero order Pearson's bivariate correlation analyses were conducted to examine the magnitude and direction of bivariate relationships between study variables. Correlation strength was interpreted using the standard criteria for effect size established by Cohen (1988) as "small" ($r \geq .10$ and $r < .29$) , "medium" ($r \geq .30$ and $r < .49$), and "large" ($r \geq .50$).

Correlations between eight emotion regulation strategies and study variables. Following recommendation given by Gross (2015a), and Aldao and Christensen (2015) to measure joint effectiveness and adaptiveness of a "blend of strategies" (Gross, 2015a, p. 16) implemented in relation to the enactment of a particular behavior, two total scores measuring dispositional tendency to use adaptive and maladaptive emotion regulation strategies were used to test the study hypotheses. To be able to combine scores of *adaptive emotion regulation strategies* subscales and *maladaptive emotion regulation strategies* subscales into two total summed scores Pearson's correlation analysis was conducted to measure bivariate relationships between four *adaptive emotion regulation strategies* and four *maladaptive emotion regulation strategies* (see Table 3). Moreover, Pearson's correlation analysis was performed to verify that four *adaptive emotion regulation strategies* scores have a positive relationship with the *intuitive eating* (IES-2) score and four *maladaptive emotion regulation strategies* have a negative relationship with the *intuitive eating* (IES-2) score.

Results of Pearson's correlation analysis indicated that bivariate relationships between all four *adaptive emotion regulation strategies* were significant and positive, ranging from medium to large in magnitude. The strongest relationships were between *behavioral problem solving* and *cognitive problem solving* ($r = .75$, $p < .001$), between *behavioral problem solving* and *positive reappraisal* ($r = .58$, $p < .001$), and between *positive reappraisal* and *cognitive problem solving* ($r = .65$, $p < .001$). The weakest relationship was found between *cognitive problem solving* and

acceptance of emotions (r = .35, p < .001). Thus, findings indicated that *adaptive emotion regulation strategies* scores were significantly related to each other and could be combined to form a summed *adaptive emotion regulation strategies* total score. Likewise, results of Pearson's correlation analysis demonstrated that relationships between *maladaptive emotion regulation strategies* were significant and positive, ranging from small to medium in magnitude. The strongest relationships were found between *behavioral avoidance/ distraction* and *mental distraction* ($r = .62$, $p < .001$), and between *expressive suppression* and *mental distraction* ($r = .57$, $p < .001$). The weakest relationship was revealed between *self-criticism/rumination* and *mental distraction* ($r = .29$, $p < .001$). Thus, results of correlation analyses suggested that *maladaptive emotion regulation strategies* scores were significantly related to each other and could be combined to form a summed *adaptive emotion regulation strategies* total score.

Table 3

*Intercorrelations for Adaptive Emotion Regulation Strategies, Maladaptive Emotion Regulation Strategies, and Intuitive Eating (*N=*394)*

Variables	1	2	3	4	5	6	7	8	9
1. Intuitive Eating	-								
2. Cognitive Problem Solving	.22**	-							
3. Positive Reappraisal	.30**	.65**	-						
4. Acceptance of Emotions	.24**	.36**	.41**	-					
5. Behavioral Problem Solving	.20**	.75**	.58**	.37**	-				.
6. Mental Distraction	-.13*	.05	.13*	.03	.06	-			
7. Expressive Suppression	-.14**	-.03	-.05	-.27**	-.12*	.57**	-		
8. Self-Criticism/Rumination	-.27**	.09	-.06	-.09	.03	.29**	.38**	-	
9. Behavioral Avoidance/Distraction	-.23**	.03	.01	.05	.03	.62**	.49**	.49**	-

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Further, Pearson's correlation analysis indicated that relationships between *adaptive emotion regulation strategies* and *intuitive eating* (IES-2) were significant and positive, ranging from small to medium in magnitude. Findings demonstrated that *intuitive eating* had the strongest relationship with *positive reappraisal* ($r = .30$, $p < .001$), followed by the relationship by the relationship with

acceptance of emotions ($r = .24$, $p < .001$), *cognitive problem solving* ($r = .22$, $p < .001$), and *behavioral problem solving* ($r = .20$, $p < .001$). Relationships between *maladaptive emotion regulation strategies* scores and *intuitive eating* (IES-2) were significant, negative, and small. *Intuitive eating* had the strongest relationship with *self-criticism/rumination* ($r = -.27$, $p < .001$), followed by the relationship with *behavioral avoidance/ distraction* ($r = -.23$, $p < .001$), *expressive suppression* ($r = -.14$, $p = .007$), and *mental distraction* ($r = -.13$, $p = .012$).

Correlations between total scores of all study independent variables. In order to conduct hierarchical regression analyses Pearson's correlation analyses were run for all study independent variables (see Table 4). Findings revealed that unidimensional *mindfulness* (FFMQ) had a significant positive medium relationship with *body appreciation* (BAS) ($r = .47$, $p < .001$), a significant negative medium relationship with the *maladaptive emotion regulation strategies* total score ($r = -.40$, $p < .001$), and a significant positive large relationship with *adaptive emotion regulation strategies* total score ($r = .51$, $p < .001$). Unidimensional *mindfulness* (FFMQ) ($r = -.04$, $p = .483$) did not have a significant relationship with *body mass index* (BMI). Findings indicated that *adaptive emotion regulation strategies* and *maladaptive emotion regulation strategies* total scores were not significantly correlated ($r = -.01$, $p = .796$). *Adaptive emotion regulation strategies* total score had a significant positive medium relationship with *body appreciation* (BAS) ($r= .38$, $p < .001$), and was not significantly correlated with *body mass index* ($r = -.06$, $p = .239$). *Maladaptive emotion regulation strategies* total score had a significant negative small relationship with *body appreciation* ($r= -.21$, $p < .001$) and a significant positive small relationship with *body mass index* ($r = .18$, $p < .001$). *Body appreciation* had a significant negative small relationship with *body mass index* ($r = -.30$, $p < .001$). Thus, no correlations between the study total scales scores exceeding the cut-off criteria ($r = .80$) suggested by Ferguson (2009) were revealed.

With regard to the relationships between independent variables and the criterion variable *intuitive eating* (IES-2), Pearson's correlation analyses showed that each independent variable was

linearly related to *intuitive eating* (IES-2) demonstrating significant relationships ranging from small to large in magnitude. Specifically, *intuitive eating* had the strongest relationship with *body appreciation* (BAS) (r = .60, p < .001), followed by the relationship with unidimensional *mindfulness* (FFMQ) (r = .43, p < .001), *adaptive emotion regulation strategies* total score (r = .30, p < .001), and *maladaptive emotion regulation strategies* total score (r = - .26, p < .001). Finally, in order to include *body mass index* (BMI) as a covariate in all subsequent analyses (Tabachnick & Fidell, 2013), Pearson's correlation analysis was conducted between *intuitive eating* (IES-2) and *body mass index* (BMI). Findings revealed a relationship which was significant, negative, and small (r = - .21; p < .001), suggesting that *body mass index* (BMI) could be included as a covariate into all hierarchical regression analyses performed in this study.

Table 4

*Intercorrelations Between All Study Variables (*N=*394)*

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Intuitive Eating	-										
2. Body Appreciation	.60**	-									
3. FFMQ Mindfulness	.43**	.47**	-								
4. Observing	.17**	.20**	.43**	-							
5. Describing	.31**	.27**	.72**	.31**	-						
6. Non-judging	.31**	.37**	.66**	-.13*	.27**	-					
7. Non-reactivity	.27**	.33**	.52**	.29**	.25**	.14*	-				
8. Acting with Awareness	.26**	.26**	.71**	.02	.34**	.50**	.17**	-			
9. ER Adaptive Strategies	.30**	.38**	.51**	.31**	.47**	.24**	.35**	.23**	-		
10. ER Maladaptive Strategies	-.26**	-.21**	-.40**	.18**	-.30**	-.46**	.003	-.49**	-.01	-	
11. BMI Body Mass Index	-.21**	-.30**	-.04	.15**	-.02	-.19**	.09	-.05	-.06	.18**	-

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Finally, Pearson's correlation analyses were performed to assess bivariate relationships among all five *mindfulness* (FFMQ) facets for multicollinearity issues (See Table 4). According to the results, the strongest bivariate relationship was between the *acting with awareness* facet and the *non-judging* facet revealing a significant, positive, and large correlation (r = .50, p < .001). Significant,

positive, and medium in magnitude correlations were also found between the *acting with awareness* facet and the *describing* facet ($r = .34$, $p < .001$), and between the *describing* facet and the observing facet ($r = .31$, $p < .001$). Significant and positive small correlations were found between the *non-reactivity* facet and the *observing* facet ($r = .29$, $p < .001$), the *describing* facet ($r = .25$, $p < .001$), the *acting with awareness* facet ($r = .17$, $p = .001$), and the *non-judging* facet ($r = .14$, $p = .007$). The relationship between the *observing* facet and the *non-judging* facet significant, negative, but very small ($r = -.13$, $p = .013$). Finally, the relationship between the *observing* facet and the *acting with awareness* facet ($r = .02$, $p = .731$) was not statistically significant.

In terms of bivariate relationships between *mindfulness* (FFMQ) facets and *body mass index* (BMI), findings revealed that only two mindfulness facets were significantly related to *body mass index* (BMI). There was a negative and small correlation between *body mass index* (BMI) and the *non-judging* mindfulness facet ($r = -.19$, $p < .001$), and a positive and small correlation between *body mass index* (BMI) and the *observing* facet ($r = .15$, $p = .004$). Correlations between *body mass index* (BMI) and three other mindfulness facets including *non-reactivity* ($r = .09$, $p = .076$), *acting with awareness* ($r = -.05$, $p = .281$), and *describing* ($r = -.02$, $p = .683$) were statistically insignificant. To summarize, there was no indication of multicollinearity because no correlations exceeding Ferguson's (2009) cut-off criteria ($r = .80$) were found among five FFMQ *mindfulness* facets and *body mass index* (BMI). Additionally, Pearson's correlation analyses were conducted to explore bivariate relationships between *mindfulness* (FFMQ) facets and other study variables including body appreciation (BAS) and *emotion regulation strategies* total scores. Correlation analysis indicated that while the *non-judging* facet ($r = .37$, $p < .001$) and the *non-reactivity* facet ($r = .33$, $p < .001$) had positive and moderate bivariate relationships with *body appreciation* (BAS), the *describing* facet ($r = .27$, $p < .001$), the *acting with awareness* facet ($r = .26$, $p < .001$), and the *observing* facet ($r = .20$, $p < .001$) had positive but small relationships with *body appreciation* (BAS).

As to the bivariate relationships between five *mindfulness* (FFMQ) facets and participants'

habitual use *of adaptive* and *maladaptive emotion regulation strategies* (See Table 4), all five *mindfulness* (FFMQ) facets were significantly and positively related to *adaptive emotion regulation strategies* total score. Specifically, the *describing* facet (r = .47, p < .001), the *non-reactivity* facet (r = .35, p < .001), and the *observing* facet (r = .31, p < .001) demonstrated moderate in magnitude relationships with *adaptive emotion regulation* strategies. However, both the *non-judging* facet (r = .24, p < .001) and the *acting with awareness* facet (r = .23, p < .001) had small in magnitude relationships with the *adaptive emotion regulation strategies* total score. Furthermore, *maladaptive emotion regulation strategies* total score had significant, positive, and moderate correlations with the *acting with awareness* facet (r = - .49, p < .001), the *non-judging* facet (r = - .46, p < .001), and the *describing* facet (r = - .30, p < .001). The relationship between the *maladaptive emotion regulation strategies* total score and the *observing* facet (r = .18, p < .001) was positive and small in magnitude. The *non-reactivity* facet was not statistically related to *maladaptive emotion regulation strategies* (r = .003, p = .951).

Primary Analyses

To answer Research Questions 1 - 6 and to test Hypotheses 1, 2, 3 a-b, 4 a-b, 5 a-b, and 6, hierarchical regression analyses were conducted. Theory and previous research findings were used to develop all regression models (Cohen et al., 2003; Petrocelli, 2003; Pedhazur, 1997; Tabachnick & Fidell, 2013; Schafer, 1991; Warner, 2012). The magnitude of the R^2 and sr^2 effect sizes was interpreted using criteria suggested by Cohen (1988) translated into proportion of variance terms (R^2, sr^2), where "small" effect size was falling between .01 and .08, "medium" effect size was falling between .09 and .24, and "large" effect size was equal or exceeding .25 (Cohen et al., 2003).

Research Question 1

The first Research Question addressed the extent to which unidimensional dispositional *mindfulness* (FFMQ), *adaptive* and *maladaptive emotion regulation strategies*, and *body appreciation*

(BAS) may jointly and uniquely account for variance in *intuitive eating* (IES-2) over and above the variance accounted for by *body mass index* (BMI).

Hypothesis 1. It was hypothesized that entered together as a set, unidimensional dispositional *mindfulness* (FFMQ), *adaptive* and *maladaptive emotion regulation strategies*, and *body appreciation* (BAS) would account for a unique and shared significant variance in *intuitive eati*ng (IES-2) above and beyond the contribution of *body mass index* (BMI). The contribution of *mindfulness* (FFMQ), *adaptive emotion regulation strategies*, and *body appreciation* (BAS) to *intuitive eatin*g (IES-2) was expected to be positive, and the contribution of *maladaptive emotion regulation strategies* to *intuitive eating* (IES-2) was expected to be negative.

To test Hypothesis 1, a hierarchical multiple regression analysis was conducted (see Table 5). In the first step of the regression equation, *body mass index* (BMI) significantly accounted for about 4 % of the variance in *intuitive eating* (IES-2) [$R^2 = .04$, F (1, 392) = 17.13, $p < .001$]. The four independent variables of primary interest were entered to the model simultaneously in the second step, while controlling for *body mass index* (BMI). Addition of four variables resulted in a significant increase in R^2, with $\Delta R^2 = .36$, ΔF (4, 388) = 57.24, $p < .001$, explaining 36% of additional shared variance in *intuitive eating* (IES-2) equal to a large effect size (Cohen et al., 2003). As anticipated, unidimensional dispositional *mindfulness* (FFMQ) ($t = 2.75$, $\beta = -.15$, $sr^2 = .01$, $p = .006$) and *body appreciation* (BAS) ($t = 10.17$, $\beta = .49$, $sr^2 = .16$, $p < .001$) accounted for significant amount of unique variance in *intuitive eating* (IES-2). The direction of the associations between *mindfulness* (FFMQ) and *intuitive eating* (IES-2), and *body appreciation* (BAS) and *intuitive eating* (IES-2) was positive. Contrary to prediction, total scores of *adaptive emotion regulation strategies* ($t = .75$, $\beta = .04$, $sr^2 = .001$, $p = .453$) and *maladaptive emotion regulation strategies* ($t = -1.97$, $\beta = -.09$, $sr^2 = .01$, $p = .050$) did not significantly contribute to *intuitive eating* (IES-2). However, compared to the contribution of *adaptive emotion regulation strategies*, the contribution of *maladaptive emotion regulation strategies* almost reached the adopted significance level.

Based on sr^2, *body appreciation* (BAS) was the strongest contributor to *intuitive eating* (IES-2), explaining 16 % of unique variance in *intuitive eating* (IES-2) above and beyond variance explained by *body mass index* (BMI), indicating a medium in magnitude effect size (Cohen et al., 2003). Unidimensional dispositional *mindfulness* (FFMQ) explained only 1 % of the variance in *intuitive eating* (IES-2), equal to small effect size. The full regression model was significantly greater than zero, accounting for 40 % of the variance in *intuitive eating*, $R^2 = .40$, F (5, 388) = 51.19, $p < .001$, suggesting a large in magnitude effect size.

Table 5

Hierarchical Regression Analysis for Contributions of Unidimensional Mindfulness, General Use of Adaptive and Maladaptive Emotion Regulation Strategies, and Body Appreciation to Intuitive Eating (N = 394)

Step and Variable	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.40	.36						
BMI Body Mass Index			-.003	.004	-.03	-.80	.001	.424
FFMQ Mindfulness			.01	.002	.15	2.75	.01	.006
ER Adaptive Strategies			.002	.002	.04	.75	.001	.453
ER Maladaptive Strategies			-.004	.002	-.09	-1.97	.01	.050
BAS Body Appreciation			.32	.03	.49	10.17	.16	.000

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

Thus, Hypothesis 1 was partially supported, because only *body appreciation* (BAS) and dispositional *mindfulness* (FFMQ) accounted for a unique proportion of variance in *intuitive eat*ing (IES-2) over and above the variance explained by *body mass index* (BMI). However, as hypothesized, as a set, unidimensional *mindfulness* (FFMQ), habitual use of *adaptive and maladaptive emotion regulation* strategies, and *body appreciation* (BAS) jointly accounted for a significant proportion of variance in *intuitive eating* (IES-2) over and above the variance accounted for by *body mass index* (BMI).

Research Question 2

Research Question 2 addressed the extent to which five dispositional *mindfulness (FFMQ)* facets including *describing, non-judging, non-reactivity, acting with awareness,* and *observing* may jointly and uniquely account for the variance in *intuitive eating* (IES-2) over and above the variance accounted for by *body mass index* (BMI).

Hypothesis 2. It was hypothesized that five facets of dispositional *mindfulness* (FFMQ) namely *describing, non-judging, non-reactivity, acting with awareness,* and *observing* would account for shared and unique significant variance in *intuitive eating* (IES-2) while controlling for *body mass index* (BMI).

Hierarchical regression analysis presented in Table 6 was performed to test Hypothesis 2. *Body mass index* (BMI) was a significant contributor to *intuitive eating* (IES-2) in step one [$R^2 = .04$, F (1, 392) = 17.13, $p < .001$]. Five facets of dispositional *mindfulness* (FFMQ) were entered to the model in the second step, significantly adding to the change in R^2 and accounting for an additional 19% of the variance in *intuitive eating* (IES-2), $R^2, \Delta R^2 = .19$, ΔF (5, 387) = 19.16, $p < .001$, equal to a medium effect size. Furthermore, only four of the *mindfulness* (FFMQ) facets uniquely and significantly contributed to the variance in *intuitive eating* (IES-2) in the final step of the model, namely *observing* (t =2.53, β = .13, $sr^2 = .01$, $p = .012$), *describing* (t =2.85, β = .15, $sr^2 = .02$, p = .005), *non-judging* (t = 3.55, β = .19, $sr^2 = .025$, $p < .001$), and *non-reactivity* (t = 3.73, β = .18, sr^2 = .028, $p < .001$). The *non-reactivity* facet explained the largest portion of unique variance (2.8%) in *intuitive eating* (IES-2), based on sr^2, indicating a small effect size. The direction of unique association between these four facets of dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2) was positive. The *acting with awareness* facet did not significantly account for a unique variance in *intuitive eating* (t = 1.28, β = .07, $sr^2 = .003$, $p = .202$). The resulting full model explained 23 % of variance *in intuitive eating* (IES-2) and was significantly greater than zero, $R^2 = .23$, F (6, 387) =

19.48, $p < .001$, suggesting an effect size, which was small but was close to medium (Cohen et al., 2003).

Table 6

Hierarchical Regression Analysis for Contribution of Five Mindfulness Facets to Intuitive Eating (N = 394).

Step and Variable	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.23	.19						
BMI Body Mass Index			-.02	.01	-.20	-4.30	.04	.000
FFMQ Observing			.01	.01	.13	2.53	.01	.012
FFMQ Describing			.01	.01	.15	2.85	.02	.005
FFMQ Non-judging			.02	.004	.19	3.55	.03	.000
FFMQ Non-reactivity			.02	.01	.18	3.73	.03	.000
FFMQ Acting with Awareness			.01	.01	.07	1.28	.003	.202

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

Thus, Hypothesis 2 was partially supported. As hypothesized, all five *mindfulness* (FFMQ) facets as a set significantly accounted for shared variance in *intuitive eating* (IES-2). Contrary to Hypothesis 2, the *acting with awareness* facet of mindfulness was not a significant contributor to *intuitive eating* (IES-2).

Research Question 3

Research Question 3 addressed the extent to which unidimensional dispositional *mindfulness* (FFMQ) may contribute to *intuitive eating* (IES-2) over and above the contribution of *body appreciation* (BAS) or the contribution of *adaptive* and *maladaptive emotion regulation strategies* (two total scores), while controlling for *body mass index* (BMI).

Hypothesis 3a. Based on theory and previous research, it was hypothesized that unidimensional dispositional *mindfulness* (FFMQ) will significantly account for the unique variance

in *intuitive eating* (IES-2) over and above the variance accounted by *body appreciation* (BAS), when controlled for *body mass index* (BMI).

Hierarchical regression analysis was performed to test Hypothesis 3a (see Table 7). In the first step, *body mass index* (BMI) was entered to the model as a covariate, significantly accounting for 4 % of the variance in Intuitive Eating [$R^2 = .042$, F (1, 392) = 17.13, $p < .001$]. In the second step, *body appreciation* (BAS) was added to the model, significantly increasing the fit of the model to the data, $\Delta R^2 = .32$, ΔF (1, 391) = 194.45, $p < .001$, and explaining an additional 32 % of the variance in *intuitive eating* (IES-2). R^2 of the model at the second step was significantly greater than zero, F (2, 391) = 110.02, $p < .001$, $R^2 = .36$, accounting for 36% of variance in *intuitive eating* (IES-2).

Table 7

Hierarchical Regression Analysis for the Contribution of Unidimensional Mindfulness Above and Beyond Body Appreciation (N = 394)

Step and Variable	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.36	.32						
BMI Body Mass Index			-.002	.004	-.03	-.60	.001	.552
BAS Body Appreciation			.38	.03	.59	13.95	.32	.000
Step 3	.39	.03						
BMI Body Mass Index			-.01	.004	-.05	-1.17	.002	.245
BAS Body Appreciation			.32	.03	.49	10.41	.17	.000
FFMQ Mindfulness Total			.01	.001	.20	4.47	.03	.000

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

Unidimensional *mindfulnes*s (FFMQ), entered to the model in the third and final step, significantly increased the model R^2, $\Delta R^2 = .03$, ΔF (1, 391) = 20.01, $p < .001$, explaining an additional 3 % of the variance in *intuitive eating* (IES-2) over and above the variance previously explained by *body appreciation* (BAS) and the covariate *body mass index* (BMI). Based on sr^2, unidimensional dispositional *mindfulness* (FFMQ) accounted for 3 % of the unique variance in

intuitive eating in the final model ($t = 4.47$, $\beta = .20$, $sr^2 = .03$, $p < .001$), indicating a small effect size. Based based on sr^2, the effect size of *body appreciation* (BAS) explained the largest amount of the variance (17%) in *intuitive eating* ($t = 10.41$, $\beta = .49$, $sr^2 = .17$, $p < .001$) in the final model (Table 9). Compared to the unique contribution of *body appreciation* (BAS) to *intuitive eating* in the previous step, which was the large in magnitude (32%) based on sr^2 ($t = 13.95$, $\beta = .59$, $sr^2 = .32$, $p < .001$), the unique contribution of *body appreciation* (BAS) in the final step was reduced by 15 %, becoming moderately significant when dispositional *mindfulness* (FFMQ) was added to the model ($t = 10.41$, $\beta = .49$, $sr^2 = .17$, $p < .001$). The full regression model was significantly greater than zero explaining 39 % of variance in *intuitive eating*, $R^2 = .39$, F (3, 390) = 83.58, $p < .001$, suggesting a large effect size for this model. Results affirm that unidimensional dispositional *mindfulness* (FFMQ) significantly contributed to *intuitive eating* over and above *body appreciation* (BAS).

Thus, Hypothesis 3a was fully supported because dispositional *mindfulness* (FFMQ) significantly accounted for a unique proportion of variance in *intuitive eating* (IES-2) over and above the variance accounted by *body appreciation* (BAS), when controlled for *body mass index* (BMI).

Hypothesis 3b. Based on theory and previous research, it was hypothesized that unidimensional dispositional *mindfulness* (FFMQ) will uniquely contribute to *intuitive eating* (IES-2) over and above the contribution of *adaptive and maladaptive emotion regulation strategies* total scores, while controlling for *body mass index* (BMI).

Hierarchical regression analysis regression displayed in Table 8 was conducted to test Hypothesis 3b. In the first step, *body mass index* (BMI) was entered to the model as a covariate accounting for statistically significant 4 % of the variance in Intuitive Eating (IES-2) [$R^2 = .042$, F (1, 392) = 17.13, $p < .001$]. *Adaptive* and *maladaptive emotion regulation strategies* total scores entered the model in the second step, accounted for an additional 13% of the variance in *intuitive eating* (IES-2), $\Delta R^2 = .13$, ΔF (2, 390) = 31.73, $p < .001$, over and above the variance explained by the covariate

body mass index (BMI). The resulting model R^2 was significantly greater than zero, F (3, 390) = 27.76, $p < .001$, $R^2 = .18$, explaining 18% of variance in *intuitive eating* (IES-2).

Table 8

Hierarchical Regression Analysis for the Contribution of Mindfulness to Intuitive Eating Over and Above Adaptive and Maladaptive Emotion Regulation Strategies (N = 394)

Steps and Variables	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.18	.13						
BMI Body Mass Index			-.01	.01	-.15	-3.15	.02	.002
ER Adaptive Strategies			.02	.002	.29	6.29	.08	.000
ER Maladaptive Strategies			-.01	.002	-.23	-4.87	.05	.000
Step 3	.24	.06						
BMI Body Mass Index			-.02	.004	-.17	-3.73	.03	.000
ER Adaptive Strategies			.01	.003	.13	2.38	.01	.018
ER Maladaptive Strategies			-.004	.002	-.10	-1.89	.01	.060
FFMQ Mindfulness Total			.01	.002	.32	5.57	.06	.000

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

In the third step, dispositional unidimensional *mindfulness* (FFMQ) was added to the model, significantly increasing the model R^2, $\Delta R^2 = .06$, ΔF (1, 389) = 30.99, $p < .001$, and explaining 6 % of additional variance in *intuitive eating* (IES-2) over and above the variance explained by *adaptive* and *maladaptive emotion regulation strategies* total scores and *body mass index* (BMI) previously entered to the model. According to sr^2, *adaptive emotion regulation strategies* total score continued to significantly account for a unique portion of variance (1%) in *intuitive eating* (IES-2) in the final model ($t = 2.38$, β = .13, $sr^2 = .01$, $p = .018$), suggesting a small effect size. Based on sr^2, the unique contribution of *adaptive emotion regulation strategies* total score was reduced by 7 % when unidimensional *mindfulness* (FFMQ) was introduced into the model in the third step (Table 11). In the third step, *maladaptive emotion regulation strategies* total score was no longer a significant contributor to the variance in *intuitive eating* (IES-2) ($t = - 1.89$, $\beta = -.10$, $sr^2 = .01$, $p = .06$).

In the final model, dispositional *mindfulness* (FFMQ) was the most significant contributor to *intuitive eating* (IES-2), uniquely accounting for 6% of variance in *intuitive eating* (IES-2) ($t = 5.57$, $\beta = .32$, $sr^2 = .06$, $p < .001$), equal to small effect size. The full regression model was significantly greater than zero explaining 24 % of variance in *intuitive eating* (IES-2), $R^2 = .24$, F (4, 389) = 30.17, $p < .001$. Thus, Hypothesis 3b was fully supported.

Research Question 4

Research Question 4 addressed the extent to which *adaptive* and *maladaptive emotion regulation strategies* (total scores) will contribute to *intuitive eating* (IES-2) over and above the contribution of unidimensional dispositional *mindfulness* (FFMQ) or the contribution *body appreciation* (BAS), while controlling for *body mass index* (BMI).

Hypothesis 4a. Based on theory and previous research, it was hypothesized that *adaptive* and *maladaptive emotion regulation strategies* total scores will account for shared and unique variance in *intuitive eating* (IES-2) over and beyond the variance accounted for by unidimensional dispositional *mindfulness* (FFMQ) while controlling for *body mass index* (BMI).

Hierarchical regression analysis was conducted to test Hypothesis 4a. Results are summarized in Table 9. *Body mass index* (BMI) was a significant contributor to *intuitive eating* (IES-2) in step one [$R^2 = .04$, F (1, 392) = 17.13, $p < .001$]. In the second step, the addition of unidimensional *mindfulness* (FFMQ) accounted for extra 18% of the variance in *intuitive eating* (IES-2), $\Delta R^2 = .18$, ΔF (1, 391) = 90.67, $p < .001$, over and above the variance accounted for by *body mass index* (BMI). R^2 in the second step model was significantly greater than zero, F (2, 391) = 55.86, $p < .001$, $R^2 = .22$. In the third step, *adaptive* and *maladaptive emotion regulation strategies* total scores were added to the model. Addition of total scores of these scales significantly increased the model R^2, $\Delta R^2 = .02$, ΔF (2, 389) = 3.70, $p < .05$, accounting for an additional 2 % of the variance in *intuitive eating* (IES-2) over and above the variance explained by unidimensional *mindfulness* (FFMQ) and the covariate

body mass index (BMI). Unique contribution of *adaptive emotion regulation strategies* total score to *intuitive eating* (IES-2) was statistically significant but small explaining 1 % of unique variance in Intuitive Eating (IES-2) (t = 2.38, β = .13, sr^2 = .01, p < .05). Contribution of *maladaptive emotion regulation strategies* total score to *intuitive eating* (IES-2) was not statistically significant (t = - 1.89, β = - .10, sr^2 = .01, p = .06). Compared to the unique contribution of dispositional *mindfulness* (FFMQ) to *intuitive eating* (IES-2) in the second step (t = 9.52, β = .43, sr^2 = .18, p < .001), its unique contribution to *intuitive eating* (IES-2) was reduced by 12 % when *body appreciation* (BAS) was introduced into the model in the third step (t = 5.57, β = .32, sr^2 = .06, p < .001). Based on sr^2, dispositional *mindfulness* (FFMQ) continued to explain the largest portion of unique variance (6%) in *intuitive eating* (IES-2) in the final model.

Table 9

Hierarchical Regression Analysis for the Contribution of Adaptive and Maladaptive Emotion Regulation Strategies to Intuitive Eating, Over and Beyond Dispositional Mindfulness (N = 394).

Steps and Variables	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.22	.18						
BMI Body Mass Index			-.02	.004	-.19	-4.25	.04	.000
FFMQ Mindfulness Total			.01	.001	.43	9.52	.18	.000
Step 3	.24	.02						
BMI Body Mass Index			-.02	.004	-.17	-3.73	.03	.000
FFMQ Mindfulness Total			.01	.002	.32	5.57	.06	.000
ER Adaptive Strategies Total			.01	.003	.13	2.38	.01	.018
ER Maladaptive Strategies Total			-.004	.002	-.10	-1.89	.01	.060

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

In line with the hypothesis, the full regression model was significantly greater than zero explaining 24 % of variance in *intuitive eating* (IES-2), R^2= .24, F (4, 389) = 30.17, p < .001. Thus, Hypothesis 4a was partially supported because only *adaptive emotion regulation strategies* total score accounted for a significant increment in explained variance in *intuitive eating* (IES-2) over and above

the variance explained by dispositional *mindfulness* (FFMQ).

Hypothesis 4b. Based on theory and previous research, it was hypothesized that *adaptive* and *maladaptive emotion regulation strategies* total scores will account for shared and unique variance in *intuitive eating* (IES-2) over and beyond the variance accounted for by *body appreciation* (BAS), while controlling for *body mass index* (BMI).

Hierarchical regression analysis was conducted to test Hypothesis 4b. Results are summarized in Table 10. In the first step, *body mass index* (BMI) was entered to the model as a covariate accounting for statistically significant 4 % of the variance in *intuitive eating* (IES-2) [R^2 = .042, F (1, 392) = 17.13, p < .001]. In the second step, the addition of *body appreciation* (BAS) accounted for an additional 32% of the variance in *intuitive eating* (IES-2), ΔR^2 = .32, ΔF (1, 391) = 194.45, p < .001, above and beyond the variance accounted for by *body mass index* (BMI). R^2 in the second step of the model was significantly greater than zero, F (2, 391) = 110.02, p < .001, R^2 = .36.

Table 10

Hierarchical Regression Analysis for the Contribution of Adaptive and Maladaptive Emotion Regulation Strategies to Intuitive Eating, Over and Beyond Body Appreciation (N = 394).

Steps and Variables	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.36	.32						
BMI Body Mass Index			-.002	.004	-.03	-.60	.001	.552
BAS Body Appreciation			.38	.03	.59	13.95	.32	.000
Step 3	.39	.03						
BMI Body Mass Index			-.001	.004	-.014	-.32	.0002	.748
BAS Body Appreciation			.34	.03	.53	11.53	.21	.000
ER Adaptive Strategies Total			.01	.002	.10	2.24	.01	.026
ER Maladaptive Strategies Total			-.01	.002	-.14	-3.49	.02	.001

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

In the third step, *adaptive* and *maladaptive emotion regulation strategies* total scores were added to the model. Addition of total scores of these scales significantly increased the model R^2, ΔR^2 = .03, ΔF (2, 389) = 8.11, p < .001, explaining an additional 3 % of the variance in *intuitive eating*

(IES-2) over and above the variance explained by *body appreciation* (BAS) and the covariate *body mass index* (BMI). Unique contributions of *adaptive* and *maladaptive emotion regulation strategies* total scores to *intuitive eating* (IES-2) in the third step were statistically significant but small. Specifically, *adaptive emotion regulation strategies* explained 1 % of unique variance in *intuitive eating* (IES-2) (t = 2.24, β = .10, sr^2 = .01, p < .001), and *maladaptive emotion regulation strategies* explained 2 % of unique variance in *intuitive eating* (IES-2) (t = - 3.49, β = - .14, sr^2 = .02, p < .001). Based on sr^2, *body appreciation* (BAS) continued to explain the largest portion of unique variance (21%) in *intuitive eating* (IES-2) in the final model (t = 11.53, β = .53, sr^2 = .21, p < .001).

In line with Hypothesis 4b, the full regression model was significantly greater than zero explaining 39 % of variance in *intuitive eating* (IES-2), R^2= .39, F (4, 389) = 61.07, p < .001. Thus, Hypothesis 4b was fully supported because the significant increment in explained variance in *intuitive eating* (IES-2) was accounted for by *adaptive* and *maladaptive emotion regulation strategies* total scores over and above the variance explained by *body appreciation* (BAS).

Research Question 5

Research Question 5 addressed the extent to which *body appreciation* (BAS) may contribute to *intuitive eating* (IES-2) over and above the contribution of unidimensional dispositional *mindfulness* (FFMQ) or the contribution of *adaptive* and *maladaptive emotion regulation strategies* total scores, while controlling for *body mass index* (BMI).

Hypothesis 5a. Based on previous research, it was hypothesized that *body appreciation* (BAS) will significantly account for unique and shared variance in *intuitive eating* (IES-2) over and above the variance accounted for by unidimensional dispositional *mindfulness* (FFMQ), while controlling for *body mass index* (BMI).

Hierarchical regression analysis was conducted to test Hypothesis 5a. Results are summarized

in Table 11. *Body mass index* (BMI) was a significant contributor to *intuitive eating* (IES-2) in the first step [$R^2 = .04$, F (1, 392) = 17.13, $p < .001$]. In the second step, the addition of unidimensional *mindfulness* (FFMQ) accounted for an extra 18% of the variance in *intuitive eating* (IES-2), $\Delta R^2 = .18$, ΔF (1, 391) = 90.67, $p < .001$, over and above the variance accounted for by *body mass index* (BMI). The regression model at the second step was significantly greater than zero, F (2, 391) = 55.86, $p < .001$, $R^2 = .22$.

Table 11

Hierarchical Regression Analysis for the Contribution of Body Appreciation to Intuitive Eating, Over and Above Dispositional Mindfulness (N = 394).

Steps and Variables	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.22	.18						
BMI Body Mass Index			-.02	.004	-.19	-4.25	.04	.000
FFMQ Mindfulness Total			.01	.001	.43	9.52	.18	.000
Step 3	.39	.17						
BMI Body Mass Index			-.01	.004	-.05	-1.17	.002	.245
FFMQ Mindfulness Total			.01	.001	.20	4.47	.03	.000
BAS Body Appreciation			.32	.030	.49	10.41	.17	.000

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

Body appreciation (BAS) entered to the model in the third step, significantly increased the model R^2, $\Delta R^2 = .17$, ΔF (1, 390) = 108.35, $p < .001$, explaining an additional 17 % of the variance in *intuitive eating* (IES-2) over and above the variance explained by unidimensional *mindfulness* (FFMQ) and the covariate *body mass index* (BMI). *Body appreciation* (BAS) made a unique and significant contribution to the criterion, accounting for 17 % of unique variance in *intuitive eating* (IES-2) ($t = 10.41$, β = .49, $sr^2 = .17$, $p < .001$). Compared to the unique contribution of dispositional *mindfulness* (FFMQ) to *intuitive eating* (IES-2) in the second step ($t = 9.52$, β = .43, $sr^2 = .18$, $p < .001$) when *body appreciation* (BAS) was introduced into the model in the third step, the unique contribution of dispositional *mindfulness* (FFMQ) to *intuitive eating* (IES-2) ($t = 4.47$, β = .20, $sr^2 =$

.03, $p < .001$) in the third step was reduced by 15 %. Based on sr^2, dispositional *mindfulness* (FFMQ) explained 3% in *intuitive eating* (IES-2) in the final model.

In line with Hypothesis 5a, the full regression model was significantly greater than zero explaining 39% of variance in *intuitive eating* (IES-2), $R^2 = .39$, F (3, 389) = 30.17, p < .001. Thus, Hypothesis 5a was fully supported.

Hypothesis 5b. Based on theory and previous research, it was hypothesized that *body appreciation* (BAS) will uniquely contribute to *intuitive eating* (IES-2) over and above the contribution of *adaptive and maladaptive emotion regulation strategies* total scores, while controlling for *body mass index* (BMI).

Hierarchical regression analysis regression displayed in Table 12 was conducted to test Hypothesis 5b. In the first step, *body mass index* (BMI) was a significant contributor to *intuitive eating* (IES-2) accounting for 4 % of its variance [$R^2 = .042$, F (1, 392) = 17.13, $p < .001$]. *Adaptive* and *maladaptive emotion regulation strategies* total scores entered the model in the second step, accounted for an additional 13% of the variance in *intuitive eating* (IES-2), $\Delta R^2 = .13$, ΔF (2, 390) = 31.73, $p < .001$, over and above the variance explained by the covariate *body mass index* (BMI). The resulting model R^2 was significantly greater than zero, F (3, 390) = 27.76, $p < .001$, $R^2 = .18$, explaining 18% of variance in *intuitive eating* (IES-2). In the third step, *body appreciation* (BAS) was added to the model, significantly increasing the model R^2, $\Delta R^2 = .21$, ΔF (1, 389) = 132.84, $p < .001$, and explaining 21 % of additional variance in *intuitive eating* (IES-2) over and above the variance explained by *adaptive* and *maladaptive emotion regulation strategies* total scores and *body mass index* (BMI) previously entered to the model. Based on sr^2, *adaptive emotion regulation strategies* total score continued to significantly account for a unique portion of variance (1%) in *intuitive eating* (IES-2) in the final model ($t = 2.24$, $\beta = .10$, $sr^2 = .01$, $p = .026$), suggesting a small effect size. Compared to the second step, where *adaptive emotion regulation strategies* total score explained 8 %

of the unique variance in *intuitive eating* (IES-2) ($t = 6.29$, $\beta = .29$, $sr^2 = .08$, $p < .001$), in the third step, when *body appreciation* (BAS) was introduced into the model, the unique contribution of *adaptive emotion regulation strategies* total score was reduced by 7 % (Table 12).

Table 12

Hierarchical Regression Analysis for the Contribution of Body Appreciation to Intuitive Eating Over and Above Adaptive and Maladaptive Emotion Regulation Strategies (N = 394)

Steps and Variables	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.18	.13						
BMI Body Mass Index			-.01	.01	-.15	-3.15	.02	.002
ER Adaptive Strategies			.02	.002	.29	6.29	.08	.000
ER Maladaptive Strategies			-.01	.002	-.23	-4.87	.05	.000
Step 3	.39	.21						
BMI Body Mass Index			-.02	.004	-.01	-.32	.0002	.748
ER Adaptive Strategies			.01	.002	.10	2.24	.01	.026
ER Maladaptive Strategies			-.01	.002	-.14	-3.49	.02	.001
BAS Body Appreciation			.34	.03	.53	11.53	.21	.000

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

Similar to *adaptive emotion regulation* total score, *maladaptive emotion regulation strategies* total score continued to significantly account for a unique portion of the variance (2%) in *intuitive eating* (IES-2) in the final model ($t = -3.49$, $\beta = -.14$, $sr^2 = .02$, $p = .001$), suggesting a small effect size. However, compared to the second step where *maladaptive emotion regulation strategies* total score explained 5 % of the unique variance in *intuitive eating* (IES-2) ($t = -4.87$, $\beta = -.23$, $sr^2 = .05$, $p < .001$), when *body appreciation* (BAS) was added to the model in the third step, the unique contribution of *maladaptive emotion regulation strategies* total score was reduced by 3%, uniquely accounting for 2% of the variance in *intuitive eating* (IES-2) ($t = -3.49$, $\beta = -.14$, $sr^2 = .02$, $p < .001$).

In the final model, *body appreciation* (BAS) was the most significant contributor to *intuitive eating* (IES-2), uniquely accounting for 21% of variance in *intuitive eating* (IES-2) ($t = 11.53$, $\beta = .53$,

sr^2 = .21, p < .001), equal to a medium effect size. The full regression model was significantly greater than zero explaining 39% of the variance in *intuitive eating* (IES-2), R^2= .39, F (4, 389) = 61.07, p < .001. Thus, Hypothesis 5b was fully supported.

Research Question 6

Research Question 6 addressed the extent to which *maladaptive emotion regulation strategies*, *adaptive emotion regulation strategies*, unidimensional dispositional *mindfulness* (FFMQ), and *body appreciation* (BAS) explain *intuitive eating* (IES-2), when they are placed in an order according to their theoretical and empirical importance, while being controlled for *body mass index* (BMI).

Hypothesis 6. It was hypothesized that when the covariate *body mass index* (BMI), *maladaptive emotion regulation strategies*, *adaptive emotion regulation strategies*, unidimensional dispositional *mindfulness* (FFMQ), and *body appreciation* (BAS) would be entered to the regression model in blocks, starting from conceptually and empirically least important and most distal contributors and ending with the most important and the most proximal contributors, the addition of each block would significantly improve the model in its ability to explain *intuitive eating* (IES-2) over and above blocks entered to the model previously. In the final model, *body appreciation* (BAS) and *mindfulness* (FFMQ) will account for significant unique variance in *intuitive eating* (IES-2). Hierarchical model of the factors explaining *intuitive eating* is presented in Figure 1.

Hierarchical multiple regression analysis was employed to test the multidimensional conceptualization of *intuitive eating* (IES-2) (see Table 13). The interrelated but distinct constructs were added to the model in a pre-specified order dictated by the hierarchical relevance of each independent variable to the criterion. In the first step, *body mass index* (BMI) was entered to the model as the most distal covariate, producing a significant change in R^2 accounting for 4% of the variance in *intuitive eating* (IES-2) [R^2 = .04, F (1, 392) = 17.13, p < .001]. In the second step, the

maladaptive emotion regulation strategies total score was added to the model producing a statistically significant change in R^2 accounting for an additional 5% of the variance in *intuitive eating* (IES-2), $\Delta R^2 = .05$, ΔF (1, 391) = 21.75, $p < .001$, equal to small effect size. *Maladaptive emotion regulation* total score uniquely and significantly contributed to the variance in *intuitive eating* (IES-2) ($t = -4.66$, $\beta = -.23$, $sr^2 = .05$, $p < .001$). As a whole, the regression model at the second step was significantly greater than zero [$R^2 = .09$, F (2, 391) = 19.89, $p < .001$], explaining 9% of the variance in *intuitive eating* (IES-2).

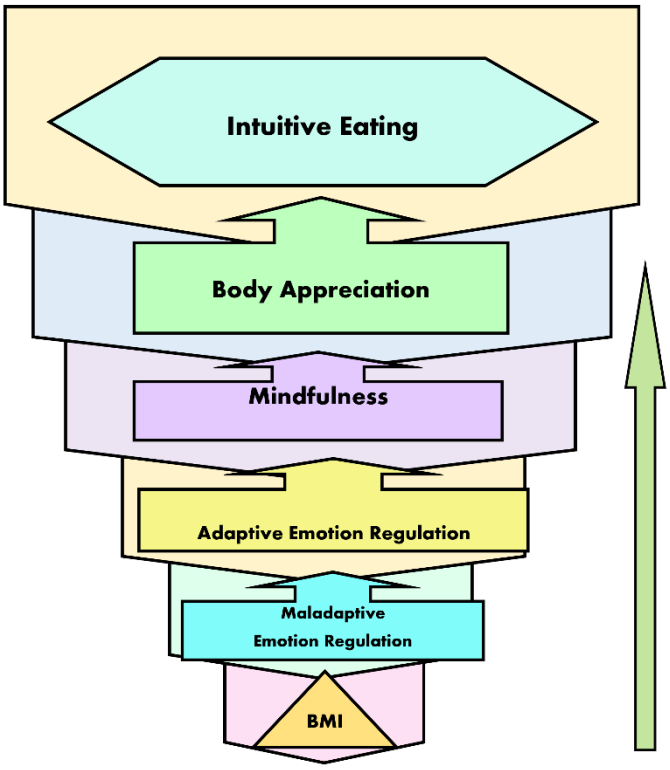


Figure 1. Hierarchical Model of Intuitive Eating. Contributing variables were placed in causal and temporal order guided by theory and empirical research.

In the third step, the *adaptive emotion regulation strategies* total score was entered to the model, significantly adding to the change in R^2 and accounting for an additional 8% of the variance in *intuitive eating* (IES-2), $\Delta R^2 = .08$, ΔF (1, 390) = 39.57, $p < .001$, suggesting a small effect size. As expected, *adaptive emotion regulation strategies* total score uniquely and significantly contributed to

the variance in *intuitive eating* (IES-2) ($t = 6.29$, $\beta = .29$, $sr^2 = .08$, $p < .001$). The whole regression model in this step was significantly greater than zero [$R^2 = .18$, F (3, 390) = 27.76, $p < .001$], explaining 18 % of the variance in *intuitive eating* (IES-2).

Table 13

Hierarchical Regression Analysis Testing a Conceptual Model of Intuitive Eating (N = 394)

Steps and Variables	R^2	ΔR^2	*B*	*SE B*	β	*t*	sr^2	*p*
Step 1	.04	.04						
BMI Body Mass Index			-.02	.01	-.21	-4.14	.04	.000
Step 2	.09	.05						
BMI Body Mass Index			-.02	.01	-.16	-3.36	.03	.001
ER Maladaptive Strategies			-.01	.002	-.23	-4.66	.05	.000
Step 3	.18	.08						
BMI Body Mass Index			-.01	.01	-.15	-3.15	.02	.002
ER Maladaptive Strategies			-.01	.002	-.23	-4.87	.05	.000
ER Adaptive Strategies			.02	.002	.29	6.29	.08	.000
Step 4	.24	.06						
BMI Body Mass Index			-.02	.004	-.17	-3.73	.03	.000
ER Maladaptive Strategies			-.004	.002	-.10	-1.89	.01	.060
ER Adaptive Strategies			.01	.003	.13	2.38	.01	.018
FFMQ Mindfulness Total			.01	.002	.32	5.57	.06	.000
Step 5	.40	.16						
BMI Body Mass Index			-.003	.004	-.03	-.80	.001	.424
ER Maladaptive Strategies			-.004	.002	-.09	-1.97	.01	.050
ER Adaptive Strategies			.002	.002	.04	.75	.001	.453
FFMQ Mindfulness Total			.01	.002	.15	2.75	.01	.006
BAS Body Appreciation			.32	.03	.49	10.17	.16	.000

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

In the fourth step, the unidimensional dispositional *mindfulness* (FFMQ) total score was added to the regression model. Entering the *mindfulness* (FFMQ) total score to the model produced a significant change in $R^2, \Delta R^2 = .06$, ΔF (1, 389) = 30.99, $p < .001$, equal to additional 6% of variance in *intuitive eating* (IES-2) above and beyond the variance accounted for by *body mass index* (BMI), *maladaptive emotion regulation strategies* total score, and *adaptive emotion regulation strategies* total score entered to the model in previous steps, indicating a small effect size. Although the

contribution of *adaptive emotion regulation strategies* total score to *intuitive eating* (IES-2) remained statistically significant in this step (t =2.38, β = .13, sr^2 = .01, p = .018), with a small effect size equal to 1% of the explained variance in *intuitive eating* (IES-2), the contribution of *maladaptive emotion regulation strategies* total score was no longer significant (t = - 1.89, β = - .10, sr^2 = .01, p = .06). However, dispositional *mindfulness* (FFMQ) total score uniquely explained a significant portion of the total variance in *intuitive eating* (IES-2) (t = 5.57, β = .32, sr^2 = .06, p < .001). At this step, the regression model as a whole stayed significant [R^2 = .24, F (4, 389) = 30.17, p < .001], explaining 24 % of the variance in *intuitive eating* (IES-2).

Finally, *body appreciation* (BAS) was added to the model in the last step. The addition of *body appreciation* (BAS) produced a significant change in R^2, ΔR^2 = .16, ΔF (1, 388) = 103.47, p < .001, accounting for an additional 16 % of the explained variance in *intuitive eating* (IES-2), while holding all other variables entered to the model in previous steps constant. In terms of the unique contributions of independent variables important for theoretical conceptualization of *intuitive eating* (IES-2) in the last step, the contribution of *maladaptive emotion regulation strategies* total score to *intuitive eating* (IES-2) was close to significance (t = - 1.97, β = - .09, sr^2 = .001, p = .05). Although *adaptive emotion regulation strategies* no longer significantly and uniquely contributed to the variance in *intuitive eating* (IES-2) (t = .75, β = .04, sr^2 = .001, p = .453), dispositional *mindfulness* (FFMQ) total score uniquely explained a significant portion of the total variance in *intuitive eating* (IES-2) (t = 2.75, β = .15, sr^2 = .01, p = .006).

In the final step, *body appreciation* (BAS) was the strongest contributor to *intuitive eating* (IES-2) (t = 10.17, β = .49, sr^2 = .16, p < .001), explaining 16% of the variance in *intuitive eating* (IES-2), suggesting a medium effect size. The full model was statistically significant, R^2 = .40, F (5, 388) = 51.19, p < .001, explaining 40% of the variance in *intuitive eating* (IES-2), equal to a large effect size. Thus, Hypothesis 6 was fully supported.

Additional Post Hoc Analyses

After primary analyses answering Research Questions 1-6 and testing Hypotheses 1, 2, 3 a-b, 4 a-b, 5 a-b, and 6, the additional post hoc Research Questions 7, 8, 9, and 10 were asked, and Hypotheses 7 a-b, 8, 9, and 10 were proposed. Post-hoc analyses were performed as a follow up of the primary analyses.

Post Hoc Research Question 7

The additional post hoc Research Question 7 addressed the mechanism through which the *acting with awareness* (FFMQ) facet could exert its effect on *intuitive eating* (IES-2). Specifically, Research Question 7 whether the *non-judging* mindfulness facet could play a mediating role in the relationship between the *acting with awareness* (FFMQ) facet and *intuitive eating* (IES-2). This question was caused by the hierarchical regression analysis testing the Hypothesis 2 (Research Question 2), that revealed that in the second step of the hierarchical regression model, the *acting with awareness* (FFMQ) facet did not significantly contribute to the variance in *intuitive eating* ($t = 1.28$, $\beta = .07$, $sr^2 = .003$, $p = .202$). These unexpected results could be explained by multiple regression theory (Pedhazur, 1997), which posits that the introduction of each new independent variable into a multiple regression model creates change in all previous estimates (e.g., regression coefficients, standard errors, significance test values, and p-values) associated with independent variables which were entered to the model previously.

Thus, the lack of expected significant relationship between *acting with awareness* (FFMQ) and *intuitive eating* (IES-2) in the present study could be explained by the presence of another *mindfulness* (FFMQ) facet (e.g., the *non-judging* facet) which was influencing the strength of this relationship (Baron & Kenny, 1986; MacKinnon et al., 2000, 2007; Hayes, 2009, 2013). According to the mediation statistical theory, if the *non-judging* mindfulness facet was the mediator of the relationship between the *acting with awareness* facet and *intuitive eating* (IES-2), it could create a

"statistical adjustment" (MacKinnon et al., 2000, p. 174) which was reducing the magnitude of the relationship between the *acting with awareness* facet and *intuitive eating* (IES-2). As a mediator, the *non-judging* facet could explain part or all of this relationship because it was in the causal path between the *acting with awareness* facet and *intuitive eating* (IES-2).

Moreover, based on the theoretical models of mindfulness (Bishop et al., 2004; Malinowski, 2013; Shapiro et al., 2006) claiming that an open, non-judgmental, and accepting orientation to experience is an integrated part of the mindfulness process and a consequence of initial self-regulation of attention elicited through awareness to immediate experience, the *non-judging* quality of mindfulness could be an important mechanism through which the *acting with awareness* quality had been linked to improved mental health (Bishop et al., 2004; Vujanovic et al., 2010) and eating behaviors specifically (Park et al., 2011, 2012). Therefore, it seemed important to test if the relationship between the *acting with awareness* (FFMQ) facet and *intuitive eating* (IES-2) could be influenced by the presence of the *non-judging* mindfulness facet (FFMQ).

Hypothesis 7a. It was hypothesized that when only four mindfulness facets (*observing, describing, non-reactivity,* and *acting with awareness*) would be entered to the regression model at the second step (after controlling for BMI), the a*cting with awareness* facet would account for a unique significant portion of variance in *intuitive eating* (IES-2) over and above the contribution of *body mass index* (BMI).

Hierarchical regression displayed in Table 14 was used to test Hypothesis 7a. When only four *mindfulness* (FFMQ) facets (*observing, describing, non-reactivity,* and *acting with awareness*) were entered to the model in step two, R^2 of the model significantly increased, $\Delta R^2 = .17$, ΔF (4, 388) = 20.20, $p < .001$, explaining 17% of the variance in *intuitive eating* (IES-2) over and above the variance explained by *body mass index* (BMI). The resulting full model accounted for 21 % of variance in *intuitive eating* (IES-2) and was significantly greater than zero, $R^2 = .21$, F (5, 388) =

20.26, p < .001.

As hypothesized, in the absence of the *non-judging* (FFMQ) mindfulness facet in the model, the *acting with awareness* (FFMQ) facet significantly accounted for a unique variance in *intuitive eating* (t = 3.05, β = .15, sr^2 = .02, p = .002), suggesting possible causal mediation inferences (MacKinnon et al., 2000, 2007; Hayes, 2009, 2013). However, the *observing* mindfulness (FFMQ) facet became insignificant (t =1.83, β = .09, sr^2 = .01, p = .068), indicating that when all five *mindfulness* (FFMQ) facets were in the model, the *non-judging* (FFMQ) facet played the role of a suppressor variable, increasing the predictive validity of the *observing* (FFMQ) facet by suppressing its irrelevant variance (Lutz, 1983; MacKinnon et al., 2000).

Table 14

Hierarchical Regression Analysis for Contribution of Mindfulness Facets to Intuitive Eating with and without the Non-Judging Mindfulness Facet (N = 394).

Model	R^2	ΔR^2	*B*	*SE B*	*β*	*t*	sr^2	*p*.
Step 1	.04	.04						
Body Mass Index			-.02	.005	-.21	-4.14	.042	.000
Step 2	.23	.19						
Body Mass Index			-.02	.005	-.20	-4.30	.04	.000
FFMQ Observing			.01	.005	.13	2.53	.01	.012
FFMQ Describing			.01	.005	.15	2.85	.02	.005
FFMQ Non-judging			.02	.004	.19	3.55	.03	.000
FFMQ Non-reactivity			.02	.006	.18	3.73	.03	.000
FFMQ Acting with Awareness			.01	.005	.07	1.28	.003	.202
Step 2 (without FFMQ Non-judging)	.21	.17						
Body Mass Index			-.02	.005	-.22	-4.87	.05	.000
FFMQ Observing			.01	.005	.09	1.83	.01	.068
FFMQ Describing			.02	.005	.18	3.43	.02	.001
FFMQ Non-reactivity			.03	.006	.20	4.06	.03	.000
FFMQ Acting with Awareness			.01	.004	.15	3.05	.02	.002

Note. Intuitive eating (IES-2) is a dependent variable. Body mass index (BMI) is a covariate.
*p < .05; **p < .01, ***p < .001

There was no reason to provide a theoretical explanation and testing of the suppression effects in the present study (Voyer, 1996), mainly because in explanatory hierarchical regressions

based on theory, the mechanism underlying suppression is statistical with no causal links producing the suppressor effects (Ludlow & Klein, 2014). Overall, Hypothesis 7a was fully supported.

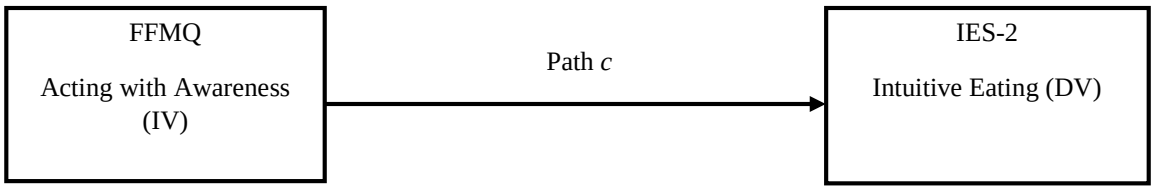
Hypothesis 7b. Based on theoretical models of mindfulness (Bishop et al., 2004; Malinowski, 2013; Shapiro et al., 2006), it was hypothesized that the *non-judging* mindfulness (FFMQ) facet will mediate the relationship between the *acting with awareness* mindfulness (FFMQ) facet and *intuitive eating* (IES-2). In other words, it was expected that the *non-judging* (FFMQ) mindfulness facet would function as the conduit through which the causal effect of the *acting with awareness* mindfulness (FFMQ) facet is transmitted to on *intuitive eating* (IES-2). The indirect effect of the *acting with awareness* mindfulness (FFMQ) on *intuitive eating* (IES-2) was expected to be significant.

A simple bootstrapping mediation analysis (Hayes, 2013; Preacher & Hayes, 2004) was conducted to test the unique direct and indirect associations posited in the hypothesized mediation relationship linking the a*cting with awareness* (FFMQ) facet and *intuitive eating* (IES-2) through the mediating role of the *non-judging* (FFMQ) facet outlined in Hypothesis 7b (Figure 2, Panels A and B, and Table 15). Mediation analysis allowed to explore processes and mechanisms moving from "merely descriptive to more functional understanding of the relationships among variables" (Preacher & Hayes, 2004, p. 720).

Results of the analysis revealed that *acting with awareness* (FFMQ) facet significantly and positively contributed to *non-judging* (FFMQ) facet ($B = .56$, $t = 11.34$, $p < .001$), and the *non-judging* (FFMQ) facet significantly and positively contributed to *intuitive eating* (IES-2) while controlling for *acting with awareness* (FFMQ) facet ($B = .02$, $t = 4.39$, $p < .001$). A bootstrap confidence interval for the indirect effect of FFMQ *acting with awareness* on *intuitive eating* (IES-2) (*ab*) did not include zero ($B = .01$, BCa CI [.006, .017]), providing evidence that the indirect effect (*ab*) of the *acting with awareness* (FFMQ) mindfulness facet on *intuitive eating* (IES-2) through the

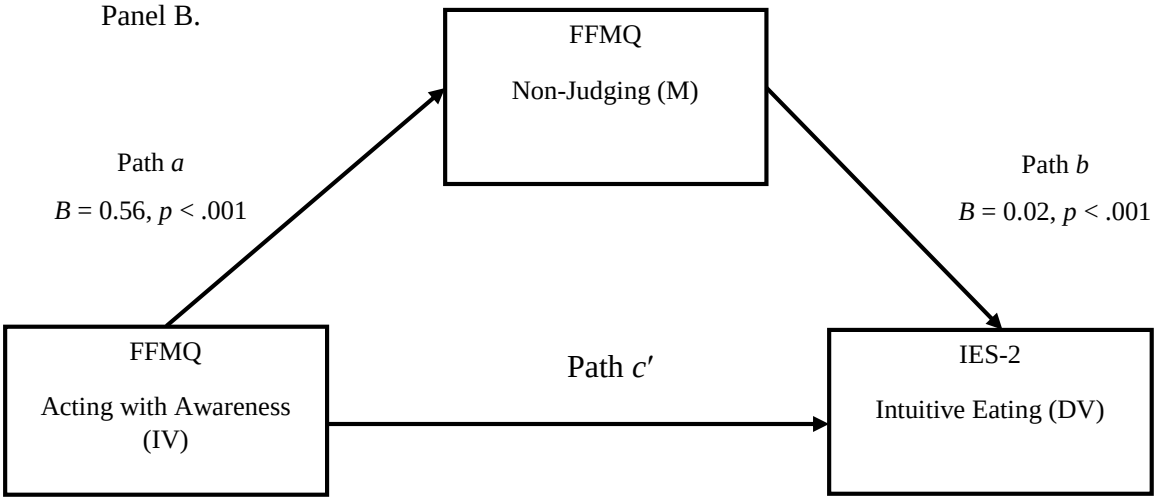
non-judging (FFMQ) mindfulness facet was significant.

Panel A.



Path $c = c' + ab$ (total effect), $B = .02$, $p < .001$

Panel B.



Path $c' = c—ab$ (direct effect), $B = .01$, $p = .014$

Path ab = $c - c'$ (indirect effect), $B = .01$, BCa CI [.006, .017], $k^2 = .11$

Figure 2 (Panels A and B). Mediation model of the *acting with awareness* FFMQ mindfulness facet exerting an effect on *intuitive eating* (IES-2) directly and indirectly through the FFMQ *non-judging* mindfulness facet in path diagram form (Hayes, 2013). IV = FFMQ *acting with awareness*; M = FFMQ *non-judging*; DV = *intuitive eating* (IES-2); *B* = unstandardized coefficient; BCa CI = 95% Confidence Interval (CI) for *ab* (indirect effect). Panel A: *total effect* (*c*) of IV on DV is equal to the sum of the direct (*c'*) and indirect effects (*ab*). Panel B: *direct effect* ($c' = c—ab$) of IV on DV independent of its effect on M; *indirect effect* (*ab)* of IV on DV transmitted through M, which is the product of *a* and *b*, or the difference between the total (*c*) and the direct effect (*c'*).

The size of the indirect effect may be labeled as lying in the medium range, $k^2 = .11$, 95%

BCa CI [.057, .166] (small = 0.01, medium = 0.09 and large = 0.25; Preacher & Kelley, 2011). In other words, the indirect effect of the *acting with awareness* mindfulness (FFMQ) facet on *intuitive eating* (IES-2) through the *non-judging* mindfulness (FFMQ) facet was around 11% of its maximum possible value. Additionally, as shown in Table 15, the conservative Sobel test of mediation (Sobel, 1982, 1986) indicated a significant indirect effect, suggesting that *non-judging* of inner experiences (FFMQ) significantly accounted for the relationship between the *acting with awareness* mindfulness (FFMQ) facet and *intuitive eating* (IES-2) ($Z = 4.08$, $p < .001$). Thus, Hypothesis 7b was fully supported.

Table 15

Summary of Mediation Analysis for the Relationship of Acting with Awareness Mindfulness Facet to Intuitive Eating through the Non-Judging Mindfulness facet (N = 394)

Model	Estimate	*SE*	*t*	*p*	CI lower	CI-upper
Model without mediator						
IV → DV (*c*)	.02	.004	5.24	< .001	.014	.031
$R^2_{Y,X}$	.07			< .001		
Model with mediator						
IV → M (*a*)	.56	.05	11.34	< .001	.466	.661
$R^2_{M,X}$	.25			< .001		
M → DV (*b*)	.02	.004	4.39	< .001	.010	.027
IV → DV (*c*')	.01	.01	2.47	.014	.003	.022
$R^2_{Y,MX}$	.11			< .001		
Indirect Effect						
ab	.01	.003			.006	.017
k^2	.11	.03			.057	.166
Sobel's test	.01	.003	$Z = 4.08$	< .001		

Note. Table adapted from Preacher & Kelley (2011). Regression coefficients *a*, *b*, *c*, and *c'* are illustrated in Figure 2. FFMQ *acting with awareness* is the independent variable (IV), FFMQ *non-judging* is the mediator (M), and IES-2 *intuitive eating* is the outcome (DV). The 95% Confidence Interval (CI) for *ab* (indirect effect) is obtained by the bias-corrected bootstrap with 5,000 resamples. Estimate = model coefficients, direct, indirect, and total effects were reported in unstandardized form; CI lower = bias corrected lower bound of a 95% confidence interval; CI upper = bias corrected upper bound; → = affects; $R^2_{Y,X}$ = proportion of variance in DV explained by IV; $R^2_{M,X}$ = proportion of variance in M explained by IV; and $R^2_{Y,MX}$ = proportion of variance in DV explained by M & IV; k^2 = Kappa-squared is a measure of Indirect Effect (*ab*) size; Cohen's (1988) guidelines for small, medium, and large effect sizes as .01, .09, and .25 (pp. 79–81) were used to estimate the magnitude of k^2 (Hayes,2013).

Additionally, results of the mediation analysis indicated that the *acting with awareness* (FFMQ) facet had a significant direct effect (*c′*) on *intuitive eating* (IES-2) independent of its effect on the *non-judging* mindfulness (FFMQ) facet (*B*= .01, $t = 2.47$, $p = .014$), meaning that even without refraining from an evaluation of thoughts and feelings, focusing attention on one's current activities in everyday life situations was a positive factor which was helping participants to eat more intuitively.

Post Hoc Research Question 8

The post hoc Research Question 8 asked if *body appreciation* (BAS) could play a mediating role in the relationship between dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2). This question was asked after the results of the hierarchical regression analysis testing Hypothesis 5a (Research Question 5), suggesting that *body appreciation* (BAS) could be a mediator of the relationship between *mindfulness* (FFMQ) and *intuitive eating* (IES-2), due to a reduced association between unidimensional *mindfulness* (FFMQ) and *intuitive eat*ing (IES-2) when *body appreciation* (BAS) was added to the model in the third step (MacKinnon et al., 2000, 2007; Hayes, 2009, 2013).

Hypothesis 8. It was hypothesized that unidimensional dispositional *mindfulness* (FFMQ) will exert its effect on *intuitive eating* (IES-2) through *body appreciation* (BAS), the mediator of the relationship between unidimensional dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2). The indirect effect of unidimensional *mindfulness* (FFMQ) on *intuitive rating* (IES-2) through *body appreciation* (BAS) was expected to be significant.

A simple bootstrapping mediation analysis (Hayes, 2013; Preacher & Hayes, 2004) was conducted to test the unique direct and indirect effect of dispositional *mindfulness* (FFMQ) on *intuitive eating* (IES-2) through the *body appreciation* (BAS). Results of the analysis are displayed in Figure 3 (Panels A and B) and Table 16. Mediation analysis revealed that *mindfulness* (FFMQ) significantly and positively contributed to *body appreciation* (BAS) (*B* = .01, $t = 9.48$, $p < .001$), and *body appreciation* (BAS) significantly and positively contributed to *intuitive eating* (IES-2), while

controlling for unidimensional dispositional *mindfulness* (FFMQ) (B = .33, t = 11.40, p < .001).

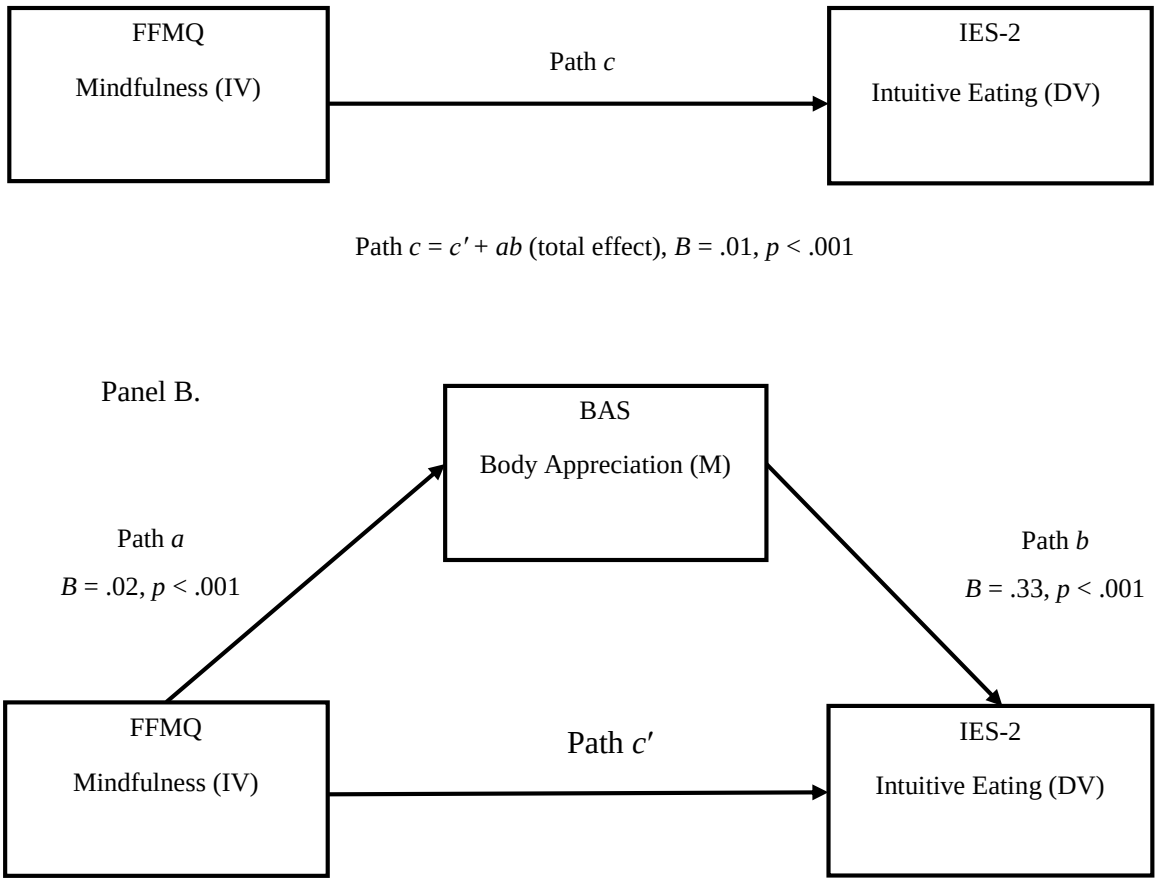


Figure 3(Panels A and B). Mediation model of *mindfulness* (FFMQ) exerting an effect on *intuitive eating* (IES-2) directly and indirectly through *body appreciation* (BAS) in path diagram form (Hayes, 2013). IV = *mindfulness* (FFMQ); M = *body appreciation* (BAS); DV = *intuitive eating* (IES-2); *B* = unstandardized coefficient; BCa CI = 95% Confidence Interval (CI) for *ab* (indirect effect). Panel A: *total effect* (*c*) of IV on DV is equal to the sum of the direct (*c′*) and indirect effects (*ab*). Panel B: *direct effect* (*c′ = c—ab*) of IV on DV independent of its effect on M; *indirect effect* (*ab)* of IV on DV transmitted through M, which is the product of *a* and *b*, or the difference between the total (*c*) and the direct effect (*c′*).

Results of the analysis indicated that the bootstrap confidence interval for the indirect effect of dispositional *mindfulness* (FFMQ) on *intuitive eating* (IES-2) through *body appreciation* (BAS)

(*ab*) did not include zero (*B* = .01, BCa CI [.006, .009]), suggesting a significant indirect effect. That is, a higher level of dispositional *mindfulness* predicted increased *body appreciation* (BAS), which in turn predicted increased *intuitive eating* (IES-2). The indirect effect (*ab*) of *mindfulness* (FFMQ) ranging from medium to large, k^2 = .24, 95% BCa CI [.187, .290] (Preacher & Kelley, 2011), explained 24% of the maximum possible indirect effect that could have been obtained, given the scales of the variables used in this study.

Table 16

Summary of Mediation Analysis for the relationship of Mindfulness to Intuitive Eating through Body Appreciation (N = 394)

Model	Estimate	*SE*	*t*	*p*	CI lower	CI-upper
Model without mediator						
IV → DV (*c*)	.01	.001	9.48	< .001	.011	.016
$R^2_{Y,X}$	.19			< .001		
Model with mediator						
IV → M (*a*)	.02	.002	10.42	< .001	.018	.027
$R^2_{M,X}$	.22			< .001		
M → DV (*b*)	.33	.029	11.40	< .001	.272	.385
IV → DV (*c'*)	.01	.001	4.36	< .001	.003	.009
$R^2_{Y,MX}$	.39			< .001		
Indirect Effect						
ab	.01	.001			.006	.009
k^2	.24	.027			.187	.290
Sobel's test	.01	.001	Z = 7.67	< .001		

Note. Table adapted from Preacher & Kelley (2011). Regression coefficients *a*, *b*, *c*, and *c'* are illustrated in Figure 3. *Mindfulness* (FFMQ) is the independent variable (IV), *body appreciation* (BAS) is the mediator (M), and *intuitive eating* (IES-2) is the outcome (DV). The 95% Confidence Interval (CI) for *ab* (indirect effect) is obtained by the bias-corrected bootstrap with 5,000 resamples. *B* is the unstandardized coefficient; CI lower = bias corrected lower bound of a 95% confidence interval; CI upper = bias corrected upper bound; → = affects; $R^2_{Y,X}$ = proportion of variance in DV explained by IV; $R^2_{M,X}$ = proportion of variance in M explained by IV; and $R^2_{Y,MX}$ = proportion of variance in DV explained by M & IV; k^2 = Kappa-squared is a measure of Indirect Effect (*ab*) size; Cohen's (1988) guidelines for small, medium, and large effect sizes as .01, .09, and .25 (pp. 79–81) were used to estimate the magnitude of k^2 (Hayes,2013).

Moreover, as shown in Table 16, results of the Sobel's test (Sobel, 1982, 1986) indicated a significant indirect effect, suggesting that *body appreciation* (BAS) significantly explained the relationship between unidimensional dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2)

($Z = 7.67$, $p < .001$). Thus, Hypothesis 8 was fully supported.

Finally, dispositional *mindfulness* (FFMQ) had a significant direct effect (*c′*) on *intuitive eating* (IES-2), independent of its effect on *body appreciation* (BAS) (*B*= .01, $t = 4.36$, $p < .001$), meaning that regardless participants' ability to appreciate their bodies, being mindful in everyday life situations was helping them to eat more intuitively.

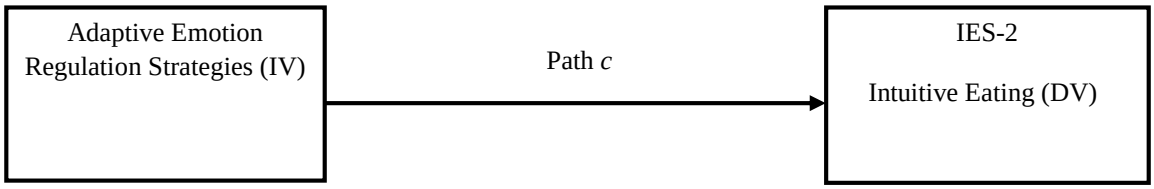
Post Hoc Research Question 9

Post hoc Research Question 9 asked whether the relationship between *adaptive emotion regulation strategies* total score and *intuitive eating* (IES-2) was mediated by *body appreciation* (BAS). This question arose after the results of the hierarchical regression analysis testing Hypothesis 5b (Research Question 5), suggesting that due to a reduced association between *adaptive emotion regulation strategies* total score and *intuitive eati*ng (IES-2) when *body appreciation* (BAS) was added to the model in the third step (MacKinnon et al., 2000, 2007; Hayes, 2009, 2013), *body appreciation* (BAS) could be a mediator of the relationship between *adaptive emotion regulation strategies* total score and *intuitive eating* (IES-2),

Hypothesis 9. It was hypothesized that *adaptive emotion regulation strategies* total score will exert its effect on *intuitive eating* (IES-2) through *body appreciation* (BAS), the mediator of the relationship between *adaptive emotion regulation strategies* and *intuitive eating* (IES-2). The indirect effect of *adaptive emotion regulation strategies* total score on *intuitive rating* (IES-2) through *body appreciation* (BAS) was expected to be significant.

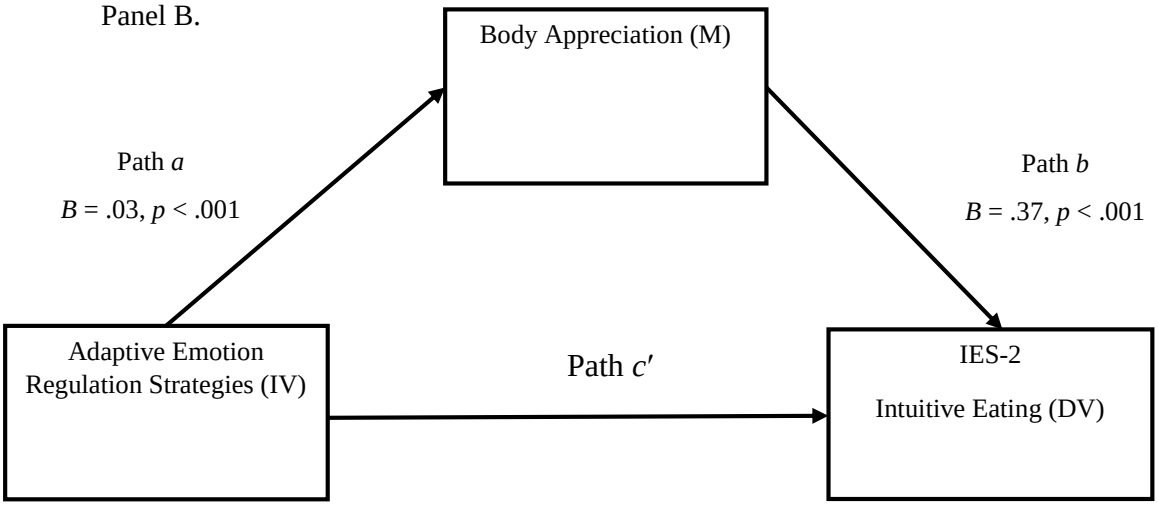
A simple bootstrapping mediation analysis (Hayes, 2013; Preacher & Hayes, 2004) was conducted to test the unique direct and indirect associations existing in the hypothesized mediation model linking *adaptive emotion regulation strategies* and *intuitive eating* (IES-2) through the mediating role of *body appreciation* (BAS) (Figure 4 (Panels A and B) and Table 17).

Panel A.



Path $c = c' + ab$ (total effect), $B = .02$, $p < .001$

Panel B.



Path $c' = c—ab$ (direct effect), $B = .004$, $p = .053$

Path ab = $c - c'$ (indirect effect), $B = .01$, BCa CI [.008, .014], $k^2 = .22$

Figure 4 (Panels A and B). Mediation model of *adaptive emotion regulation strategies* exerting an effect on *intuitive eating* (IES-2) directly and indirectly through *body appreciation* (BAS) in path diagram form (Hayes, 2013). IV = *adaptive emotion regulation strategies*; M = *body appreciation* (BAS); DV = *intuitive eating* (IES-2); *B* = unstandardized coefficient; BCa CI = 95% Confidence Interval (CI) for *ab* (indirect effect). Panel A: *total effect* (*c*) of IV on DV is equal to the sum of the direct (*c′*) and indirect effects (*ab*). Panel B: *direct effect* ($c' = c—ab$) of IV on DV independent of its effect on M; *indirect effect* (*ab)* of IV on DV transmitted through M, which is the product of *a* and *b,* or the difference between the total (*c*) and the direct effect (*c′*).

Mediation analysis revealed that *adaptive emotion regulation strategies* significantly and positively contributed to *body appreciation* (BAS) ($B = .03$, $t = 8.19$, $p < .001$), and *body appreciation* (BAS) significantly and positively contributed to *intuitive eating* (IES-2), while

controlling for *adaptive emotion regulation strategies* (B = .37, t = 13.01, p < .001). A bootstrap confidence interval for the indirect effect (*ab*) of *adaptive emotion regulation strategies* on *intuitive eating* (IES-2) through *body appreciation* (BAS) did not cross zero (B = .01, BCa CI [.008, .014]), suggesting that the indirect effect (*ab*) of *adaptive emotion regulation strategies* was statistically significant. That is, a higher level of *adaptive emotion regulation* predicted increased *body appreciation* (BAS), which in turn predicted increased *intuitive eating* (IES-2).

Table 17

Summary of Mediation Analysis for the relationship of Adaptive Emotion Regulation Strategies to Intuitive Eating through Body Appreciation (N = 394)

Model	Estimate	*SE*	*t*	*p*	CI lower	CI-upper
Model without mediator						
IV → DV (*c*)	.02	.002	6.26	< .001	.010	.020
$R^2_{Y,X}$	.09			< .001		
Model with mediator						
IV → M (*a*)	.03	.003	8.19	< .001	.023	.037
$R^2_{M,X}$	.15			< .001		
M → DV (*b*)	.37	.028	13.01	< .001	.311	.422
IV → DV (*c*')	.004	.002	1.94	.053	-.0001	.009
$R^2_{Y,MX}$	.37			< .001		
Indirect Effect						
ab	.01	.002			.008	.014
k^2	.22	.027			.171	.278
Sobel's test	.01	.002	Z = 6.92	< .001		

Note. Table adapted from Preacher & Kelley (2011). Regression coefficients *a*, *b*, *c*, and *c'* are illustrated in Figure 4. *Adaptive emotion regulation strategies* total score is the independent variable (IV), *body appreciation (BAS)* is the mediator (M), and *intuitive eating* (IES-2) is the outcome (DV). The 95% Confidence Interval (CI) for *ab* (indirect effect) is obtained by the bias-corrected bootstrap with 5,000 resamples. B is the unstandardized coefficient; CI lower = bias corrected lower bound of a 95% confidence interval; CI upper = bias corrected upper bound; → = affects; $R^2_{Y,X}$ = proportion of variance in DV explained by IV; $R^2_{M,X}$ = proportion of variance in M explained by IV; and $R^2_{Y,MX}$ = proportion of variance in DV explained by M & IV; k^2 = Kappa-squared is a measure of Indirect Effect (*ab*) size; Cohen's (1988) guidelines for small, medium, and large effect sizes as .01, .09, and .25 (pp. 79–81) were used to estimate the magnitude of k^2 (Hayes, 2013).

The indirect effect (*ab*) of *adaptive emotion regulation strategies* on *intuitive eating* (IES-2) through *body appreciatio*n (BAS) was interpreted as ranging from medium to large, k^2 = .22, 95% BCa CI [.171, .278] (Preacher & Kelley, 2011), explaining 22% of the maximum possible indirect

effect that could have been obtained, given the scales of the variables involved in this study. Additionally, as shown in Table 17, Sobel's test (Sobel, 1982, 1986) for the indirect effect found that *adaptive emotion regulation strategies* total score had a significant indirect effect on *intuitive eating* (IES-2) ($Z = 6.92$, $p < .001$) through *body appreciation* (BAS). Thus, Hypothesis 9 was fully supported, because the mediating role of *body appreciation* (BAS) in the relationship between *adaptive emotion regulation strategies* and *intuitive eating* (IES-2) was confirmed by the data.

Mediation analysis was also used to examine the direct effect of *adaptive emotion regulation strategies* total score on *intuitive eating* (IES-2). Interestingly, no evidence was found for the direct effect (c') of *adaptive emotion regulation strategies* on *intuitive eating* (IES-2) independent of its effect on *body appreciation* (BAS) ($B = .004$, $t = 1.94$, $p = .053$), suggesting that habitual use of *adaptive emotion regulation strategies* exerted its hypothesized influence on *intuitive eating* (IES-2) exclusively through *body appreciation* (BAS). The absence of a significant direct effect indicated that habitual use of *adaptive emotion regulation* strategies did not help college women to eat more intuitively unless they employed *adaptive emotion regulation strategies* to enhance their *body appreciation* (BAS).

Post Hoc Research Question 10

Post hoc Research Question 10 asked whether *body appreciation* (BAS) could play a mediating role in the relationship between *maladaptive emotion regulation strategies* total score and *intuitive eating* (IES-2). Similar to the post hoc Research Question 9, this question arose after the results of the hierarchical regression analysis testing Hypothesis 5b (Research Question 5), suggesting that *body appreciation* (BAS) could be a mediator of the relationship between *maladaptive emotion regulation strategies* total score and *intuitive eating* (IES-2), due to a reduced association between *maladaptive emotion regulation strategies* total score and *intuitive eat*ing (IES-2) when *body appreciation* (BAS) was added to the model in the third step (MacKinnon et al., 2000, 2007; Hayes,

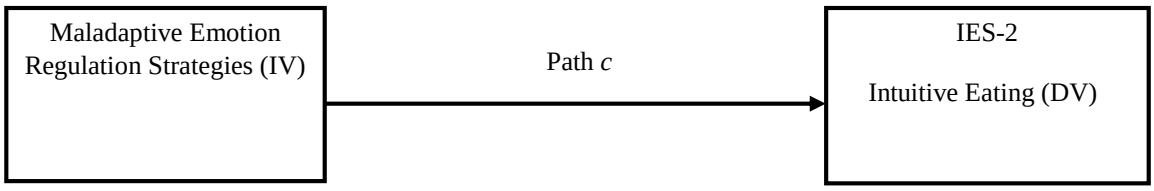
2009, 2013).

Hypothesis 10. It was hypothesized that *maladaptive emotion regulation strategies* total score will exert its effect on *intuitive eating* (IES-2) through the mediating role of *body appreciation* (BAS). The indirect effect of *maladaptive emotion regulation strategies* on *intuitive rating* (IES-2) through *body appreciation* (BAS) was expected to be significant.

A simple bootstrapping mediation analysis (Hayes, 2013; Preacher & Hayes, 2004) was conducted to test the unique direct and indirect associations existing in the hypothesized mediation model linking *maladaptive emotion regulation strategies* and *intuitive eating* (IES-2) through the mediating role of *body appreciation* (BAS). Results of the analysis are presented in Figure 5 (Panels A and B) and Table 18. Simple mediation analysis revealed that *maladaptive emotion regulation strategies* significantly and negatively contributed to *body appreciation* (BAS) (B = - .01, t = - 4.22, p < .001), and *body appreciation* (BAS) significantly and positively contributed to *intuitive eating* (IES-2) while controlling for *maladaptive emotion regulation strategies* (B = .37, t = 13.99, p < .001). A bootstrap confidence interval for the indirect effect (*ab*) of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) through *body appreciation* (BAS) did not cross zero (B = - .01, BCa CI [- .008, - .003]), suggesting that the indirect effect (*ab*) of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) was statistically significant. That is, a higher level of *maladaptive emotion regulation* predicted decreased *body appreciation* (BAS), which in turn predicted decreased *intuitive eating* (IES-2). The medium indirect effect (*ab*) of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) through *body appreciatio*n (BAS), k^2=.13, 95% BCa CI [.068, .191] (Preacher & Kelley, 2011) explained 13% of the maximum possible indirect effect that could have occurred. According to the Sobel's test (Sobel, 1982, 1986) value (Z = - 4.03, p < .001), *body appreciation* (BAS) significantly mediated the relationship between *maladaptive emotion regulation strategies* and *intuitive eating* (IES-2) (Table 18). Thus, Hypothesis 10 about the indirect effect of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) through *body*

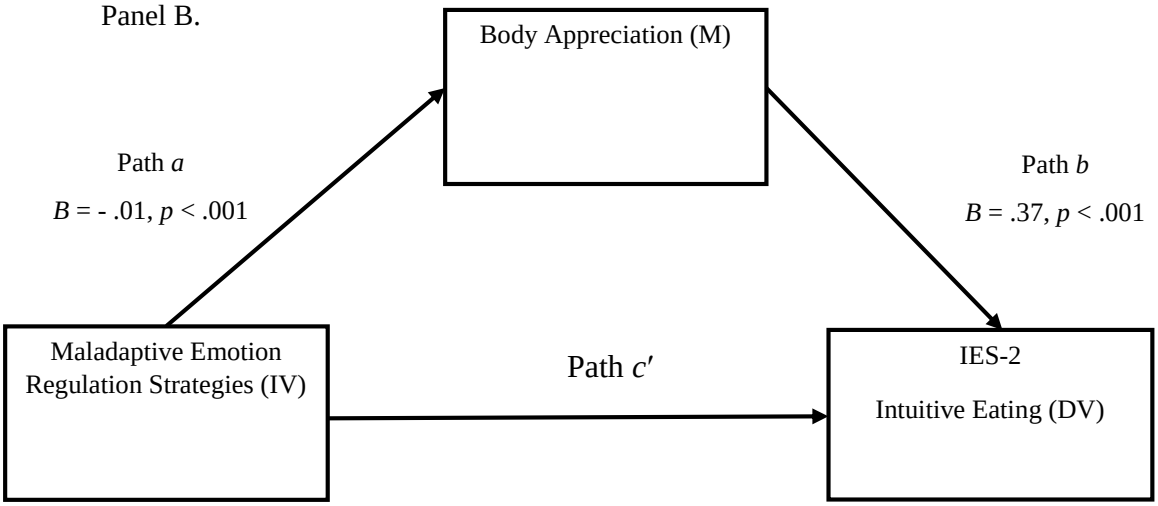
appreciation (BAS) was fully supported.

Panel A.



Path *c* = *c′* + *ab* (total effect), *B* = - .01, *p* < .001

Panel B.



Path c′ = *c*—*ab* (direct effect), *B* = - .006, *p* < .001

Path ab = *c* – *c′* (indirect effect), *B* = .01, BCa CI [.008, .014], k^2 = .22

Figure 5 (Panels A and B). Mediation model of *maladaptive emotion regulation strategies* exerting an effect on *intuitive eating* (IES-2) directly and indirectly through *body appreciation* (BAS) in path diagram form (Hayes, 2013). IV = *maladaptive emotion regulation strategies*; M = *body appreciation* (BAS); DV = *intuitive eating* (IES-2); *B* = unstandardized coefficient; BCa CI = 95% Confidence Interval (CI) for *ab* (indirect effect). Panel A: *total effect* (*c*) of IV on DV is equal to the sum of the direct (*c′*) and indirect effects (*ab*). Panel B: *direct effect* (*c′* = *c*—*ab*) of IV on DV independent of its effect on M; *indirect effect* (*ab)* of IV on DV transmitted through M, which is the product of *a* and *b*, or the difference between the total (*c*) and the direct effect (*c′*).

Compared to the lack of a significant direct effect of *adaptive emotion regulation strategies*

on *intuitive eating* (IES-2), habitual use of *maladaptive emotion regulation strategies* had a significant direct effect (*c'*) on *intuitive eating* (IES-2) independent of its effect on *body appreciation* (BAS) (*B*= - .006, *t* = - 3.39, *p* < .001), suggesting that increased use of *maladaptive emotion regulation strategies* was hindering participants' *intuitive eating* (IES-2) regardless of their ability to appreciate their bodies.

Table 18

Summary of Mediation Analysis for the relationship of Maladaptive Emotion Regulation Strategies to Intuitive Eating through Body Appreciation (N = 394)

Model	Estimate	*SE*	*t*	*p*	CI lower	CI-upper
Model without mediator						
IV → DV (*c*)	- .01	.002	- 5.27	< .001	- .015	- .007
$R^2_{Y,X}$	.07			< .001		
Model with mediator						
IV → M (*a*)	- .01	.003	- 4.22	< .001	- .020	- .007
$R^2_{M,X}$	.05			< .001		
M → DV (*b*)	.37	.026	13.99	< .001	.317	.420
IV → DV (*c*')	- .006	.002	- 3.39	< .001	-.009	- .002
$R^2_{Y,MX}$	.38			< .001		
Indirect Effect						
ab	- .01	.001			- .008	- .003
k^2	.13	.031			.068	.191
Sobel's test	- .01	.001	*Z* = - 4.03	< .001		

Note. Table adapted from Preacher & Kelley (2011). Regression coefficients *a*, *b*, *c*, and *c'* are illustrated in Figure 5. *Maladaptive emotion regulation strategies* total score is the independent variable (IV), *body appreciation (BAS)* is the mediator (M), and *intuitive eating* (IES-2) is the outcome (DV). The 95% Confidence Interval (CI) for *ab* (indirect effect) is obtained by the bias-corrected bootstrap with 5,000 resamples. *B* is the unstandardized coefficient; CI lower = bias corrected lower bound of a 95% confidence interval; CI upper = bias corrected upper bound; → = affects; $R^2_{Y,X}$ = proportion of variance in DV explained by IV; $R^2_{M,X}$ = proportion of variance in M explained by IV; and $R^2_{Y,MX}$ = proportion of variance in DV explained by M & IV; k^2 = Kappa-squared is a measure of Indirect Effect (*ab*) size; Cohen's (1988) guidelines for small, medium, and large effect sizes as .01, .09, and .25 (pp. 79–81) were used to estimate the magnitude of k^2 (Hayes, 2013).

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CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The main purpose of this study was to expand the *acceptance model* of *intuitive eating* proposed by Avalos and Tylka (2006) and tested in empirical research (e.g., Augustus-Horvath & Tylka, 2011; Iannantuono & Tylka, 2012), by examining the relative and unique contributions of dispositional *mindfulness*, habitual use of *emotion regulation strategies*, and *body appreciatio*n to *intuitive eating* behaviors within a sample of emerging adult college women. Specifically, the present study examined the extent to which measures of unidimensional *mindfulness,* habitual use of *adaptive* and *maladaptive emotion regulation strategies*, and *body appreciation* predict *intuitive eating* over and above *body mass index* (BMI), based on the assumption that mindful processing style, adaptive emotion regulation, and body appreciation may constitute vital "transtherapeutic" processes underlying healthy eating behaviors as opposed to "transdiagnostic" core pathological processes existing across psychological disorders including eating disorders (e.g., Aldao, 2012, 2013; Aldao & Nolen-Hoeksema, 2010; Barlow, Bullis, Comer, & Ametaj, 2013; Choate-Summers, 2011; Desrosiers et al., 2013; Greeson et al., 2014; Tylka & Wood-Barcalow, 2015c; Vago & Silbersweig, 2012; Wood-Barcalow et al., 2010). The second distinct aim of the current investigation was to explore the unique associations between various distinct facets of unidimensional *mindfulness* and *intuitive eating* (IES-2), while controlling for *body mass index* (BMI). In an effort to extend the existing literature in this area, this study employed a multidimensional measure of mindfulness (FFMQ) that assessed the facets of *acting with awareness, non-reactivity, non-judgment, describing,* and *observing.* In an effort to extend the

existing literature, this study examined whether unidimensional dispositional *mindfulness* (FFMQ) explain unique variance in *intuitive eating* (IES-2) beyond the variance explained by other study predictors such as *emotion regulation strategies* and *body appreciation* (BAS). Similarly, another aim of this study was to determine whether habitual use of *adaptive* and *maladaptive emotion regulation strategies* significantly contribute *to intuitive eating* (IES-2) after accounting for dispositional *mindfulness* (FFMQ) and *body appreciation* (BAS). Based on strong evidence indicating that body appreciation (BAS) is the most robust predictor of intuitive eating (e.g., Andrew et al., 2015b; Augustus-Horvath & Tylka, 2011; Avalos et al., 2005), the current study was conducted to define the extent to which *body appreciation* (BAS) predicted intuitive eating over and above preexisting "transtherapeutic" processes such as dispositional *mindfulness* (FFMQ) and habitual use of *adaptive* and *maladaptive emotion regulation strategies.* Finally, the last aim of this study was to to test a theoretically and empirically driven model of *intuitive eating* (IES-2) (e.g., Avalos & Tylka, 2006; Barrett, 2009; Garland, Farb, et al., 2015a,b; Gottlieb et al., 2006; Gross, 1998a, b; Heatherton & Baumeister, 1991; Hölzel et al., 2011), where independent contributing variables including *maladaptive emotion regulation strategies, adaptive emotion regulation strategies*, unidimensional *mindfulness* (FFMQ), and *body appreciation* (BAS) were placed in a predetermined order according to their theoretical and empirical importance. As part of post hoc analyses, the study also investigated the mediating role of the *non-judging* mindfulness (FFMQ) facet in the association between the a*cting with awareness* mindfulness (FFMQ) facet and intuitive eating (IES-2), and the mediating role of *body appreciation* (BAS) in the relationships between three other study predictors (i.e., unidimensional *mindfulness* (FFMQ), *adaptive emotion regulation strategies*, and *maladaptive emotion regulation strategies*) and *intuitive eating* (IES-2).

The study was guided by recent advances in psychological science, neuroscience, prevention, and mindfulness research suggesting that complex cognitive, emotional, and behavior regulation processes underlie successful and unsuccessful self-regulation of eating behaviors (Anestis et al.,

2007; Cook-Cottone, 2016; Heron, Scott, Sliwinski, & Smyth, 2014; Masuda et al., 2012; Meule & Vögele, 2013; Micanti et al., 2016). The study hypotheses were based on theoretical framework derived from mindfulness, emotion, and emotion regulation theories, affect regulation models of disordered eating, intuitive eating theory, and systems view (e.g., Anestis et al., 2007; Avalos & Tylka, 2006; Barrett, 2009; Cash, 2011; Garland, Farb, et al., 2015a,b; Gottlieb et al., 2006; Gross, 1998a, b; Heatherton & Baumeister, 1991; Herman & Polivy, 1988; Hölzel et al., 2011; Lange & James, 1967; Shapiro et al., 2006; Thompson, 2011; Vago & Silbersweig, 2012) relevant for nurturing a positive caring relationship with one's body and for healthy eating behaviors (e.g., e.g., Cook-Cottone, 2015; Garland & Howard, 2014; Kristeller & Wolever, 2011). In this chapter, the findings relevant to the hypotheses were discussed. Also, limitations of the current study as well as suggestions for future research were addressed, followed by several practical implications.

Specific Findings and Interpretation of Results

Mindfulness, Emotion Regulation, and Body Appreciation as a Set of Contributors

Importantly, as a whole, the full model comprising the covariate *body mass index*, dispositional unidimensional *mindfulness* (FFMQ), *adaptive* and *maladaptive emotion regulation strategies*, and *body appreciation* (BAS) significantly contributed to *intuitive eating* (IES-2), accounting for approximately 40% of its variance among college women and suggesting a large in magnitude effect size (Cohen et al., 2003). This effect size speaks to the overall predictive power of a set of predictors including dispositional *mindfulness* (FFMQ), habitual use of *adaptive* and *maladaptive emotion regulation strategies*, and *body appreciation* (BAS), providing evidence that inclusion of these predictors significantly improved the model accounting for an additional 36% of the variance in *intuitive eati*ng (IES-2) over and above 4% of the variance explained by *body mass index* (BMI), suggesting a large in magnitude effect size (Cohen et al., 2003). Notably, this effect size is comparable with effect size of the structural *acceptance model* which explained *intuitive eating* in

research conducted by Tylka and colleagues (44%, Augustus-Horvath & Tylka, 2011; 40%, Iannantuono & Tylka, 2012). Conceptually, these findings suggest that various cognitive, affective, and behavioral processes including dispositional *mindfulness*, *emotion regulation strategies*, and *body appreciation* play crucial roles in *intuitive eating* in college women.

Consistent with the study hypothesis, when entered together as a set after accounting for the variance explained by *body mass index* (BMI), three predictor variables explained a significant proportion of unique variance in *intuitive eating* (IES-2), including dispositional *mindfulness* (FFMQ; 1%), *maladaptive emotion regulation strategies* (1%), and *body appreciation* (BAS; 16%). The role of the above mentioned predictors in eating behaviors was established in previous research (Avalos & Tylka, 2006; Evers et al., 2010; Lavender et al., 2009; Oh et al., 2012; Sairanen et al., 2015; Svaldi, Griepenstroh, et al., 2012). However, contrary to the hypothesis, in this model *adaptive emotion regulation strategies* did not significantly account for a unique portion of variance in *intuitive eating* (IES-2). This unexpected lack of significant relationship between *adaptive emotion regulation strategies* total score and *intuitive eating* (IES-2) in the present study may be explained by the presence of another predictor (e.g., *body appreciation*) influencing the strength of the relationship between *adaptive emotion regulation strategies* and *intuitive eating* (IES-2) (Baron & Kenny, 1986; MacKinnon et al., 2000, 2007; Hayes, 2009, 2013).

Contribution Body Mass Index as a Confounding Variable

In all hierarchical regression analyses conducted in this study, *body mass index* (BMI), a covariate of *intuitive eating* (IES-2), significantly contributed to *intuitive eating* (4%). In other words, in college women, the report of intuitive eating was less common in higher *body mass index* (BMI) categories, suggesting that college women with lower body weight tend to eat more intuitively. This fininding suggests that regardless of whether *intuitive eating* explicitly includes the goal of normalising weight, having lower body weight/BMI should be associated with higher *intuitive eating*

in college women (Gast & Hawks, 1998).

This result reinforces similar conclusions from previous studies conducted in samples of young college women from U.S. universities suggesting that the closer young women are to the culturally prescribed weight ideal as measured by *body mass index* (BMI) the higher *intuitive eating* they have (e.g., Hawks, Madanat, Hawks, & Harris, 2005; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Smith & Hawks, 2006; Tylka, 2006). Moreover, the current study is consistent with the clinical studies (for review, see Van Dyke & Drinkwater, 2014) providing evidence that implementation of an interventions focused on *intuitive eating* approach assists in weight maintenance for Caucasian women. Additionally, the cross-sectional nature of the current study does not allow for an interpretation of whether these aspects of intuitive eating lead to a normal *body mass index* (BMI), or rather that individuals of normal *body mass index* (BMI) are more likely to trust their body signals regarding feelings of hunger and satiety. In all likelihood, the relationship is of a bi-directional nature.

Contribution of Dispositional Mindfulness

The original acceptance model of *intuitive eating* (Avalos & Tylka, 2006) was focused on *body appreciation* (BAS) as the most robust predictor of *intuitive eating*. The present study results support and augmen this model by suggesting that other variables such as dispositional *mindfulness* (FFMQ) and *emotion regulation strategies* may be associated with *intuitive eating* (IES-2). Importantly, these results go beyond extant literature by demonstrating that dispositional *mindfulness* (FFMQ) is another powerful contributor to *intuitive eating* (IES-2).

Contribution of five mindfulness facets to intuitive eating. For example, results of the study revealed that after the contribution of *body mass index* (BMI), adding five *mindfulness* (FFMQ) facets together in the second step of the regression analysis significantly improved the model, accounting for an additional 19% of the unique variance in *intuitive eating* among college women,

suggesting a medium in magnitude effect size (Cohen et al., 2003).

With regard to the relative contribution of specific mindfulness facets, only four of the mindfulness (FFMQ) facets including *non-judging* (3%), *non-reactivity* (3%), *describing* (2%), and *observing* (1%) significantly and positively accounted for the unique variance in *intuitive eating* (IES-2) above and beyond the variance accounted for by *body mass index* (BMI), suggesting that young women who are able to label observed phenomena with words and who are attending to everyday life situations with a non- judging, non-reactive, receptive, and open to inner experiences stance (Brown & Ryan, 2003; Cardaciotto et al., 2008; Kabat-Zinn, 1990, 2003, 2005; Kristeller & Wolever, 2011; Levesque & Brown, 2007) tend to eat more intuitively guided by their hunger and not by emotional or external cues. Although one study on *intuitive eating* conducted by Sairanen and colleagues (2015) examined the contribution of separate *mindfulness* facets to three individual Intuitive Eating subscales (Unconditional Permission to Eat, Eating for Physical Reasons, and Reliance on Hunger/Satiety Cues), comparing results of the present study with results received by Sairanen and colleagues (2015) would not be statistically appropriate. The reason is that Sairanen and colleagues (2015) examined the extent to which separate *mindfulnes*s facets contributed to individual *intuitive eating* subscales and did not examine the contribution of all five *mindfulness* facets as a set to *intuitive eating* total score.

Findings of the current study are overall consistent with negative associations found between the *non-judging*, *non-reactivity*, and *describing* mindfulness facets and disordered eating behaviors across various populations including college students (Adams et al., 2012; Lavender et al., 2011; Tak et al., 2015). Results of the current study related to the unique positive contribution of the *observing* mindfulness (FFMQ) facet to *intuitive eating* (IES-2) contradicted findings from previous research which examined *mindfulness* facets in the context of disordered eating behaviors. For example, in contrast to the present findings, previous studies found that the *observing* mindfulness (FFMQ) facet either predicted more symptoms of eating pathology (Adams et al., 2012; Prowse et al., 2013) and restrained eating behaviors (Tak et al., 2015), or was completely unrelated to symptoms of disordered

eating (Lavender et al., 2011) including external, emotional, uncontrolled (Lattimore et al., 2011; Tak et al., 2015), and restraint eating behaviors (Lattimore et al., 2011). The unique positive contribution of the *observing* mindfulness (FFMQ) facet to *intuitive eating* (IES-2) in this study may be explained by specific nature of *intuitive eating* behavior (IES-2), in which the ability to *observe* noticing or attending to internal (i.e., hunger and satiety cues) and external experiences (i.e., smells, taste, sensations) may be particularly important. Positive significant unique contribution of the *observing* mindfulness (FFMQ) facet to *intuitive eating* (IES-2) is consistent with theoretical literature highlighting the role of the observing quality as an essential aspect of mindfulness (Bishop et al., 2004; Brown & Ryan, 2003; Kabat-Zinn, 1994).

With regard to the contribution of *acting with awareness* (FFMQ), contrary to the hypothesis, when entered together with other mindfulness facets, *acting with awareness* did not significantly contribute to the variance in *intuitive eating* (IES-2) in the current study. This result contradicted empirical and theoretical literature showing that paying full attention to the current activities without an automatic pilot is one of the most significant aspects of mindfulness associated with indices of wellbeing and psychological health (Baer et al., 2006, 2008; Bishop et al., 2004; Cardaciotto et al., 2008; Malinowski, 2013; Shapiro et al., 2006). One possible explanation for this unexpected result could be attributed to the mediating role of another *mindfulness* (FFMQ) facet (e.g., *non-judging*) which was influencing the strength of the relationship between *acting with awareness* and *intuitive eating* (IES-2) (Baron & Kenny, 1986; MacKinnon et al., 2000, 2007; Hayes, 2009, 2013). Hypothetically, as a mediator, the *non-judging* facet could explain part or all of this relationship because it was in the causal path between *acting with awareness* (FFMQ) and *intuitive eating* (IES-2).

Contribution of unidimensional mindfulness to intuitive eating. With respect to the predictive power of unidimensional *mindfulness* (FFMQ), it was found that college women who were eating more intuitively were overall more mindful in everyday life situations. Importantly, unidimensional dispositional *mindfulness* (FFMQ) contributed 3% of the unique variance to *intuitive*

eating (IES-2) among college women after accounting for the contribution of *body appreciation* (BAS). Although 3 % is a small effect size, it means that dispositional *mindfulness* (FFMQ) is important for *intuitive eating* (IES-2) because it comprises qualities that are unique and not present in *body appreciation* (BAS). Likewise, after accounting for the variance explained by *adaptive and maladaptive emotion regulation strategies*, unidimensional dispositional *mindfulness* (FFMQ) contributed 6% of the unique variance to *intuitive eating* (IES-2) which was equal to a small effect size. These results suggest that dispositional *mindfulness* is manifested by unique characteristics that are not present in *emotion regulation strategies*. Although there have been no previous research studies examining the contribution of dispositional *mindfulness* to adaptive eating behaviors over and above the contribution of positive body image and use of emotion regulation strategies, results of this study match those observed in previous research which demonstrated the role of dispositional *mindfulness* in adaptive (e.g., intuitive eating) eating behaviors (Beshara et al., 2013; Jordan et al., 2014; Pidgeon et al., 2013; Sairanen et al., 2015), as well as maladaptive (e.g., emotional and external eating) and disordered eating behaviors (Lattimore et al., 2011; Lavender et al., 2009; Lavender et al., 2011; Masuda & Wendell, 2010; Ouwens et al., 2015; Pidgeon et al., 2013; Tak et al., 2015).

Taken together, these findings provide strong evidence that *mindfulness* encourages *intuitive eating* confirming theoretical conceptualizations of *mindfulness* in which mindfulness exerts its effect on indices of wellbeing (e.g., intuitive eating) through improved *emotional regulation* (Chambers et al., 2009; Holzel et al., 2011; Shapiro et al., 2006; Tang & Tang 2015b; Tang et al., 2015; Vago & Silbersweig, 2012), increased use of *adaptive emotion regulation strategies* such as positive reappraisal (Garland & Fredrickson, 2013; Garland et al., 2011; Garland et al., 2009; Garland, Farb, 2015a, b), change in perspective on the self (Holzel et al., 2011), and more positive self-narratives (Garland, Farb, 2015a, b; Shapiro et al.; 2006; Vago & Silbersweig, 2012). Moreover, the association between dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2) may be explained by a shift of attention to previously unattended positive contextual data (Garland, Farb, et al., 2015a,b), or by an

enhanced ability to experience reward from body related experiences such as savoring food (Garland et al., 2010; Garland, Farb, et al., 2015a,b; Garland, Geschwind, et al., 2015). The association between dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2) may be also accounted for by improved body awareness including greater interoceptive sensitivity to hunger and satiety cues (Farb et al., 2015; Hölzel et al., 2011; Kabat-Zinn, 2005; Vago & Silbersweig, 2012), which are important factors for healthy adaptive eating behaviors (Kristeller & Wolever, 2011) such as intuitive eating (Herbert et al., 2013; Oh et al., 2012).

Contribution of Emotional Regulation Strategies

As to the role of habitual use of putatively *adaptive* and *maladaptive emotion regulation strategies* in *intuitive eating*, the present study extends extant literature by yielding an important finding that *adaptive emotion regulation strategies* and *maladaptive emotion regulation strategies* are two other significant predictors of *intuitive eating* (IES-2) in college women. After controlling for *body mass index* (BMI), the contributions of two groups of *emotion regulation strategies* (*adaptive* and *maladaptive*) explained an additional 13% of the variance in *intuitive eating* equal a medium effect size (Cohen et al., 2003). *Adaptive emotion regulation strategies* accounted for a larger proportion of unique variance (8%) in *intuitive eating* (IES-2) compared to *maladaptive emotion regulation strategies* (5%). Both unique contributions were equal to a small effect size. Furthermore, when entered to the model at the third step, *adaptive* and *maladaptive emotion regulation strategies* total scores added 2% to the explanation of *intuitive eating* (IES-2) over and above the explanation provided by unidimensional *mindfulness* (FFMQ), and 3% over and above the explanation provided by *body appreciation* (BAS), suggesting small effect sizes in both cases. These encouraging results indicate that specific use of *adaptive and maladaptive emotion regulation strategies* is relevant for *intuitive eating* (IES-2) because of the unique properties not represented in unidimensional *mindfulness* (FFMQ) and *body appreciation* (BAS). These findings support a relatively small body of literature concerned with the role of emotional functioning in intuitive eating (for review, see Bruce

& Ricciardelli, 2016). For example, results of this study are consistent with previous research showing that intuitive eating is associated with higher acceptance of emotions and lower self-silencing (Shouse & Nilsson, 2011), higher distress tolerance (Schoenefeld & Webb, 2013), and higher adaptive coping skills (Tylka, 2006; Tylka & Wilcox, 2006). Furthermore, results of this study are in agreement with research studies focused on the contribution of emotion regulation difficulties to disordered eating behaviors in college women and men (Ambwani et al., 2014; Evers et al., 2010; Lafrance Robinson et al., 2014; Whiteside et al., 2007). Finally, these findings are in line with research in the area of eating disorders linking adaptive and maladaptive emotion regulation strategies with particular eating disorders (Aldao et al., 2010; Svaldi, Griepenstroh, et al., 2012).

Contribution of Body Appreciation

As predicted, similar to research studies testing the acceptance model of *intuitive eating* (e.g., Augustus-Horvath & Tylka, 2011; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Oh et al., 2012), *body appreciation* (BAS) was the most robust predictor of *intuitive eating* (IES-2) in this study. When all four explanatory variables were entered to the model simultaneously after controlling for *body mass index* (BMI), *body appreciation* accounted for a greater percentage of the variance in *intuitive eating* (16%), compared to the variance explained by unidimensional *mindfulness* (1%) and *maladaptive* (1%) *emotion regulation strategies*. Furthermore, when only *body appreciation* (BAS) was entered to the model at the second step after accounting for the variance explained by *body mass index* (BMI), its additional contribution to *intuitive eating* was equal to 32%, which was a large effect size (Cohen et al., 2003). Furthermore, *body appreciation* (BAS) added 17% to the explanation of *intuitive eating* (IES-2) over and above the explanation provided by unidimensional *mindfulness* (FFMQ), equal to a medium effect size. Similarly, *body appreciation* (BAS) accounted for 21% of the additional unique variance in *intuitive eating* (IES-2) over and above the variance explained by *adaptive* and *maladaptive emotion regulation strategies* total scores, corresponding to a medium effect size.

The strength of the predictive power of *body appreciation* (BAS) is not surprising. Conceptually, *intuitive eating* has been considered a behavioral manifestation of *body appreciation* (e.g., Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh et al., 2012), probably because it is grounded in internal body orientation including resistance to adopt an observer's perspective of one's body (Tylka & Homan, 2015) and interoceptive sensitivity (e.g., Augustus-Horvath & Tylka, 2011, Herbert et al., 2013; Iannantono & Tylka, 2012; Tylka, Calogero, et al., 2015; Tylka & Kroon Van Diest, 2013), relevant for both positive body image and adaptive eating behaviors such as *intuitive eating* (e.g., Avalos & Tylka, 2006; Tribole & Resch, 1996; Tylka, 2006). Indeed, there is evidence that those who appreciate their bodies and are attuned to their bodies may respect and take care of their bodies eating according to body interoceptive signals (e.g., Herbert et al., 2013; Herbert & Pollatos, 2012), especially to interoception related to hunger and satiety (e.g., Tylka, 2006).

Conceptual Model of Intuitive Eating

In this study, a conceptual model of *intuitive eating* was tested. Independent variables were entered to the model in a pre-specified order dictated by the hierarchical relevance of each variable to the criterion (Petrocelli, 2003). First, the most distal and least important variables were entered to the model. Next, other more proximal and more important variables were added to the model. *Body mass index* (BMI) as a physiological covariate of *intuitive eating* (IES-2) that was not in focus of this research was the first variable in this order (Tylka, 2006; Schoenefeld & Webb, 2013; Tylka & Kroon Van Diest, 2013). While the habitual use of *maladaptive emotion regulation strategies* was the second variable in the order, the habitual use of *adaptive emotion regulation strategies* was the third added variable, mainly because theoretically *maladaptive emotion regulation strategies* could be less important and less protective for healthy self-caring eating behaviors than *adaptive emotion regulation strategies* (Aldao & Nolen-Hoeksema, 2010). Unidimensional *dispositional mindfulness* (FFMQ) as a more advanced overarching metacognitive skill compared to *emotion regulation strategies* serving the function of an information processing filter (Farb et al., 2015; Hölzel et al.,

2011; Vago & Silbersweig, 2012) was the fourth variable in the hierarchical order. Finally, based on previous research findings, *body appreciation* (BAS) as the most important explanatory variable in the order took the most proximal position to *intuitive eating* (IES-2) (Augustus-Horvath & Tylka, 2011; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Oh et al., 2012).

Results demonstrated that each variable significantly added to the model above and beyond previously entered variables. For example, *body mass index* (BMI) explained 4% of the unique variance in *intuitive eating* (IES-2) (equal to a small effect size). *Maladaptive emotion regulation strategies* explained 5% of the additional unique variance in *intuitive eating* (IES-2) (equal to small effect size) over and above the variance explained by *body mass index* (BMI). *Adaptive emotion regulation strategies* added 8 % of the additional unique variance in intuitive eating (IES-2) (equal to a small effect size) over and above the variance accounted for by *body mass index* (BMI) and *maladaptive emotion regulation strategies*. In its turn, unidimensional dispositional *mindfulness* (FFMQ) explained 6% of the additional unique variance in intuitive eating (IES-2) (equal to small effect size) over and above the variance explained by *body mass index* (BMI), *maladaptive emotion regulation strategies*, and *adaptive emotion regulation strategies.* Finally, *body appreciation* (BAS) accounted for 16 % of the unique additional variance in *intuitive eating* (IES-2) (equal to a medium effect size) over and above the variance explained by predictors added to the model in previous steps. The contribution of the whole model (40%) was equal to a large effect size. These results suggest that each of these variables have qualities not present in variables entered to the model in previous steps. For example, habitual use of putatively *adaptive emotion regulation strategies* including ability to positively reframe negative internal and external events, to accept their emotions, to be able to find solutions to problems, to plan them, and to implement solutions in their lives accordingly, may be relevant for college women's *intuitive eating* behaviors, regardless their habitual use of putatively *maladaptive emotion regulation strategies*, including their tendency to suppress or avoid unpleasant thoughts, to suppress emotions and their behavioral manifestations, to think over and over again about

unpleasant situations and to blame themselves for them, to look for distracting activities in order to take their attention from unpleasant emotions or situations, and to try to avoid situations that may remind them of unpleasant events. Likewise, participants' dispositional *mindfulness* is important for college women's ability to eat intuitively regardless their habitual use of *maladaptive* and *adaptive emotion regulation strategies*. Finally, participants' ability to appreciate their bodies was the most important factor in forming their *intuitive eating* behaviors, regardless their use of *emotional regulation strategies* and their everyday *mindfulness*. Overall, results of this study indicate that all predictors included in the model are important for maintenance of *intuitive eating* in college women. These results are consistent with previous studies showing the role of unidimensional *mindfulness* (FFMQ) (e.g., Lavender et al., 2009; Masuda et al., 2012), *adaptive* and *maladaptive emotion regulation strategies* (e.g., Aldao et al., 2010; Brockmeyer et al., 2014; Svaldi et al., 2012), and *body appreciation* (BAS) in eating behaviors (e.g., Andrew et al., 2015b; Augustus-Horvath & Tylka, 2011; Avalos et al., 2005),

Mediating Role of the Non-Judging Mindfulness Facet

The post hoc bootstrapping mediation analysis revealed that the *acting with awareness* mindfulness (FFMQ) facet had a medium and statistically significant indirect effect on *intuitive eating* (IES-2) through the *non-judging* mindfulness (FFMQ) facet accounting for around 11% of its maximum possible value. This result suggests that when college women pay full attention to present-moment activities without an automatic pilot applying the acting with awareness mindfulness quality more frequently, they are more accepting of their thoughts and emotions without judging them demonstrating higher use of the non-judging mindfulness quality. Consequently, being less judgmental and more accepting of their thoughts and emotions helps them to eat more intuitively. As to the direct effect of the *acting with awareness* mindfulness (FFMQ) facet on *intuitive eating* (IES-2), this study revealed that the extent to which college women were focused on present-moment activities was directly affecting their ability to eat intuitively regardless their ability to accept their

thoughts and emotions without judging them.

Results of this post hoc analysis are consistent with the theoretical models of *mindfulness* emphasizing the central role of attention regulation (Brown & Ryan, 2003; Carmody, 2009; Grabovac et al., 2011; Holzel et al., 2011; Lutz et al., 2008; Malinowski, 2013; Shapiro et al., 2006; Tang & Tang 2015a, b; Tang et al., 2015; Vago & Silbersweig, 2012) and claiming that an open, non-judgmental and accepting orientation to experience is a consequence of the initial self-regulation of attention elicited through awareness to immediate life experiences (Bishop et al., 2004; Cardaciotto et al., 2008; Malinowski, 2013; Shapiro et al., 2006). Indeed, there seems a clear ground for the idea that to the *non-judging* mindfulness facet plays an important role in the relationship between the *acting with awareness* mindfulness quality and *intuitive eating* because when faced with unwanted experiences, such as aversive affect, cognitions, or sensations, individuals who have the *non-judging* mindfulness quality refrain from applying evaluative labels such as right/wrong, good/bad, good food/bad food, feast/famine, fat/thin, worthwhile/ worthless accepting reality to be as it is without attempts to avoid, escape, or change it (Baer, Smith, & Allen, 2004). In line with this study results, two recent studies demonstrated the mediating role of the non-judging mindfulness facet in the relationship between mindfulness practice and indices of well-being (Kohls, Sauer, & Walach, 2009; van den Hurk et al., 2011). Moreover, in accordance with the present results, previous studies demonstrated that attention to and awareness of what is occurring in the present as measured by the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) was associated with less eating pathology resulting in healthier eating behaviors (e.g., Jordan et al., 2014; Lavender et al., 2009; Masuda & Wendell, 2010). Findings broadly reflect clinical studies focused on the role of individual mindfulness facets, which suggested a significant negative association between the *acting with awareness* mindfulness (FFMQ) facet and symptoms of disordered eating behaviors (Adams et al., 2012; Lavender et al., 2011; Prowse et al., 2013) including incidents of external and emotional eating (Tak et al., 2015). Similarly, results of this study are consistent with previous research showing that

the *non-judging* mindfulness facet predicted lower symptoms of eating pathology (Adams et al., 2012; Lavender et al., 2011; Prowse et al., 2013) and lower rates of disordered eating behaviors including restrained, external, and emotional eating (Tak et al., 2015).

Thus, results of the present study pertaining to the contribution of separate *mindfulness* facets (FFMQ) to *intuitive eating* (IES-2) suggest that in order to develop *intuitive eating* behaviors, college women need to enhance all five mindfulness skills (Linehan, 1993) corresponding to the *acting with awareness*, the *non-judging*, the *non-reactivity*, the *describing*, and the *observing* mindfulness facets (FFMQ; Baer et al., 2006). However, results seem to add evidence to the view that the development of the mindfulness non-judging quality is a key mechanism for intuitive eating skills. It might be insightful for clinical studies as well as for prevention studies to focus on this factor.

Mediating Role of Body Appreciation

An important observation worth mentioning is that in all models containing *body appreciation* (BAS), contribution of predictors added to the model at the second step was reduced when *body appreciation* (BAS) was added to the model at the third step. For example, the unique contribution of unidimensional dispositional *mindfulness* (FFMQ) dropped from 18% at the second step to 3% at the third step when *body appreciation* (BAS) was entered to the model. Moreover, the unique contribution of *adaptive emotion regulation strategies* dropped from 8% at the second step to 1% at the third step when *body appreciation* (BAS) was added to the model. Similarly, the unique contribution of *maladaptive emotion regulation strategies* which was significant at the second step explaining 5% of the unique variance in *intuitive eating* (IES-2), became insignificant after *body appreciation* (BAS) was added to the model at the third step. These results suggested the potential mediating role of *body appreciation* (BAS) in the relationship between dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2), and between *adaptive* and *maladaptive emotion regulation strategies* and *intuitive eating* (IES-2) (MacKinnon et al., 2000, 2007; Hayes, 2009, 2013).

Consequently, post hoc bootstrapping mediation analyses were conducted. All post hoc analyses confirmed the mediating role of *body appreciation* (BAS).

Indirect effect of dispositional mindfulness on intuitive eating. For example, as predicted, post hoc analysis examining the mediating role of *body appreciation* (BAS) in the relationship between dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2) revealed that dispositional *mindfulness* (FFMQ) exerted a medium to large (24%) indirect effect (Preacher & Kelley, 2011) on *intuitive eating* (IES-2) through *body appreciation* (BAS). The presence of the indirect effect of dispositional *mindfulness* (FFMQ) on *intuitive eating* (IES-2) suggests that higher everyday mindfulness in college women is helping them to experience greater body appreciation, which in turn is associated with their ability to eat more intuitively. As to the direct association between dispositional *mindfulness* (FFMQ) and *intuitive eating* (IES-2), results this study revealed that there was a significant direct effect of dispositional *mindfulness* (FFMQ) on *intuitive eating* (IES-2) in college women, meaning that regardless young women's ability to appreciate their bodies, being mindful in everyday life situations is helping them to eat more intuitively. In other words, although evidence for the indirect mechanism has been found, it appears that dispositional mindfulness (FFMQ) itself orients college women in a way that is conducive to *intuitive eating* (IES-2), even in the absence of specific training focused on mindful eating.

These findings are in line with mindfulness theory which posits that mindfulness exerts its effect on indices of wellbeing (i.e., intuitive eating) through body image related processes including awareness and acceptance of body imperfections (Bishop et al., 2004; Cardaciotto et al., 2008; Shapiro et al., 2006), meaningful change in perspective on the self (Garland et al., 2010; Garland & Fredrickson, 2013; Garland, Farb, et al., 2015a,b; Holzel et al., 2011), positive self-narratives (Garland, Farb, 2015a, b; Shapiro et al.; 2006; Vago & Silbersweig, 2012) such as favorable opinions of the body regardless of actual appearance, better insight (Brown et al., 2007) into the influence of unrealistic media body ideals, and enhanced body awareness (Farb et al., 2015; Holzel et al., 2011)

that allows women to attend to the body's needs and to engage in healthy self-care behaviors. These findings are consistent with empirical research showing that mindfulness is positively associated with an adaptive, flexible, and compassionate response to aversive body-related thoughts, feelings, and behaviors (Sandoz et al., 2013; Stewart, 2004) such as body satisfaction (Dekeyser et al., 2008; Dijkstra, & Barelds, 2011; Lavender, Gratz, & Anderson, 2012) and enhanced self-care (Cook-Cottone, 2006; Greeson et al., 2014; Slonim et al., 2015; Webb et al., 2015). Importantly, findings extend recent research that demonstrated that more mindful individuals reported healthier eating behaviors including lower disinhibited eating, reduced calorie consumption, more appropriate serving sizes, and increased consumption of healthier snacks (Beshara et al., 2013; Jordan et al., 2014).

Indirect effect of adaptive emotion regulation strategies on intuitive eating. A post hoc bootstrapping mediation analysis focused on the mediating role of *body appreciation* (BAS) in the relationship between habitual use *adaptive emotion regulation strategies* and *intuitive eating* (IES-2) determined that habitual use of *adaptive emotion regulation strategies* exerted a medium to large (22%) indirect effect (Preacher & Kelley, 2011) on *intuitive eating* (IES-2) through *body appreciation* (BAS). These results suggest that more frequent use of *adaptive emotion regulation strategies* (i.e., *positive reappraisal, acceptance of emotions, cognitive problems solving,* and *behavioral problem solving*) is important for young women to have higher body appreciation, which in turn helps them to eat more intuitively. As to the insignificant mediating direct effect of habitual use of *adaptive emotion regulation strategies* on *intuitive eating* (IES-2) in college women, this study results suggest that the extent to which college women use *adaptive emotion regulation strategies* is affecting their ability to eat intuitively exclusively through making them more appreciative of their bodies (Rucker et al., 2011). The fact that indirect effect was revealed in the absence of direct effect indicates that unless participants endorse *body appreciation*, habitual use of *adaptive emotion regulation strategies* is not helping them to eat intuitively. It may be that college women who were eating more intuitively benefitted from the use *adaptive emotion regulation strategies* only because *adaptive emotion*

regulation strategies helped them to appreciate their bodies.

A possible explanation for the relationship between use of *adaptive emotion regulation strategies* and *body appreciation* (BAS) might be that women high on habitual use of *adaptive emotion regulation strategies* have higher interoceptive awareness making them more attuned to their bodily needs (Farb et al., 2015; Füstös et al., 2013). Moreover, it is likely that women who use *adaptive emotion regulation strategies* more frequently tend to hold more positive evaluations of their bodies because they accept negative emotions associated with their bodies' imperfections and reframe body-image threatening information in a positive way (Andrew et al., 2015b; Avalos et al., 2005; Swami, Hadji-Michael, et al., 2008; Tylka & Wood-Barcalow, 2015b). Another possible explanation is that more frequent use of *adaptive emotion regulation strategies* helps women to keep a cheerful, optimistic, and self-compassionate outlook associated with *body appreciation* (Avalos et al., 2005; Dalley & Vidal, 2013; Tylka, & Wood-Barcalow, 2015b; Wasylkiw et al., 2012). Although findings are consistent with intuitive eating literature showing that the cognitive-emotional and affective components of *body appreciation* (BAS) are effective in inducing *intuitive eating* (IES-2), this study also supports evidence from disordered eating literature focused on the role of emotional regulation in body image perception (e.g., Lavender & Anderson, 2010; Moore, Masuda, Hill, & Goodnight, 2014; Park et al., 2011, 2012; Sim & Zeman, 2006).

Indirect effect of maladaptive emotion regulation strategies on intuitive eating.

Similarly, a bootstrapping mediation analysis focused on the mediating role of *body appreciation* (BAS) in the relationship between *maladaptive emotion regulation strategies* and *intuitive eating* (IES-2) indicated that habitual use *maladaptive emotion regulation strategies* transmitted a medium (13%) negative indirect effect (Preacher & Kelley, 2011) on *intuitive eating* (IES-2) through *body appreciation* (BAS). These results imply that when college women use *maladaptive emotion regulation strategies* (i.e., *mental distraction, expressive suppression, self-critical rumination,* and *behavioral avoidance/distraction*) more frequently, they are less appreciative of their bodies.

Consequently, holding lower *body appreciation* hinders their ability to eat intuitively. As to the direct significant effect of habitual use of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) practices, this study revealed that the extent to which college women use *maladaptive emotion regulation strategies* to regulate their negative emotions associated with stressful events was directly affecting their ability to eat intuitively. The presence of the direct effect of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) suggests that regardless of their ability to appreciate their bodies, women who use *maladaptive emotion regulation strategies* less frequently are more intuitive eaters.

Indirect effect of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2) may be explained by the affect regulation theories (Anestis et al., 2007; Cash, 2011; Heatherton & Baumeister, 1991) suggesting that in the absence of more *adaptive emotion regulation strategies (*e.g., *positive reappraisal*), women use avoidant *maladaptive emotion regulation strategies* including inhibited restrictive or disinhibited emotional eating in order to alleviate, suppress, or otherwise control the experience of aversive cognitive and affective self-evaluations about the body pointing to body image disturbances (Corstorphine et al., 2007; Evers et al., 2010; Heatherton & Baumeister, 1991; Macht, 2008) and, thus, to low *body appreciation* (Andrew et al., 2016c; Avalos et al., 2005; Iannantuono & Tylka, 2012; Swami & Tovée, 2009; Tylka, 2013; Tylka & Kroon Van Diest, 2013; Tylka & Wood-Barcalow, 2015b). The positive association between use of *maladaptive emotion regulation strategies* and negative body image has been previously confirmed empirically (e.g., Lavender & Anderson, 2010; Moore et al., 2014; Park et al., 2011, 2012; Sim & Zeman, 2006). Another possible explanation for these findings is rooted in the James-Lange theory of emotions (Lange & James, 1967) proposing that women with emotion regulation deficits may experience lower interoceptive awareness including poor attunement to hunger and satiety cues (Farb et al., 2015; Füstös et al., 2013) resulting in lack of ability to attend to their bodily needs, and, consequently, in poor *body appreciation* (BAS). The negative association between interoceptive awareness and *body*

appreciation (BAS) has been previously confirmed empirically (Tylka, Calogero, et al., 2015; Tylka & Kroon Van Diest, 2013). These findings suggest that enabling college women to use *maladaptive emotion regulation strategies* less frequently is an important way of increasing the positive effect of *body appreciation* (BAS) on *intuitive eating* (IES-2) among this population.

As to the significant negative direct effect of *maladaptive emotion regulation strategies* on *intuitive eating* (IES-2), this detrimental influence may be explained by affect regulation theories of eating disorders (e.g., Heatherton & Baumeister, 1991; Herman & Polivy, 1988; Macht, 2008; Macht et al., 2004; Polivy & Herman, 2002; Cowdrey & Park, 2012) suggesting that college women regulating their emotions by *maladaptive emotion regulation strategies* may be more likely to resort to emotional and disinhibited eating as a form of emotion-regulation strategy and less likely to eat intuitively, because *maladaptive emotion regulation strategies* such as emotional eating fill the women's emotion-regulation needs and emotional eating contradicts principles of *intuitive eating* (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Tylka, 2006; Tylka & Kroon Van Diest, 2013).

To conclude, results of this study mediation analyses examining the mediating role of body appreciation (BAS) are consistent with previous intuitive eating research in which body appreciation (BAS) was upheld as a mediator in the acceptance model of intuitive eating. For example, Augustus-Horvath and Tylka (2011), Avalos and Tylka (2006), and Oh and colleagues (2012) found that body appreciation mediated the relationship between body acceptance by others and intuitive eating. Similarly, Iannantuono and Tylka (2012) revealed that attachment anxiety, restrictive/critical caregiver eating messages, discrepancy perfectionism inversely predicted intuitive eating through their negative association with body appreciation.

Overall, the results of this study suggest that higher mindfulness in everyday life situations, more frequent use of adaptive emotion regulation strategies, and less frequent use of maladaptive

emotion regulation strategies are important for women's ability to eat all desired foods giving preference to foods that may enhance their body functioning listening to their hunger and satiety cues. College women become more intuitive eaters if they can attend to internal and external experiences (i.e., sensations, cognitions, emotions, sights, sounds, and smells), label internal experiences with words, allow thoughts and feelings to come and go without getting caught up in or carried away by them, and take a non-evaluative stance toward their thoughts and feelings. Women's mindful concentration on present-moment activities helps them to become less judgmental of thoughts and feelings, which in its turn supports their intuitive eating behaviors. The extent to which young women are able to appreciate their bodies, taking care of their bodies, respecting their bodies' needs, and protecting their bodies from negative evaluations of others and from media messages may matter for their intuitive eating behaviors, regardless their tendency to be mindful in everyday life situations and their habitual way of regulating their emotions. Importantly, women's everyday mindfulness and use of more adaptive emotion regulation strategies are helping them to enhance their body appreciation which in its turn promotes their intuitive eating tendencies. Importantly, women's habitual mindfulness increases their intuitive eating regardless their tendency to appreciate their bodies. Women's increased use of maladaptive emotion regulation strategies may hinder their intuitive eating behaviors even if they are able to appreciate their bodies. All the above findings have direct importance for clinical practice, prevention, and future research.

Conclusions

Implications for Clinical Practice and Prevention

In spite of the reliance on the student sample, results of this study may have implications for clinical practice. The findings from this study highlight the value of interventions focused on mindfulness, emotion regulation skills, and positive body image for intuitive eating behaviors. Specifically, preliminary evidence suggests that interventions targeting everyday mindfulness and

maladaptive emotion regulation strategies can improve intuitive eating abilities directly and indirectly through enhancing individuals' body appreciation. Moreover, clinicians can directly target non-judging qualities of mindfulness in mindfulness-based interventions, in order to enhance the beneficial effect of such interventions on intuitive eating. It could be that enhancing behaviors based on attention and awareness to the present moment without first, or simultaneously, increasing non-judging and non-evaluative qualities would diminish the beneficial effects of mindfulness on adaptive eating behaviors. Clinicians may enhance non-judgment using various mindfulness-based interventions especially those including the Loving-kindness Meditation (Boellinghaus, Jones, & Hutton, 2014). Furthermore, the findings from this investigation highlight the value of adaptive emotion regulation skills for intuitive eating behaviors. As this suggests, prevention and intervention programs focused on improvement of individuals' body appreciation as a way to enhance adaptive intuitive eating behaviors should include training of mindfulness and adaptive emotion regulation skills. Similarly, results of this study have implications for body image and eating disorder prevention programs that target regulatory skills important for healthy eating behaviors. For example, results of this study may improve already existing health-centered non-diet interventions focused on eating by internal cues (Clifford et al., 2015; Schaefer & Magnuson, 2014), so that, whenever possible, they include modules on mindfulness skills, adaptive emotion regulation skills, and body appreciation.

There are several non-diet approaches that implement intuitive eating and similar principles by shifting the focus away from weight outcomes to the improvement of health outcomes and psychological well-being (Schaefer & Magnuson, 2014). Among these approaches are the original intuitive eating intervention (Tribole & Resch, 2012), the My Body Knows When intuitive-eating program (Cole & Horacek, 2010), and the Health at Every Size approaches to eating (HAES; Bacon et al., 2002; Bacon, Stern, Van Loan, & Keim, 2005; Carbonneau et al., 2017; Gagnon-Girouard et al., 2010; Humphrey, Clifford, & Neyman Morris, 2015; Provencher et al., 2007; Leblanc et al., 2012). Although these approaches include various discussion topic, none of them involve

mindfulness, emotion regulation, and body appreciation. Only two identified intuitive eating approaches comprise some sort of mindfulness in their curricula. The Eat for Life intervention (Bush et al., 2014) contains daily mindfulness practice, eating meditations, and lectures on mindful eating. The Mind, Body, Food web-based weight gain prevention intervention (Boucher et al., 2016) is focused on psychological flexibility, the ability to remain mindfully aware and accepting of one's experience in the present moment (e.g., thoughts, feelings, bodily sensations) and to engage in behaviors that are consistent with one's values (Hayes, Strosahl, & Wilson, 1999). However, these interventions do not explicitly target body appreciation and adaptive emotion regulation. Thus, almost all programs for intuitive eating seem to lack effective mindfulness, emotion regulation, and body appreciation interventions. This situation is problematic, because conceptually mindfulness, emotion regulation, and body appreciation play an important role in adaptive eating behaviors (e.g., Anestis et al., 2007; Avalos & Tylka, 2006; Barrett, 2009; Cash, 2011; Garland, Farb, et al., 2015a, b; Gottlieb et al., 2006; Gross, 1998a, b; Heatherton & Baumeister, 1991; Herman & Polivy, 1988; Hölzel et al., 2011; Lange & James, 1967; Thompson, 2011; Vago & Silbersweig, 2012). Moreover, according to recent review studies (e.g., Godfrey et al., 2015; Katterman et al., 2014; O'Reilly et al., 2014) mindfulness-based interventions are effective for disordered eating behaviors (e.g., binge eating, emotional eating).

Usually, mindfulness based therapies include elements addressing participants' mindfulness and emotion regulation skills (Hofmann & Asmundson, 2008; Troy, Shallcross, Davis, Mauss, 2013). Among such therapies are Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn et al., 1992), Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002; Williams, Russell, & Russell, 2008), Acceptance and Commitment Therapy (ACT; Hayes et al., 1999; Hayes, Luoma, Bond, Masuda, & Lillis, 2006), and Dialectical Behavior Therapy (DBT; Linehan, 1993a, b; Linehan, 2015a, b). Both, clinicians working with individuals and groups in various settings (e.g., college counseling centers, youth counseling centers, community counselling centers, workplaces)

and psychologists engaged in intervention and prevention programming may select and integrate elements of mindfulness-based therapies (Hayes et al., 1999; Kabat-Zinn et al., 1992; Linehan, 1993a, b; Linehan, 2015a, b; Segal et al., 2002) and emotion regulation therapies (Berking, 2010; Berking et al., 2008; Mennin, 2006; Mennin & Fresco, 2013; O'Toole, Mennin, & Fresco, 2014) when designing remedial and preventive interventions. Clinicians may take the already existing programs that include mindfulness interventions for healthy eating behaviors as an example (e.g., Bahl, Milne, Ross, & Chan, 2013; Beccia, Dunlap, Hanes, Courneene, & Zwickey, 2018; Bush et al., 2014). Additionally, clinicians may encourage students to enhance their everyday *mindfulness* through counseling (Pistorello, 2013), straight forward mindfulness courses available for college students (Caldwell, Harrison, Adams, Quin, & Greeson, 2010; Dvořáková et al., 2017; Ching, Koo, Tsai, & Chen, 2015; Goodman, Kashdan, Mallard, & Schumann, 2014; Lynch, Gander, Kohls, Kudielka, & Walach, 2011) or online mindfulness-based interventions (Cavanagh, Strauss, Forder, & Jones, 2014; Chittaro & Vianello, 2014; French, Golijani-Moghaddam, & Schröder, 2017; Spijkerman, Pots, & Bohlmeijer, 2016).

Furthermore, results of this study have practical implications for parents concerned with their children's weight and eating behaviors (Tylka, Lumeng, Eneli, 2015). Beyond using specific food related parenting practices (Gubbels et al., 2011; Loth, MacLehose, Fulkerson, Crow, & Neumark-Sztainer, 2013; Pearson, Biddle, & Gorely, 2009; Van der Horst et al., 2007), parents may need to become role models for their children modelling mindfulness and adaptive emotion regulation skills by practicing them in their own lives. Taking active steps to teach mindfulness and emotion regulation skills to entire family may be a win-win-win situation (Barber, Bagsby, & Munz, 2010; Quoidbach, Mikolajczak, & Gross, 2015; Parks & Biswas-Diener, 2013; Schueller, Kashdan, & Parks, 2014; Thompson, 1994). Moreover, the data from this study reveals practical applications for school educators. For example, school teaching and non-teaching staff concerned about students' mental health and well-being (Greenberg et al., 2003; Greenberg, Sulkowski, & Lazarus, 2016;

Weissberg, Kumpfer, & Seligman, 2003) may coach mindfulness and adaptive emotion regulation skills at schools (Greenberg & Harris, 2011; Metz et al., 2013) to help children and adolescents develop positive body image and adaptive eating behaviors (Cook-Cottone, Tribole, & Tylka, 2013; Dockendorff, Petrie, Greenleaf, & Martin, 2012; Moy, Petrie, Dockendorff, Greenleaf, & Martin, 2013). Resources on mindfulness and emotion regulation for children and adolescents are currently easily available for parents, educators, counselors, and psychologists (e.g., Christensen, Riddoch, & Eggers Huber, 2009; Eich, 2015; Halliburt & Cooper, 2015; Hayes & Ciarrochi, 2015; Mazza, Dexter-Mazza, Miller, Rathus, & Murphy, 2016; Rathus & Miller, 2014; Swain, Hancock, Dixon, Bowman, 2015; Turrell & Bell, 2016; Willard, 2006, 2016).

Similarly, on college campuses, faculty members and advisers who feel responsible for supporting psychological and emotional well-being of college students (Davidson & Locke, 2010; Douce & Keeling, 2014; Schonert-Reichel, & Lawlor, 2010; Silverman & Glick, 2010; Sulkowski & Lazarus, 2016), may promote intuitive eating behaviors in students (Humphrey et al., 2015) by teaching mindfulness and emotion regulation skills to students (Pistorello, 2013) or by urging them to learn mindfulness and emotion regulation skills using self-help resources available interventions (Cavanagh et al., 2014; Spijkerman et al., 2016).

Implications for Theory

Findings from this study have implications for the acceptance model of *intuitive eating* (e.g., Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Oh et al., 2012). Specifically, although unacceptance coming from other people may potentially threaten individuals' positive *body image* and adaptive *intuitive eating behaviors*, there is little that individuals can do to change other people's attitudes and behaviors such as their criticism and acceptance. However, individuals may change their perceptions of such attitudes as well as acquire a more accepting stance toward their own internal processes. Dispositional *mindfulness*, a predictor of

intuitive eating behaviors examined in this study, may help to create a "shield" against any unflattering comparisons and remarks coming from others or from negative self-evaluations by acquiring a different accepting non-evaluative and non-reactive stance towards such negative or threatening external or internal events. Including *adaptive* and *maladaptive emotion regulation strategies* to the model may also enrich understanding of adaptive *intuitive eating* behaviors. Consistent with previous intuitive eating research in which body appreciation (BAS) was upheld as a mediator in the acceptance model of intuitive eating (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh et al., 2012), results of this study confirm the mediating role of body appreciation (BAS) in the relationship between dispositional mindfulness/emotion regulation skills and intuitive eating behaviors.

In terms of the mindfulness theory, results of this study may shed light on the mechanism through which the ability to focus on what is happening in the present may increase non-judging acceptance of the present moment and promote intuitive eating behaviors (Garland, Farb, et al., 2015a, b; Greeson et al., 2014; Hart et al., 2013; Hölzel et al., 2011; Malinowski, 2008; Shapiro et al., 2006; Vago & Silbersweig, 2012). Moreover, results add evidence to the viewpoint that the development of the mindfulness non-judging quality may be a key mechanism in mindfulness based-interventions (Bishop et al., 2004; Malinowski, 2013; Shapiro et al., 2006). Indeed, according to previous research (Peters, Eisenlohr-Moul, Upton, & Baer, 2013), mindfulness-based interventions that teach acting with awareness and attention skills without also emphasizing the way how to pay attention to internal and external events - i.e., non-judgmentally - may be harmful (Peters, Eisenlohr-Moul, Upton, & Baer, 2013).

Limitations and Suggestions for Future Research

Although this study addressed a significant gap in the adaptive eating literature and contributed to the understanding of factors explaining *intuitive eating* behaviors, it is important to

interpret the findings within the study limitations. First, there are some concerns regarding the generalizability of the study, particularly because the convenience sampling technique was utilized in this study associated with homogeneous nature of the sample instead of random sampling to recruit participants (Jager, Putnick, & Bornstein, 2017; Peterson & Merunka, 2014). For example, the sample consisted of predominantly Caucasian female participants between 18-29 years of age, gathered from a university population in the same rural Midwestern geographic location. Moreover, the participants of this study attended College of Education getting degrees in such areas as aviation and space, health and human performance, teaching, counseling, educational and counseling psychology, and educational leadership. Therefore, it may be difficult to generalize the results from the current study to other populations including college women holding different majors, college men, adolescents of both genders, community members, older age groups, participants of other ethnic and racial backgrounds, participants living and studying in other settings (i.e., urban, rural) and geographical areas nationally and internationally. For example, results of this study cannot be generalized to men because men have been reporting higher intuitive eating (Tylka & Kroon Van Diest, 2013) and lower emotional eating compared to women (Péneau et al., 2013). Results should not be generalized to older women due to higher body appreciation in older women (Tiggemann & McCourt, 2013). Likewise, results from American samples should not be generalized to other samples cross-culturally, and results from rural areas should not be generalized to urban areas, because members of different cultures and different settings (e.g., urban and rural) may have divergent body ideals, and as a consequence hold different attitudes towards their bodies (Swami, Caprario, Tovée, & Furnham, 2006; Swami & Chamorro-Premuzic, 2008; Swami et al., 2010; Swami & Jaafar, 2012; Swami & Tovée, 2005, 2007). For example, in the industrialised Malaysian urban setting, women may feel a conflict between Western notions of individual control over the body and more traditional Eastern humility and kenotic self-abasement (Rieger, Touyz, Swain, & Beumont, 2001; Swami, Kannan, & Furnham, 2012; Swami & Tovée, 2005).

Another reason why results of this study cannot be generalized to other races and ethnical groups is due different dietary habits (e.g., sugar consumption; consumption of highly processed foods) among White, Hispanic, and Black populations (Ervin, Kit, Carroll, & Ogden, 2012; Park et al., 2016; Poti, Mendez, Ng, & Popkin, 2016). Based on the data from the 2007–2010 National Health and Nutrition Examination Survey which estimated state-level self-reported frequency of fruit and vegetable consumption among adolescents and adults, dietary habits appeared to be different across American states (Moore et al., 2015; Moore, Thompson, Demissie, 2017). For example, in Oklahoma, only 8.8% of adult population met or exceeded fruit intake recommendations, and only 5.8% of adult population met or exceeded vegetable intake recommendations. To compare, in New Mexico, 15.3% of adult population met or exceeded fruit intake recommendations, and 9.3% of adult population met or exceeded vegetable intake recommendations (Moore et al., 2015). Thus, for greater generalizability, it is recommended that future research is conducted on a more representative sample including participants of both genders, a wider age range, different races and ethnicities, various college majors, education levels, and geographical areas. Additionally, future research may comprise populations at risk for eating disorders including lesbian, gay, bisexual, and transgender (LGBT) individuals and individuals who identify outside of the restrictive gender binary (Algars, Alanko, Santtila, & Sandnabba, 2012; Feldman & Meyer, 2007; Jones, Haycraft, Murjan, & Arcelus, 2016; Reisner et al., 2016; Strandjord, Ng, & Rome, 2015; Waldron, Semerjian, & Kauer, 2009; Watson, Veale, & Saewyc, 2016).

Possibly the largest limitation of this study is the reliance on a cross-sectional and correlational study design. In other words, causal conclusions cannot be inferred due to the non-experimental data of this study which cannot prove causal hypotheses, make predictions, and generalize the results to diverse samples given that none of the independent variables were manipulated (Warner, 2012). For instance, although high dispositional mindfulness and use of adaptive emotion strategies may theoretically function as promoting factors for intuitive eating

behaviors, it is possible that the tendency to be mindful and to employ adaptive emotion regulation strategies develop in response to positive, calm, and caring stance associated with intuitive eating. Thus, prospective experimental studies are necessary to elucidate the nature and direction of the relationship between these dispositional factors and intuitive eating. Moreover, longitudinal research is needed to investigate whether a causal relationship exists between the practice of mindfulness (Dimidjian & Linehan, 2003a, 2003b; Linehan, 1993a, 1993b; Linehan, 2014a, 2014b; Segal et al., 2002), the resulting cultivation of dispositional mindfulness skills, and corresponding changes in body appreciation and intuitive eating. Likewise, longitudinal studies may be focused on the causal relationship between the practice of adaptive emotion regulation skills (Linehan, 1993a, 1993b; Linehan, 2014a, 2014b), the resulting cultivation of adaptive emotion regulation strategies, and corresponding changes in body appreciation and intuitive eating.

Another limitation of the study is reliance on self- reported behavioral data. Although self-report questionnaires provide meaningful information for clinicians, they can also be biased and subject to social desirability issues. For example, limitations associated with introspection and response biases (i.e., social desirability) commonly associated with self-report data are particularly relevant for the assessment of mindfulness and emotion regulation strategies because mindfulness (Bergomi et al., 2013a; Grossman, 2008) and emotion regulation (Aldao et al., 2010; Koster, Soetens, Braet, & De Raedt, 2008; Selzer, Vinokur, & van Rooijen, 1975; Robinson & Clore, 2002) relies on identifying and reporting one's degree of self-awareness and admitting negative qualities such as being judgmental, reactive, or avoidant. Participants could have responded to questions about mindfulness and use of emotion regulation strategies in certain ways to appear aware, attentive, accepting, open to experiences, and emotionally balanced. Moreover, researchers assessing mindfulness via self-report measures have expressed confusion related to the validity of self-report measures of mindfulness (Bergomi et al., 2013b; Brown et al., 2007; Christopher, Charoensuk, Gilbert, Neary, & Pearce, 2009; Grossman, 2008, 2011; Van Dam, Earleywine & Danoff-Burg,

2009), mainly due to important differences in conceptual definitions of mindfulness (Baer et al., 2006; Brown & Ryan, 2004; Cardaciotto et al., 2008; Grossman, 2008, 2011). Moreover, in this study, dispositional mindfulness was assessed using the five facet mindfulness questionnaire that was analyzed as a unidimensional construct. Measuring unidimensional dispositional mindfulness may be an oversimplification of the mindfulness construct that has been initially conceptualized as a multidimensional construct containing five distinct facets (Baer et al., 2006). An additional limitation pertains to the utilization of a measure of emotion regulation strategies that was created for this study, also noted by other researchers using newly created measures (e.g., Aldao & Dixon-Gordon, 2014; Aldao & Nolen-Hoeksema, 2012b). Consequently, it will be critical to conduct a psychometric study examining the reliability and validity of the scale used in this study assessing the habitual use of emotion regulation strategies. Moreover, the instrument assessing emotion regulation strategies in this study may not capture the whole complexity of the concept of emotion regulation (Campos, Frankel, & Camras, 2004; Cole, Martin, & Dennis, 2004).

Similarly, previous research suggested that assessment of intuitive eating by self-report is associated with report biases (Anderson, Schaumberg, Anderson, & Reilly, 2015). It is possible that while participants may believe that they eat in accordance with satiety or hunger cues, this may not be the case in practice. In terms of social desirability issues, many of the questions on the Intuitive Eating (IES-2) and Body Appreciation (BAS) scales included in this study could be considered sensitive, and therefore, it is plausible that participants could respond in socially desirable ways. Webb, Wood-Barcalow, and Tylka (2015) expressed doubts if self-reports on explicit measures of positive body image match up with implicit measures of positive body image. These authors suggested to complements to traditional self-report measure of positive body image with experience sampling methods (e.g., McKee et al., 2013) and “think-aloud” cognitive assessment paradigms (e.g., Zanov & Davison, 2010) of positive body image qualities.

Although some authors suggested that the greater anonymity associated with self-report

measures may produce more honest responses compared to face-to-face interviews (Keel, Crow, Davis, & Mitchell, 2002; Lavender & Anderson, 2008), alternatives to self-report measures may provide a more realistic measurement of the study variables (Anderson et al., 2015; Baer, 2011; Tylka & Kroon Van Diest, 2013). Namely, future studies should utilize interview-based assessments in conjunction with paper-based measures (Swain et al., 2013), observations of actual behaviors in laboratory and naturalistic settings (e.g., Gross, 1998, Gross & John, 2003; Nolen-Hoeksema et al., 2008), observer externally verifiable reports (Casier et al., 2011), take behavioral/ physical measurements (Heffner et al., 2002) of the study variables (e.g., mindfulness, emotion regulation strategies, intuitive eating), and use experimental designs (Aldao & Nolen-Hoeksema, 2012; Bradley & Lang, 2000) examining whether improvement of dispositional mindfulness and emotion regulation skills through targeted mindfulness and emotion regulation interventions mediates improvements in body appreciation and intuitive eating patterns. Additionally, it is recommended to use other validated self-report mindfulness and emotion regulation measures in further research studies.

Another limitation is related to the assessment of body weight in this study. Specifically, participants' body weight was measured using body mass index (BMI) which has not been designed as an accurate diagnostic tool for determining normal body fat (Wells, Coward, Cole, & Davies, 2002). For example, it is possible that study participants who appeared to be normal weight or overweight according to their body mass index (BMI) (18.5-29.9), were actually obese, which was primarily due to having low levels of lean muscle mass (Etchison et al., 2011). Moreover, there is data suggesting that body mass index (BMI) provides misleading results concerning body fat content in different ethnic groups (Rahman & Berenson, 2011). Specifically, individuals of Asian descent differ from Caucasians and from each other in their body mass index/body fat percent relationship (Carpenter et al., 2013; Chang et al., 2003; Deurenberg, Deurenberg-Yap, & Guricci, 2002; Gurrici, Hartriyanti, Hautvast, & Deurenberg, 1998) suggesting that relying on body-mass index (BMI) to estimate body fat content may misclassify subgroups that appear normally weighted but have excess

body fat. Similarly, some individuals who have a higher body mass index (BMI) due to the increased lean muscle mass, such as well-trained athletes, may have a healthy body fat percentage making them look healthy, muscular, and fit (Garrido-Chamorro, Sirvent-Belando, Gonzalez-Lorenzo, Martin-Carratala, Roche, 2009). Since more sophisticated methods of measuring body fat exist, such as dual energy X-ray absorptiometry (DEXA) and air-displacement plethysmography (ADP) (Jensen, Camargo, & Bergamaschi, 2016; Wells, Coward, Cole, & Davies, 2002), in future research other measures of body fat composition may be used. For example, body fat may be measured by body adiposity index (BAI = ((hip circumference)/((height)$^{1.5}$) − 18), a direct estimate of the percentage of body fat accounting for hip circumference and a person's height without adjusting for gender (Bergman et al., 2011).

With regard to the model, another potential limitation of this study is related to possible model mis-specification. Model misspecification can result in invalid statistical inference when using linear regression. Although body mass index, dispositional mindfulness, adaptive and maladaptive emotion regulation strategies, and body appreciation have been previously studied in the context of eating behaviors, these variables are far from explaining all variation in intuitive eating since the maximum R^2 obtained is .40. The complex nature of intuitive eating presupposes that other variables, such as body acceptance by others (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh et al.,2012), emphasis on body function (Avalos & Tylka, 2006), resistance to adopt an observer's perspective of the body (Augustus-Horvath & Tylka, 2011), family pressure to be thin (Kroon Van Diest & Tylka, 2010), attachment anxiety, restrictive/critical caregiver eating messages, and discrepancy perfectionism (Iannantuono & Tylka, 2012) could account for the variance in intuitive eating. Furthermore, specific emotion regulation strategies were not analyzed in this study, therefore restricting results mainly to two groups of adaptive and maladaptive emotion regulation strategies. In terms of the study covariates, hierarchical regression models in this study did not include other covariates except body mass index (BMI) measuring potential third variables that could relate to

intuitive eating (Petrocelli, 2003). For example, cultural and demographic differences could also influence how a participant related to the responses. These differences include, but are not limited to: race, sex, ethnicity, religion, sexual orientation, or socioeconomic status. Moreover, participants' stress level could also influence their responses. Future research should include these cultural and demographic measures as covariates, particularly given recent research in the area of substance abuse suggesting that impulsivity may better account for the relationship of mindfulness to problematic behaviors (Murphy & MacKillop, 2012).

Finally, results of this study are limited by the statistical methodology. The use of structural equation modeling (SEM, Arbuckle, 2007; Kline, 1998) could provide an advantage over hierarchical regression and mediation analysis (Gu, Strauss, Bond, Cavanagh, 2015), allowing simultaneous examination of direct and indirect relationships among constructs represented by multiple items (Kline, 2011). Specifically, researchers have advocated the use of SEM techniques for assessing mediation (e.g. Preacher & Hayes, 2004). Although previously researchers (Augustus-Horvath, 2008; Avalos & Tylka, 2006) have utilized SEM to explore the model of intuitive eating, they used item parcels instead of multiple scales as indicators of constructs. The problem with this approach is that the item-parceling strategy fails to capitalize on the strength of structural equation modeling. Specifically, structural equation modeling allows researchers to utilize multiple scales to represent constructs of interest and explore the relationships among constructs, not indicators, within the models (Weston & Gore, 2006). Thus, in future research it is recommended to add other measures of the study variables. For example, in order to assess the intuitive eating construct, both, the 23-item Intuitive Eating Scale-2 (Tylka & Kroon Van Diest, 2013) and the 27-item Intuitive Eating Scale (Hawks et al., 2004) may be utilized.

Given the above mentioned limitations, the data should be considered preliminary, and results of this study should be interpreted with extra caution. Mainly, results of this study may be generalizable to college women with similar ethnic and demographic makeup. The results may

provide preliminary suggestions for a large range of adolescent and adult age groups.

Summary

To date the intuitive eating literature has explored only a limited number of variables that have the potential to act as factors promoting intuitive eating behaviors in young women. The results from the present study offer preliminary support for dispositional mindfulness and adaptive emotion regulation strategies as factors promoting intuitive eating for young women with various levels of body appreciation. Moreover, these findings provide suggestions for mindfulness and adaptive emotion regulation intervention to promote the tendencies to engage in intuitive eating behaviors in women with low dispositional mindfulness, frequent use of maladaptive emotion regulation strategies, and low body appreciation.

CHAPTER V

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CHAPTER VI

APPENDIX A

EXTENDED REVIEW OF THE LITERATURE

For most emerging adults, the age range of 18-29 years is marked by unique developmental challenges such as overall psychological instability, reduced parental monitoring and contact, establishment of mature interpersonal and intimate relationships, and transition to adult-type roles (e.g., Arnett, 1998, 2000, 2004, 2007, 2013; Nelson & Barry, 2005). They spend considerably more time with peers and dating partners compared to earlier years (e.g., Grossbard, Neighbors, & Larimer, 2011; Stice, Marti, & Rohde, 2013), actively engaging in identity exploration and formation often related to their physical self-evaluation and self-worth (e.g., Arnett, 2000; Coyne, Padilla-Walker, & Howard, 2013; Fussell & Furstenberg, 2005; Gerstacker, 2010). As college students, emerging adults face high levels of stress and academic demands accompanied by various mental health issues such as anxiety and depression (Baghurst & Kelley, 2014; Beiter et al., 2015; Misra & Castillo, 2004; Smith et al., 2015). Female college students of this age experience higher levels of psychological distress and more mental health problems than their male peers and their non-academic counterparts (Baghurst & Kelley, 2014; Egan & Moreno, 2011; Stallman, 2010), that are often associated with unhealthy disordered eating behaviors such as emotional eating and binge eating (Sulkowski et al., 2011; Wolff et al., 2000) followed by weight gain (Anderson et al., 2003; Butler et al., 2004; Economos et al., 2008), lowered appearance self-esteem, sensitivity to others' opinions, and increased body dissatisfaction

(Cooley & Toray, 2001; Strigel-Moore, Silberstein, Frensch, & Rodin, 1989). Moreover, for female college students, campus life is accompanied by declined diet quality and alcohol consumption, conditions linked to emotional eating, overeating, binge eating, weight gain, and the onset of clinical eating disorders or obesity (e.g., Beukes, Walker, & Esterhuyse, 2010; Cook & Hausenblas, 2011; Costarelli & Patsai, 2012; Sulkowski et al., 2011).

College and university settings create more challenges for emerging adult women as they are confronted by media messages about physical appearance and experience significant influence coming from friends and dating partners to achieve narrow expectations on weight and shape (e.g., Cohen, & Blaszczynski, 2015; Eisenberg et al., 2013; Gillen & Lefkowitz, 2009; Salk, 2011; Tylka & Subich, 2004; Tylka, 2004). While spending time on social networks such as Facebook, watching television, and reading fashion magazines, young women compare their physical appearance (Festinger, 1954) to the appearance of their peers and to the ultra-slender body ideals portrayed by the media (Cohen, & Blaszczynski, 2015; Tylka & Subich, 2004; Walker et al, 2015), feeling pressured to achieve unrealistic expectations for weight and shape (Eisenberg et al., 2013; Keel et al., 2013; Tylka & Subich, 2004). Eventually, they internalize the thin ideal (Bessenoff & Snow, 2006; Kroon Van Diest & Perez, 2013; Thompson & Stice, 2001), adopting an outsider view, treating themselves "as an object to be looked at and evaluated" (Fredrickson & Roberts, 1997, p. 177).

Becoming self-conscious and dissatisfied with their bodies, young women start engaging in disordered eating behaviors such as binge-eating and unhealthy weight regulation behaviors such as vomiting after meals, skipping meals, fasting, dieting, excessive exercise, and use of diet pill and laxatives (e.g., Bessenoff & Snow, 2006; Gilbert, Crump, Madhere, & Schutz, 2009; Keel et al., 2013; McVey et al., 2010; Monro & Huon, 2006; Morry & Staska, 2001; Tylka & Subich, 2004). Ultimately, high level of body dissatisfaction is considered a key element of subclinical disordered maladaptive eating behaviors (e.g., Smolak & Thompson, 2009; Stice & Shaw, 2002; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989; Tylka, 2004). Research findings indicate that over the last

decade more college women have been practicing disordered eating and engaging in purging and non-purging unhealthy weight control behaviors (e.g., Juarascio et al., 2011; Timko & Perone, 2005; Tylka & Hill, 2004; Tylka & Sabik, 2010; White, Reynolds-Malear, & Cordero, 2011). The danger of disordered eating behaviors that do not warrant a diagnosis is that they can set the stage for the development of full blown eating disorders (e.g., Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Stice, 2002b). According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013), eating disorders are serious clinical mental conditions, that are disruptive to the psychological and social functioning, and are difficult to prevent and treat. Given the high rates of disordered eating in young emerging adult women, conducting research relevant for prevention of disordered eating and promotion of adaptive eating behaviors is warranted (e.g., Kroon Van Diest & Perez, 2011; Stice et al., 2013; Wilksch, 2014).

Intuitive Eating

Although eating behaviors exist along a continuum with adaptive, asymptomatic, unrestrained, well-balanced eating behavior on one end and clinical eating disorders on the opposite end with milder forms of disordered eating at an intermediate point (e.g., Mintz & Betz, 1988; Rodin, Silberstein, & Striegel-Moore, 1985; Ricciardelli & McCabe, 2004; Tylka & Subich, 1999, 2002), researchers have been focusing on the pathological end of the spectrum (e.g., Avalos et al., 2005; Phan & Tylka, 2006; Tylka, 2006) paying little attention to protective factors and adaptive attitudes and behaviors in symptom-free individuals (e.g., Crago et al., 2001; Franko et al., 2005;.Tylka & Kroon Van Diest, 2015). Although emphasis on pathology in the field of eating behaviors and focus on interventions within the context of established risk factors constitute important components in prevention of disordered eating behaviors (Piran, 2010, 2015; Stice, Becker, & Yokum, 2013; Stice, Marti, Spoor, Presnell, & Shaw, 2008), in order to enhance holistic understanding of treatment and prevention options, it is equally important to explore what positive psychological processes may protect individuals from eating pathology, as well as help them develop and maintain healthy adaptive

eating habits (e.g., Avalos et al., 2005; Cook-Cottone, 2015; Piran, 2015; Stice et al., 2007; Striegel-Moore & Bulik, 2007; Tylka, 2006).

Intuitive Eating as an Adaptive Eating Behavior

Following fundamental principles of positive psychology emphasizing well-being, strengths, resilience, and health (e.g., Aspinwall & Tedeschi, 2010; Bull, 2008; Gelso & Frets, 2001; Seligman, 2008; Steck et al., 2004), a group of psychologists has shifted research focus to health-related eating behaviors (e.g., Bacon et al., 2005; Gagnon-Girouard et al., 2010; .Tylka, 2006; Tylka et al., 2014; Van Dyke & Drinkwater, 2013), conceptualizing adaptive eating as a separate construct that contains unique components not present in the eating disorder continuum (e.g., Tylka, 2006; Tylka & Wilcox, 2006). Although other adaptive eating behaviors have been identified such as mindful eating (e.g., Albers, 2011; Mathieu, 2009; Moor, Scott, & McIntosh, 2013), research on intuitive eating behaviors is now gaining momentum (e.g., Augustus-Horvath, & Tylka, 2011; Avalos & Tylka, 2006; Tylka, 2006; Tylka & Kroon Van Diest, 2013; Van Dyke & Drinkwater, 2013).

Intuitive eating, is a form of adaptive eating behavior initially popularized by Tribole and Resch (1996), and further researched, conceptualized, and operationalized by Tylka (2006). Intuitive eating is a healthy non-diet form of eating characterized by unconditional permission to eat foods desired at the moment regardless of nutrient or caloric content and not categorizing food as acceptable or nonacceptable, eating in response to physiological hunger and satiety cues rather than in response to emotional reasons such as emotional distress and boredom, and self-trust and a strong and healthy connection with internal physiological hunger and satiety cues (e.g., Tylka, 2006; Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006). Other intuitive eating processes are related to practicing "gentle nutrition" (Tribole & Resch, 1996, p. 207), not avoiding any kind of food and choosing foods that may be enjoyed, giving preference to foods that may enhance health and body functioning,

elevate stamina and levels of energy, and improve body performance (e.g., Tylka & Kroon Van Diest, 2013).

Although intuitive eating is not the opposite of eating pathology, conceptually, intuitive eating may be contrasted to any sort of disordered eating behaviors, but mainly to maladaptive eating patterns such as emotional eating (e.g., Evers et al., 2010; Heatherton & Baumeister, 1991; Spoor, Bekker, Van Strien, & van Heck, 2007; Van Strien et al., 2013), external eating (e.g., Van Strien et al., 1986; Van Strien et al., 2009), and restrained eating (e.g., Brogan & Hevey, 2013; Herman & Polivy, 1980; Lowe & Timko, 2004; Van Strien et al., 1986; Vartanian, Herman, & Polivy, 2006).

Intuitive eating and its correlates. Recent empirical studies have supported adaptive properties of intuitive eating. For example, researchers revealed that intuitive eating is inversely related to maladaptive eating behaviors such as rigid dietary control of food intake (Tribole & Resch, 2012; Tylka & Kroon Van Diest, 2013; Westenhoefer, Stunkard, & Pudel, 1999). Interestingly, intuitive eating is also negatively associated with flexible control of eating behavior, which is often considered a balanced approach to eating, similar to intuitive eating (Meule, Westenhöfer, & Kübler, 2011; Timko & Perone, 2006; Tylka, Calogero, et al., 2015). Recent reviews (Bruce & Ricciardelli, 2016; Van Dyke & Drinkwater, 2014) indicated that individuals who eat intuitively have lower odds of having both disordered eating cognitions and disordered eating behaviors. For example, according to research findings, intuitive eating is negatively associated with negative body image processes such as internalization of the thin ideal, body dissatisfaction, and body surveillance (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Dittmann, Freedman, Beddoe, & Waldrop, 2009; Oh et al., 2012; Tylka, 2006; Tylka & Homan, 2015; Tylka & Kroon Van Diest, 2013). Moreover, studies suggested that individuals who tend to eat intuitively have lower odds of developing disordered eating behaviors and disordered eating symptomatology, such as food preoccupation, binge eating, and bulimia (Denny et al., 2013; Tylka, 2006; Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006; Tylka et al., 2015). Research studies found that intuitive eating is negatively associated with

maladaptive eating behaviors including emotional eating, external eating, and restrained eating, as well as dieting, skipping meals, and other extreme (i.e., smoking, fasting, food supplementation) weight control practices (Camilleri et al., 2015; Denny et al., 2013; Moy et al., 2013; Shouse & Nilsson, 2011; Smith & Hawks, 2006; Tylka, 2006; Tylka & Kroon Van Diest, 2013; Tylka et al., 2015a).

Although it may be argued that intuitive eating and eating disorder symptomatology are opposite poles of the one eating behavior continuum (e.g., Kahan, Polivy, & Herman, 2003; Mintz & Betz, 1998; Polivy & Herman, 1999; Tylka & Subich, 2004), it is important to note that those who eat intuitively are not just asymptomatic (e.g., Tylka, 2006; Tylka & Wilcox, 2006). Indeed, recent empirical research supported intuitive eating's adaptive properties (for review, see Bruce & Ricciardelli, 2015; Van Dyke & Drinkwater, 2014). Empirical evidence suggest that intuitive eating is positively related to multiple indices of psychological health and wellness above and beyond low levels of eating disorder symptomatology (for reviews see Cadena-Schlam, & López-Guimerà, 2015; Tylka et al., 2014; Van Dyke & Drinkwater, 2013). For example, research studies revealed that intuitive eating is positively related to general life satisfaction, optimism, self-esteem, and unconditional self-regard (e.g., Tylka, 2006; Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006), self-compassion (Schoenefeld & Webb, 2013; Shouse & Nilsson, 2011; Stapleton & Nikalje, 2013), and perceived social support (Augustus-Horvath & Tylka, 2011). Studies also demonstrated that intuitive eating positively correlates with individuals' ability to cope with problematic situations in a proactive way (Tylka, 2006; Tylka & Wilcox, 2006) and to engage in social problem solving behaviors (Tylka & Wilcox, 2006).

With regard to positive body image and processes, attitudes, and behaviors related to adaptive eating, research studies indicate that intuitive eating is positively associated with greater resistance in adopting an observer's perspective of the body (Augustus-Horvath & Tylka, 2011; Tylka & Kroon Van Diest, 2013), higher body satisfaction (Dittmann et al., 2009), greater focus on body function

rather than appearance (Avalos & Tylka, 2006; Oh et al., 2012; Tylka & Homan, 2015), higher exercise motivation (Tylka & Homan, 2015), higher interoceptive sensitivity, body responsiveness to body sensations, and body awareness (Dittmann et al., 2009; Herbert et al, 2013; Tylka, Calogero, et al., 2015; Tylka & Kroon Van Diest, 2013), and higher enjoyment and pleasure of food (Smith & Hawks, 2006). A growing body of literature has investigated the positive role of body appreciation in intuitive eating (e.g., Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Oh et al., 2012; Tylka et al., 2015; Tylka & Homan, 2015; Tylka & Kroon Van Diest, 2013).

With respect to its associations with physical health, results of multiple studies demonstrate that intuitive eating is positively related to improved dietary intake and healthy body weight, supporting individuals' physical health (e.g. blood pressure; cholesterol levels, inflammation markers) and accounting for lower body mass index (BMI), especially in young women (e.g., Augustus-Horvath & Tylka, 2011; Denny et al., 2013; Dittmann et al., 2009; Herbert et al., 2013; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Madden et al., 2012; Oh et al., 2012; Schoenefeld & Webb, 2013; Tylka, 2006; Tylka et al., 2014; Tylka et al., 2015; Tylka & Homan, 2015; Tylka & Kroon Van Diest, 2013). Indeed, Avalos and Tylka (2006) suggested that women with lower body weight receive more body acceptance from others, and, therefore, are more likely to appreciate their bodies and to eat more intuitively. Inverse association between intuitive eating and body mass index (BMI) may be explained by the fact that in today's Western culture women with higher body weight frequently internalize the thin ideal (Buote et al., 2011; Thompson & Stice, 2001), are more dissatisfied with their bodies (Conley & McCabe, 2011; Davis, Durnin, & Gurevich, 1993; Girz et al., 2013; Warren, Holland, Billings, & Parker, 2012), are less appreciative of their bodies (Augustus-Horvath & Tylka, 2011; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Tylka & Kroon Van Diest, 2013), and are more likely to use unhealthy weight control methods such as dieting, skipping meals, using laxatives, and fasting (e.g., Costarelli et al.; 2009; Davis et al., 1993; Delinsky

& Wilson, 2008; Girz et al., 2013; McCracken, Jiles, & Blanck, 2007; Stice, 1998; White et al., 2011; Warren et al., 2012).

Importantly, research focused on practical application of intuitive eating, indicated that intuitive eating interventions may significantly decrease cognitive restraint, disinhibition, drive for thinness, diet mentality, body dissatisfaction, body image avoidance, bulimic symptoms, binge eating, and susceptibility to perceptions of hunger, and weight (e.g., Bacon et al., 2002; Bacon et al., 2005; Cole & Horacek, 2010; Gagnon-Girouard et al., 2010; Leblanc et al., 2012; Provencher et al., 2007, 2009), and significantly increasing self-esteem, quality of life, body satisfaction, and interceptive awareness (e.g., Bacon et al., 2002; Bacon et al., 2005; Gagnon-Girouard et al., 2010). Among the non-diet intuitive eating approaches are the original intuitive eating intervention (Tribole & Resch, 2012), the Eat for Life intervention (Bush et al., 2014), the My Body Knows When intuitive eating program (Cole & Horacek, 2010), the Health at Every Size program (HAES; Bacon et al., 2002; Bacon et al., 2005; Carbonneau et al., 2017; Gagnon-Girouard et al., 2010; Humphrey et al., 2015; Provencher et al., 2007; Leblanc et al., 2012), and the Mind, Body, Food web-based weight gain prevention intervention (Boucher et al., 2016).

Conceptualization of intuitive eating. In order to explain the concept of intuitive eating, Avalos and Tylka (2006) proposed the acceptance model of intuitive eating rooted in the positive psychology framework (Seligman & Csikszentmihalyi, 2000) and drawn from humanistic person-centered (Rogers, 1961) and feminist body objectification theories (Fredrickson & Roberts, 1997). The model was later extended in other studies (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Avalos & Tylka, 2006; Kroon Van Diest & Tylka, 2010; Tylka, 2006; Tylka & Wilcox, 2006; Oh et al., 2012). According to this model, several environmental-interpersonal and psychological-intrapersonal factors play an important role in intuitive eating behaviors. The highlighted environmental and interpersonal factors included perceived unconditional acceptance of one's self and one's body by others (e.g., Andrew et al., 2015a; Augustus-Horvath & Tylka, 2011; Avalos &

Tylka, 2006; Kroon Van Diest & Tylka, 2010;.Oh et al., 2012) and general unconditional acceptance (e.g., Avalos & Tylka, 2006; Oh et al., 2012). The psychological and intrapersonal component emphasized the ability to appreciate and take care of one's body and to focus on how one's body functions and feels internally compared to how it may be perceived externally by others (e.g., Andrew et al., 2015a; Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Kroon Van Diest & Tylka, 2010; Oh et al., 2012; Tylka, 2006; Tylka & Homan, 2015). Moreover, Body Mass Index (BMI) was later added to the model (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh et al., 2012).

According this model, women who receive more general unconditional acceptance (Avalos & Tylka, 2006) or social support (Augustus-Horvath & Tylka, 2011) from significant people in their life, are more likely to perceive that their bodies are unconditionally accepted (rather than objectified) by others (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). Likewise, they may be more likely to emphasize how their bodies function and feel internally rather than how they look externally (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). Moreover, focusing on how their bodies function and/or resist observer/s perspective of their bodies, women are more likely to appreciate their bodies, taking care of their needs through intuitive eating behaviors (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Kroon Van Diest & Tylka, 2010; Tylka, 2006; Tylka & Homan, 2015).

Research studies supported the original acceptance model of intuitive eating (Avalos & Tylka, 2006) indicating that for women body appreciation was upheld as a mediator: Body acceptance by others (Andrew et al., 2015b; Augustus-Horvath & Tylka, 2011; Oh et al., 2012), resistance to observer's perspective of the body (Augustus-Horvath & Tylka, 2011), restrictive caregivers' critical messages and attachment anxiety (Iannantuono & Tylka, 2012), as well focus on body function (Avalos & Tylka, 2006; Oh et al., 2012) predicted intuitive eating largely through their negative connection with body appreciation. Results of the studies which tested the model demonstrated that body appreciation was the largest contributor to intuitive eating (e.g., Andrew et al., 2015b; Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Oh et al.,

2012). Other predictors which were found to be in direct association with intuitive eating were attachment anxiety and restrictive/critical caregiver eating messages (Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010), self-objectification (Andrew et al., 2015b), social appearance comparison (Andrew et al., 2015b), resistance to observer's perspective of the body (Augustus-Horvath & Tylka, 2011), and focus on how their bodies function (Avalos & Tylka, 2006; Oh et al., 2012). Moreover, Tylka (2006) suggested that women with lower body mass index (BMI) receive more body acceptance from others and therefore may be more likely to eat intuitively. In line with original research study conducted by Avalos and Tylka (2006), a group authors examining intuitive eating in college women (Augustus-Horvath & Tylka, 2011; Schoenefeld & Webb, 2013) including athletes (Oh et al., 2012), found that women with lower body mass index (BMI) tended to eat more intuitively relying on their internal hunger and satiety cues (Augustus-Horvath & Tylka, 2011; Denny et al., 2013; Oh et al., 2012; Kroon Van Diest & Tylka, 2010; Tylka, 2006; Tylka & Kroon Van Diest, 2013).

Overall, although several social and psychological factors listed above have been examined by researchers as possible predictors of body image appreciation and intuitive eating, it is still unclear what other factors may potentially promote intuitive eating in female college students. Although researchers confirmed that the acceptance model of intuitive eating based on interpersonal acceptance provides a good fit to the data with body appreciation being the strongest predictor of intuitive eating in women belonging to various age groups including emerging adult women (e.g., Andrew et al., 2015a; Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Dittmann et al., 2009; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010; Oh et al., 2012), this model may be expanded by identifying relevant intrapersonal self-regulatory mind–brain–body– behavior processes (Vago & Silbersweig, 2012), which underlie and promote adaptive intuitive eating style and protect against disordered eating behaviors(e.g., Cook-Cottone, 2015).

Psychological Processes Underlying Eating Behaviors

In line with the relatively new movement toward focusing on transdiagnostic conceptualization of mental illnesses that target a core set of psychopathological processes that are common across a wide range of mental health issues and seem to underlie them (e.g., Aldao, 2012; Aldao et al., 2010; Barlow et al., 2010, 2013; Fairburn et al., 2003; Garland & Howard, 2014; Harvey, Watkins, Mansell, & Shafran, 2004; Kring, 2008; Lampard, Tasca, Balfour, & Bissada, 2013), recent advances in psychological science, neuroscience, and mindfulness research suggest that complex cognitive, emotional, and behavior regulation processes underlie eating behaviors (e.g., Anestis et al., 2007; Heron et al., 2014; Masuda et al., 2012). Research findings suggest that processes which reflect how an individual reacts, relates, and interprets, unpleasant external and internal unpleasant or unwanted events (e.g., thin ideal standards promoted by contemporary media; criticism related to body shape coming from peers; negative affect) play a central role in the onset and maintenance of disordered eating (e.g., Aldao et al., 2010; Anestis et al., 2007). Thus, f these processes may be also important for development and maintenance of adaptive eating behaviors.

Mindfulness is the first intrapsychic universal self-regulatory "transtherapeutic" process examined in this study, which may create a perceptual shift resulting in a different relationship with cognitions, emotions and sensations (e.g., Bishop, 2004; Carmody, 2009; Vago, 2014). Indeed, research suggests that mindfulness plays a vital role in mental health and wellness, including the ability to make healthy lifestyle choices (e.g. Brown & Ryan, 2003; Garland, 2011; Greeson et al., 2014). Another "transdiagnostic" process important for healthy eating behaviors, which has been the focus of considerable empirical and theoretical exploration in recent years, is *emotion regulation* (e.g., Aldao, 2013; Aldao & Dixon-Gordon, 2014; Aldao & Nolen-Hoeksema, 2013). Finally, the third process underling intuitive eating is *body appreciation,* a positive holistic bodily representation (e.g., Riva, 2014; Webb, Wood-Barcalow, & Tylka, 2015) with multiple cognitive, emotional, and interoceptive dimensions (e.g., Iannantuono & Tylka, 2012; Tylka, 2013; Tylka & Wood-Barcalow, 2015a; Wood-Barcalow et al., 2010). The current study examined the role of dispositional

mindfulness, adaptive and maladaptive emotion regulation strategies, and body appreciation in intuitive eating behaviors in a sample of college emerging adult women.

Mindfulness

Western science has been increasingly interested in the construct of mindfulness for almost four decades (e.g., Bergomi et al., 2013a, 2013b; Brown & Ryan, 2003; Brown et al., 2007; Feldman et al., 2007; Tran, Glück, & Nader, 2013). Over 500 scientific articles on mindfulness were published in 2012, which exceeded the total number of such articles published between 1980 and 2000 (Shonin, van Gordon, & Griffiths, 2013). Mindfulness, as it is understood in the Western world, is considered to be a difficult concept to define and to operationalize (Davidson, 2010; Brown & Ryan, 2003; Chiesa, 2013; Grossman, 2005, 2008; Williams, 2010). The term mindfulness originates from Eastern introspective psychological practices, specifically Buddhist psychology, which has been using the concept of mindfulness for more than over 2,500 years (e.g., Gunaratana, 2002). Without going into a very detailed description of mindfulness provided in core Buddhist traditional texts that still not very well known in the West (Gethin, 2011; Grossman, 2011; Grossman & Van Dam, 2011; Holas & Jankowski, 2013), it is important to briefly explain the semantic origin of the concept of mindfulness. Mindfulness as a term stems from the word Sati from Pali language, which may be translated into English language as awareness, keen insight and good judgment, retention memory, carefulness, prudence, lucid state of awareness of the present moment, and bare attention (Bodhi, 2011; Grossman & Van Dam, 2011; Shapiro, 2009). Contemporary Western mindfulness researchers and Buddhist scholars have used these and other similar Pali meanings of the word sati to infer that mindfulness means to remember to pay attention to what is occurring in one's immediate experience with care and attention (Bodhi, 2011; Grossman, 2010; Shapiro, 2009; Shapiro & Carlson, 2009; Williams & Kabat-Zinn, 2011).

Although, multiple definitions of mindfulness have been continuously discussed, revised, and clarified in Western literature, today, no consensus about a definition of mindfulness within modern Western psychology exists (Baer et al., 2008; Chiesa, 2013; Chiesa & Malinowski, 2011; Gethin, 2011; Grossman, 2008; Malinowski, 2008). However, a common theme shared in all existing definitions of mindfulness is general receptivity and full engagement with the present moment (Black, 2011). One of the most recognized definition of mindfulness comes from Dr. Jon Kabat-Zinn, a MIT-trained molecular biologist and a founder of the University of Massachusetts Medical School Stress Reduction Clinic ("Kabat-Zinn," n.d.), who defined mindfulness as, “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmental to the unfolding of the experience moment by moment” (Kabat-Zinn, 2003, p.145).

Dispositional mindfulness Although mindfulness may be operationalized as a state, an inherent and enduring trait, and a skill that may be trained through meditation practice or a training intervention (Davidson, 2010; Garland, Geschwind, et al., 2015; Greeson, 2009; Greeson et al., 2014; Keng et al., 2011; Vago & Silbersweig, 2012), the focus of present study is mindfulness as a dispositional or trait like quality of consciousness (Baer et al., 2004; Baer et al., 2006; Brown et al., 2007), also referred to as *dispositional mindfulness*. Dispositional mindfulness (Brown et al., 2007) may be viewed as an inherent metacognitive self-processing capacity of consciousness to identify thoughts and emotions as transient and potentially not valid mental events that can be measured empirically and scientifically (Black 2010; Brown & Ryan, 2003, 2004; Feldman et al., 2007; Hart et al., 2013; Kohls, Sauer, & Walach 2009; Teasdale et al., 2002). Moreover, self-reported dispositional mindfulness appears to be plastic and malleable, and may be significantly enhanced through mindfulness based practices (e.g., Austin, 1998; Carmody & Baer, 2008; Davidson, 2010; Keng et al., 2011), such as meditation (Brown & Ryan, 2003; Crane, Jandric, Barnhofer, & Williams, 2010), Mindfulness-Based Stress Reduction training (Kabat-Zinn, 1990; Kabat-Zinn et al., 1992), Mindfulness-Based Cognitive Therapy (Michalak, Heidenreich, Meibert, & Schulte, 2008; Segal et

al., 2002), Dialectical Behavior Therapy (DBT; Linehan, 1993a, b; Linehan, 2015a, b), and Acceptance and Commitment Therapy (ACT; Hayes et al., 1999). Mindfulness training may be effective even if it lasts only 3 or 4 days (Banks et al., 2015; Creswell, Pacilio, Lindsay, & Brown, 2014; Zeidan et al., 2010; Zeidan, Johnson, Diamond, David, & Goolkasian, 2010).

Importantly, across multiple studies dispositional mindfulness has been related to numerous adaptive outcomes at neurobiological, psychological, and behavioral levels for both clinical and normative populations (Arch & Craske, 2010; Bernstein, Tanay, & Vujanovic, 2011; Bränström et al., 2011; Brown & Ryan, 2003; Brown et al., 2007; Bullis, Bøe, Asnaani, & Hofmann, 2014; Bowlin & Baer, 2012; Coffey & Hartman, 2008; Coffey, Hartman, & Fredrickson, 2010; Keng et al., 2011; Murphy, Mermelstein, Edwards, & Gidycz, 2012; Vago & Silbersweig, 2012). It has been found that mindfulness promotes better functioning (Garland, 2011; Garland & Howard, 2014; Greeson, 2009, 2015; Greason & Cashwell, 2009; Greeson et al., 2014; Pepping, O'Donovan, & Davis, 2013) probably because it facilitates a perceptual shift resulting in a different relationship with cognitions, emotions and sensations (Bishop et al., 2004; Carmody, 2009).

Researchers have claimed that dispositional mindfulness is a universal self-regulatory "transtherapeutic" and "transdiagnostic" process associated with lower levels of psychological distress and psychopathology (e.g., Brown & Ryan, 2003; Greeson, 2009, 2015; Greeson et al., 2014). Dispositional mindfulness has been related to numerous adaptive outcomes at neurobiological, psychological, and behavioral levels, for both clinical and normative populations. In past research, individuals with higher perceived dispositional mindfulness in everyday life (i.e., reporting higher scores on mindfulness measures) have demonstrated higher psychological and physical status (Arch & Craske, 2010; Bernstein, Tanay, & Vujanovic, 2011; Bullis, Bøe, Asnaani, & Hofmann, 2014; Bowlin & Baer, 2012), with lower anxiety, depression, and stress-related symptoms (Cash & Whittingham, 2010; Paul, Stanton, Greeson, Smoski, & Wang, 2013), fewer PTSD symptoms, physical symptoms, and alcohol problems (Christopher, Ramsey, & Antick, 2013; Nitzan-Assayag,

Aderka, & Bernstein, 2015; Smith et al., 2011), and fewer eating disorder attitudes and behaviors (Lavender et al., 2009). High levels of dispositional mindfulness has been associated with lower scores of neuroticism (Fetterman, Robinson, Ode, & Gordon, 2010; Giluk, 2009), difficulties in emotion regulation (Baer et al., 2006; Coffey et al., 2010; Goodall, Trejnowska, & Darling, 2012), cognitive reactivity (Raes, Dewulf, Van Heeringen, & Williams, 2009), experiential avoidance (Baer et al., 2004), and thought suppression (Lavender et al., 2009). Moreover, people who have high levels of self-observed dispositional mindfulness have higher positive affect (Greeson et al., 2014), intrinsic value orientation (Brown & Kasser, 2005), insight, wisdom (Baer et al, 2006), ability to be autonomous (Brown & Ryan, 2003), self-compassion (Baer et al., 2006; Germer, 2009; Hollis-Walker & Colosimo, 2011; Neff, 2003a; Neff, 200), self-acceptance (Carson & Langer, 2006; Gilbert & Proctor, 2006) and experiential acceptance (Curtiss & Klemanski, 2014b; Hayes et al., 2006; Masuda et al., 2012;. Ostafin & Marlatt, 2008), self-regulation (Brown & Ryan, 2003), interpersonal behavior (Dekeyser et al., 2008), and emotional intelligence and emotion regulation including use of adaptive emotion regulation strategies (Baer et al, 2006; Chambers, Gullone, & Allen, 2009; Garland, 2009; Hanley & Garland, 2014; Hill & Updegraff, 2012; Pepping, O'Donovan, Zimmer-Gembeck, & Hanisch, 2014).

Mindfulness mechanisms. Despite growing evidence for the clinical utility of mindfulness, there is considerable debate in scientific circles over its therapeutic mechanism of action (Malinowski, 2008; Garland, Gaylord, & Park, 2009; Holzel et al., 2011). Existing research on mindfulness includes several psychological and neurocognitive theoretical accounts describing specific mechanisms implicated in the state and trait of mindfulness.

Researchers suggested potential mechanisms through which mindfulness may be related to increased wellness (Chambers et al., 2009; Chiesa, Serretti, & Jakobsen, 2013; Coffey & Hartman, 2008; Shapiro et al., 2006; Teper, Segal, & Inzlicht, 2013). Some researchers categorized mindfulness as an adaptive emotion regulation strategy which may alter the way individuals perceive life events by

selecting the information to which to attend (Garland et al., 2010; Garland et al., 2009; Gross, 1998, 2014; Pena-Sarrionandia, Mikolajczak, & Gross, 2015; Prakash, Hussain, & Schirda, 2015), probably because emotion regulation processes have been linked to mindfulness theoretically (Hölzel et al., 2011; Shapiro et al., 2006; Vago & Silbersweig, 2012) and empirically (e.g., Carmody, Baer, Lykins, & Olendzki, 2009; Creswell, Way, Eisenberger, & Lieberman, 2007; Hanley & Garland, 2014; Paul, Stanton, Greeson, Smoski, & Wang, 2013). For example, there is evidence that mindful individuals tend to habitually use more adaptive emotion regulation strategies such as cognitive reappraisal (Hanley & Garland, 2014; Garland et al., 2009; Garland et al., 2010; Shapiro et al., 2006; Vago & Silbersweig, 2012; Zeidan, Martucci, Kraft, McHaffie, & Coghill, 2014) and acceptance (Vujanovic et al. 2010), and less maladaptive emotion regulation strategies such as avoidance (Kumar, Feldman, & Hayes, 2008; Lykins & Baer 2009), thought suppression (Lavender et a., 2009), rumination, and brooding (Cowdrey & Park, 2012).

Consistent with cognitive theory, other researchers focus on the metacognitive information processing underpinnings of mindfulness which is more in conformity with science (Greeson et al., 2014; Jankowski & Holas, 2014; Wells, 2002). Mindful information processing modifies attentional biases by promoting attentional disengagement from cognitive and emotional triggers and reorienting attention to neutral or positive and health promoting stimuli (Gross, 1998; Malinowski, 2013; Thiruchselvam et al., 2012; Vago & Silbersweig, 2012). Recently, several specific components of mindfulness-based processing, that may be contrasted to biased processing of maladaptive habitual scripts and schemas, have been identified, including intention, motivation, attention, exposure, decentering, insight, non-attachment, emotion regulation, body awareness, enhanced mind-body functioning, change in the perspective on the self, extinguishing of biases of attention, extinction of memory distortions, their reconsolidation, prosociality, and integrated functioning (Brown & Ryan, 2003;. Coffey & Hartman, 2008; Holzel et al., 2011; Tang & Posner, 2013; Treanor, 2011; Vago & Silbersweig, 2012).

Authors studying mindfulness as a trait and as a practice have proposed several psychological mechanisms through which mindfulness exerts its salutary effects on various indices of wellbeing (Brown & Ryan, 2003; Brown, Ryan, & Creswell, 2007; Keng et al., 2011; Shapiro, Carlson, Astin, & Freedman, 2006; Raes & Williams, 2010). Several of these accounts expound on the central role of attention in meditation practice (Brown & Ryan, 2003; Carmody, 2009; Lutz, Slagter, Dunne, & Davidson, 2008). Other researchers suggested that several components mediate the beneficial effects of mindfulness practice covering attention, emotion, and self-awareness systems as mediating mechanisms of mindfulness (Guendelman, Medeiros, & Rampes, 2017; Tang et al., 2015). Attention processes have been viewed as the most important in mindfulness (Brown & Ryan, 2003; Carmody, 2009; Grabovac et al., 2011; Holzel et al., 2011; Lutz, Slagter, Dunne, & Davidson, 2008; Shapiro et al., 2006; Tang & Tang 2015a, b; Tang, Hölzel, & Posner, 2015) including modification of attentional biases (Malinowski, 2013; Vago & Silbersweig, 2012), and shift of attention to previously unattended positive contextual data (Garland, Farb, et al., 2015a,b). According to other accounts, mindfulness exerts its effects through self-regulation pathways comprising changes in body awareness, emotion regulation, attention regulation, and perspective of the self (Hölzel, Lazar, Gard, Schuman-Olivier, Vago, & Ott, 2011). A group of authors have focused on specific *information processing* associated with mindfulness that includes disengagement of attention from biased selective processing of habitual scripts and schemas (Farb et al., 2015; Greeson et al., 2014) associated with negative emotionality and use of maladaptive emotion regulation strategies (e.g., rumination; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), moderation of the impact of potentially distressing psychological experience (Shapiro et al., 2006; Vago, & Silbersweig, 2012) resulting in non-reactive orientation toward the contents of experience and experience itself (Desbordes et al., 2015; Holzel et al., 2011; Keng et al., 2011), and reorientation of attention to positive self-promoting beliefs and health promoting stimuli (Boatright & McIntosh, 2008; Malinowski, 2013; Thiruchselvam, Hajcak, & Gross, 2012; Vago & Silbersweig, 2012). Several groups of theorists (Bernstein et al., 2015; Greeson et al., 2014) noted that such processes as reperceiving, decentering, decreased past or future oriented

self-narratives (Garland, Farb, 2015a, b; Shapiro et al.; 2006; Vago & Silbersweig, 2012), self-awareness (Garland, Farb, et al., 2015a,b; Tang & Tang 2015b; Tang et al., 2015; Vago & Silbersweig, 2012), change in perspective on the self (Holzel et al., 2011), and insight (Brown et al., 2007) underlie the beneficial effects of mindfulness.

Others accounts have suggested that mindfulness exerts its effect on indices of wellbeing through enhanced ability to savor and experience reward from positive everyday experiences (Garland et al., 2010; Garland, Farb, et al., 2015a,b; Garland, Geschwind, et al., 2015), and heightened body awareness (Farb et al., 2015; Holzel et al., 2011). Moreover, according to several models, mindfulness works through values clarification (Shapiro et al., 2006) and meaning generation (Garland et al., 2010; Garland & Fredrickson, 2013; Garland, Farb, et al., 2015a,b; Garland, Geschwind, et al., 2015), resulting in enhanced self-regulation and motivation for values-driven behaviors (Shapiro et al., 2006; Vago & Silbersweig, 2012). Finally, Baer and colleagues suggested that positive effects of mindfulness could be explained by several mechanisms of action such as processes related to *observing, describing, acting with awareness, non-judging of inner experiences, and non-reactivity to inner experiences* (Baer et al., 2006; Baer et al., 2008).

Unidimensional and multidimensional mindfulness models. Although attempts have been made to conceptualize mindfulness, originally a Buddhist concept, as a psychological construct, researchers have not reached consensus regarding the structural model of mindfulness (Baer, 2003; Bergomi et al., 2013a, 2013b; Brown & Ryan, 2004; Carmody, 2009; Chiesa, 2013; Dreyfus, 2011; Gethin, 2011; Rapgay & Bystrisky, 2009). While some researchers have a narrow focus suggesting that mindfulness consists of an attention factor alone seeing it as a unified construct (Brown & Ryan, 2003; Carmody, 2009; Lutz, Slagter, Dunne, & Davidson, 2008), others conceive mindfulness as a multidimensional construct which consists of several factors (e.g., two, three, four, or five), but necessarily includes two basic components outlined by Bishop and colleagues (2004), self-regulation of attention and adoption of a non-judgmental and non-reactive orientation to experiences (Baer et al.,

2004; Baer et al., 2006; Bergomi et al., 2013a, 2013b; Cardaciottoet al., 2008; Carmody, 2009; Hofman, Sawyer, Witt, & Oh, 2010;. Hölzel et al., 2011; Kang, Gruber, & Gray, 2013; Lau et al., 2006; Lutz et al., 2008; Shapiro et al., 2006; Tang & Posner, 2013; Vago & Silbersweig, 2012).

Researchers have also explored empirically-based models of mindfulness. For example, according to the model suggested by Baer and colleagues (2006) which has been based on factor analysis of several existing mindfulness questionnaires, mindfulness includes five distinct facets including: 1) *Non-reactivity* (perceiving thoughts/feelings without reacting), 2) *Observing* (paying attention to internal and external sensations), 3) *Acting with Awareness* (staying focused on present moment experience and acting deliberately), 4) *Describing* (describing/labeling thoughts/feelings with words), and 5) *Non-judging* (accepting thoughts/feelings without evaluating them). Baer and colleagues (2006, 2008) indicated that a unidimensional higher order structure of the Five Facet Mindfulness Questionnaire (FFMQ) fitted acceptably only in meditators. In non-meditators, the observing facet had an insufficient fit or appeared unrelated to overall mindfulness (Baer et al., 2006, 2008). Overall, only four mindfulness facets except for the *observing* facet may be considered to be clear indicators of dispositional mindfulness for non-meditators, as the observing facet has the potential to reflect a pathological use of attention (e.g., judgmental), and, therefore, not contribute to an overarching mindful perspective (Baer et al., 2006, 2008; Curtiss & Klemanski, 2014a; de Bruin, Topper, Muskens, Bögels, & Kamphuis, 2012; Lilja et al., 2011; Veehof, Klooster, Taal, Westerhof, & Bohlmeijer, 2011; Williams et al., 2014).

Mindfulness, Body Image, and Eating. Research findings indicate that unidimensional dispositional mindfulness and most of mindfulness facets are significantly and inversely associated with body image related eating disorder cognitions (Adams et al., 2013; Compare, Callus, & Grossi, 2012; Lavender et al., 2009; Lavender et al., 2012; Masuda et al., 2012, Stewart et al., 2004) and disordered eating behaviors (Lavender et al., 2011; Lavender et al., 2009; Masuda et al., 2012).

Furthermore, there is evidence that dispositional moderates the link between disordered eating-related cognitions and disordered eating behaviors (Wendell, Masuda, & Le, 2012).

Mindful information processing. Cognitive and emotional information processing theory (Dobson & Dozois, 2004; Faunce, 2002; Izard, 2007; Lee & Shafran, 2004; Williamson & Muller, 1999; Vitousek & Hollon, 1990) posits that individuals with eating disorders develop maladaptive self-schema regarding social emotional information, appearance, body shape, weight, and eating, and relations to the self, where self-schema is defined as organized cognitive-affective structures which involve dynamic interplay of emotion, appraisals, and higher order cognitions and presumably lead to disturbed information processing (Dobson & Dozois, 2004; Faunce, 2002; Izard, 2007; Markus, 1977). As a result, individuals with eating disorders experience psychological automaticity and mindless inflexibility with a tendency to selectively pay more attention to stimuli related to eating, body shape, and weight and to negatively interpret emotional information (Faunce, 2002; Lee, & Shafran, 2004; Li et al., 2015; Perpina, Hemsley, Treasure, & de Silva, 1993; Vitousek & Hollon, 1990). Such biases in attention and memory to stimuli related to eating, body shape, weight, and social emotional information have been associated with unfavorable self-evaluation and negative body image, rigid cognitive style marked by inflexible dichotomous thinking, (e.g., classifying food into strict categories of "good" versus "bad"), and elevated use of maladaptive avoidant emotion regulation strategies such as dietary restriction and restraint, emotional and binge eating, restrictive eating, purgative behaviors, and excessive exercise (Ainsworth, Waller, & Kennedy, 2002; Fairburn et al., 2003;.Faunce, 2002; Heatherton & Baumeister, 1991; Lee & Shafran, 2004; Shafran, Lee, Cooper, Palmer, & Fairburn, 2007; Williamson et al., 2000; Williamson & Muller, 1999).

Recent findings from cognitive and affective neuroscience research focused on information processing suggest that instead of having negative biases and/or the lack of positive biases related to their bodies and their self-worth, more mindful individuals tend to experience positive affective states more often. pay attention to more positive stimuli, and have improved memory for positive

information, associated with a tendency to have positive interpretational biases allowing them to see themselves and interpret messages from others more positively than less mindful individuals (Clore & Palmer, 2009; Friedman & Förster, 2010; Mathews, 2012; Roberts-Wolfe, Sacchet, Hastings, Roth, & Britton, 2012). From the information processing theory standpoint (see Figure 5), individuals with a mindful processing style marked by metacognitive awareness of their cognitive processes, are able to diminish possibility of experiencing cognitive distortions and biases. Mindful individuals exhibit adaptive cognitive qualities such as cognitive flexibility, open monitoring, monitoring of working memory, response inhibition, and effective emotion regulation, and ability to focus, sustain, and shift attention (Corbetta & Shulman, 2002; Greenberg, Reiner, & Meiran, 2012; Herndon, 2008; Jha, Krompinger, & Baime, 2007; Moore & Malinowski, 2009; Posner & Rothbart, 2007; Vago & Silbersweig, 2012).

Moreover, research findings indicate that individuals with higher levels of dispositional mindfulness experience less deficits in interoceptive processing of internal bodily cues (i.e., including hunger and satiety) linked to heightened awareness of emotional states, which are compromised in individuals with disordered eating behaviors (Bruch, 1978; Farb et al., 2015; Fassino, Piero, Gramaglia, & Abbate-Daga, 2004; Pollatos et al., 2008), especially in women (Garner, 1991; Klabunde, Acheson, Boutelle, Matthews, & Kaye, 2013; Lerner, 1993; Tylka & Hill, 2004). Likewise, mindful individuals experience reduced identification with emotions, thoughts, and body sensations (Bohlmeijer et al., 2011), and have lower behavioral automaticity and impulsivity usually associated with maladaptive eating behaviors (Brown & Ryan, 2003; Kristeller & Wolever, 2011; Levesque & Brown, 2007).

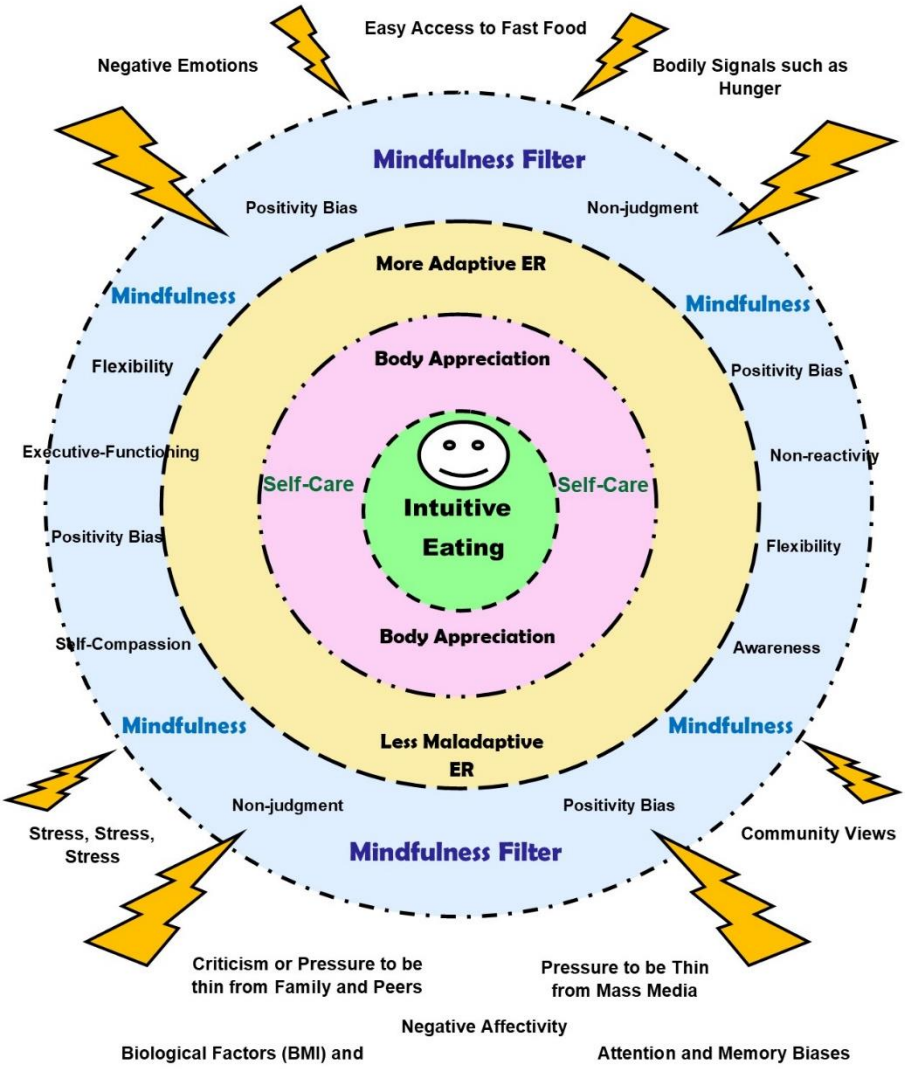

Figure 6. Model of Mindful Information Processing

Dispositional unidimensional mindfulness and eating behaviors. The above mentioned characteristics of dispositional mindfulness have been associated with more adaptive behaviors (Alberts et al., 2012; Jordan et al., 2014) such as healthier eating practices (Beshara et al., 2013; Framson et al., 2009; Jordan et al., 2014; Pidgeon et al., 2013; Sairanen et al., 2015). Specifically, Beshara and colleagues (2013) observed that more mindful individuals reported consuming smaller serving sizes of calorie-dense foods. Pidgeon and colleagues (2013) demonstrated that more mindful community members were more aware of healthy dietary practices and had lower tendency to

consume food in response to negative emotional experiences. Jordan and colleagues (2014) found that college students with higher levels of dispositional mindfulness reported less uncontrolled eating, reduced calorie consumption and greater likelihood of choosing fruit rather than sweets as a snack in an experimental eating task. In addition, Jordan and colleagues (2014) provided experimental evidence that dispositional mindfulness causally affects eating behavior. When participants received a brief mindfulness induction without any reference to food or eating behavior, they consumed fewer calories. Taken together, these results provide strong evidence that higher levels of dispositional mindfulness may facilitate healthier eating.

Research studies revealed that individuals with lower levels of mindfulness tend to experience symptoms of bulimia and anorexia (Adams et al., 2012; Lavender et al., 2009; Lavender et al., 2011; Prowse et al., 2013), binge eating (Compare et al., 2012; Levin et al., 2014; Roberts & Danoff-Burg, 2010), external eating and uncontrolled eating (Lattimore et al., 2011; Ouwens et al., 2015; Tak et al., 2015), and emotional eating (Lattimore et al., 2011; Levin et al., 2014; Ouwens et al., 2015; Pidgeon et al., 2013; Tak et al., 2015). For example, Lavender and colleagues (2009) conducted a study examining the role of dispositional mindfulness and the theoretically opposing construct of chronic thought suppression in bulimic symptoms among undergraduate women and men. Results of a series of hierarchical regression analyses revealed that mindfulness as well as thought suppression accounted for unique variance in bulimic symptoms both in women and men after accounting for body mass index (BMI). Similarly, Masuda and colleagues (2012) found that for undergraduate women and men, the positive association between disordered eating cognitions and disordered eating behaviors are dependent on levels of dispositional mindfulness, suggesting that if young women and men with disordered eating cognitions also more mindful in their everyday life, they are less likely to practice disordered eating behaviors. Furthermore, study conducted by Lattimore and colleagues (2011) in a sample of female college students and women from the local community provided evidence that dispositional mindfulness negatively correlated with emotional

eating and uncontrolled eating reflecting behavioral tendencies to overeat guided by emotions and responsiveness to food cues. When positive association between participants' symptoms of anxiety and depression were controlled, dispositional mindfulness accounted for unique variance in uncontrolled eating (tendencies to be over responsive to food cues) (Lattimore et al., 2011). In cases when individuals may benefit from restricting their food intake, higher levels of dispositional mindfulness may be associated with restrained eating may. For example, more mindful adults with morbid obesity who are candidates for bariatric surgery and adults with type 1 and type 2 diabetes (Ouwen et al., 2015; Tak et al., 2015) are more successful at staying away from binge eating and controlling their food intake.

Facets of multidimensional dispositional mindfulness and eating behaviors. In terms of associations between separate facets of mindfulness (e.g., *non-reactivity to inner experiences*, *observing, acting with awareness*, *non-judging of inner experiences*, *describing*) and disordered eating behaviors, a number of researchers applied hierarchical regression analyses to examine relationship and unique contribution of mindfulness facets to the variance in eating behaviors over and above the variance explained by covariates (e.g., Lavender et al., 2011; Levin et al., 2014; Prowse et al., 2013;. Tak et al., 2015). Consistent with Baer and colleagues (2006), who suggested that unlike other facets, the *observing* mindfulness facet may predict positive psychological outcomes only in individuals experienced in meditation, recent research findings indicate that specific mindfulness facets are uniquely related to lower disorder eating behaviors, whereas other facets are not associated or have a positive relationship with these symptoms. (e.g., Adams et al., 2012; Lavender et al., 2011; Tak et al., 2015).

For example, results indicated that greater mindfulness on specific facets, particularly the *acting with awareness* mindfulness facet was related to lower bulimic and anorexic symptoms (Adams et al., 2012; Lavender et al., 2011; Prowse et al., 2013), fewer episodes of binge eating (Compare et al., 2012), rapid overeating (Levin et al., 2014), emotional eating (Lattimore et al., 2011;

Levin et al., 2014; Tak et al., 2015), uncontrolled "external type" eating (Lattimore et al., 2011), lower number of subjective binge episodes (Levin et al., 2014). One study revealed that *acting with awareness* was unrelated to restrained eating (Tak et al., 2015). Furthermore, the majority of research findings indicated that mindfulness *non-reactivity* facet was associated with less emotional eating (Lattimore et al., 2011; Levin et al., 2014), lower symptoms of bulimia and anorexia (Lavender et al., 2011), fewer episodes of binge-eating (Compare et al., 2012), and uncontrolled "external type" eating being guided by food cues (Lattimore et al., 2011). Interestingly, two sources pointed out that *non-reactivity* positively accounted for unique variance in restrained eating (Tak et al., 2015) and rapid overeating (Levin et al., 2014). Others provided evidence that *non-reactivity* may be unrelated to disordered eating behaviors, for example to behaviors typical for anorexia and bulimia (Adams et al., 2012), emotional and external eating (Tak et al., 2015). Along with the *acting with awareness* facet, the *non-judging* facet is another mindfulness facet important for eating behaviors. Several research studies provided evidence that *non-judging* is related to lower levels of disordered eating behaviors, such as typical bulimic behaviors (Adams et al., 2012), symptoms of bulimia and anorexia (Adams et al., 2012; Lavender et al., 2011; Prowse et al., 2013), uncontrolled "external type" of eating (Lattimore et al., 2011), and emotional and restrained eating (Tak et al., 2015). However, some findings indicated that *non-judging* was unrelated to external eating (Tak et al., 2015) and binge eating (Compare et al., 2012). One study revealed an unanticipated finding, suggesting that *non-judging* may be related to more episodes of rapid overeating (Levin et al., 2014).

Further, mindfulness *describing* facet has been found to be negatively associated with bulimic symptoms (Adams et al., 2012), Describing was related to lower bulimic symptoms (Adams et al., 2012), fewer episodes of binge eating (Compare et al., 2012), greater describing was related to fewer episodes of emotional eating (Levin et al., 2014; Tak et al., 2015). Another group of authors revealed that the *describing* facet is unrelated to external and restrained eating (Tak et al., 2015) and to anorexic symptoms (Adams et al., 2012). Finally, few authors reported that *describing* was positively

associated with eating pathology, such as bulimic and anorexic symptoms (Lavender et al., 2011). Finally, recent research findings have provided evidence that the *observing* facet was unrelated to disordered eating such as symptoms of anorexia and bulimia (Lavender et al., 2011), binge eating (Compare et al., 2012), emotional eating (Lattimore et al., 2011; Tak et al., 2015), and external eating (Tak et al., 2015), while other studies demonstrated that *observing* was related to greater eating problems, positively correlating with uncontrolled eating and restrained eating (Lattimore et al., 2011), predicting symptoms of anorexia and bulimia (Prowse et al., 2013) and significantly and positively accounting for unique variance in reported behaviors associated with anorexia (Adams et al., 2012), significantly and positively accounting for unique variance in restrained eating (Tak et al., 2015), rapid overeating (Levin et al., 2014), and subjective binge episodes (Levin et al., 2014).

Mindfulness-based interventions and disordered eating. It is also important to acknowledge that dispositional mindfulness may be enhanced by mindfulness-based interventions well suited for population with disordered eating behaviors and weight management problems (see reviews Baer et al., 2005; Godfrey et al., 2015; Godsey, 2013; Katterman et al., 2014; O'Reilly et al., 2014; Wanden-Berghe, Sanz-Valero, & Wanden-Berghe, 2011), particularly if they include mindful eating exercises or focus on eating behaviors (Albers, 2011; Alberts et al., 2012; Courbasson, Nishikawa, & Shapira, 2011; Kristeller & Wolever, 2011; Kristeller et al., 2013; Smith, Shelley, Leahigh, & Vanleit, 2006; Steinberg, 2010). It has been found that several mindfulness based therapies may be particularly helpful with disordered eating behaviors and symptoms of eating disorders. Among such therapies are Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn et al., 1992; Williams, 2006), Mindfulness-Based Cognitive Therapy (MBCT; Segal et al., 2002; Williams et al., 2008), Dialectical Behavior Therapy (DBT; Linehan, 1993a, b; Linehan, 2015a, b), and Acceptance and Commitment Therapy (ACT; Hayes, 2004; Hayes et al., 1999; Hayes et al., 2006).

A series of theoretical and empirical papers have been published suggesting that Acceptance and Commitment Therapy (ACT) might be a particularly beneficial treatment for eating pathology

including negative body image (Mandavia et al., 2015; Pearson, Follette, & Hayes, 2012; Sandoz & DuFrene, 2014), disordered eating behaviors, and symptoms of eating disorders (Baer et al., 2005; Hayes & Pankey, 2002; Heffner, Sperry, Eifert, & Detweiler, 2002; Hill, Masuda, Melcher, Morgan, & Twohig, 2015;.Juarascio et al., 2013; Juarascio, Forman, & Herbert, 2010; Manlick, Cochran, & Koon, 2013; Walloch, Cerezo, & Heide, 2012; Wilson, 2004). Furthermore, Acceptance and Commitment Therapy (ACT) has been effective for problematic eating behaviors such as emotional eating (Hill, Masuda, Moore, & Twohig, 2015) and cravings (May, Andrade, Kavanagh, & Hetherington, 2012; Schumacher, Kemps, & Tiggemann, 2017). Research findings suggest that Dialectical Behavior Therapy (DBT; Linehan, 1993a, b; Linehan, 2015a, b) may be another effective treatment for eating pathology (Chen, Matthews, Allen, Kuo, & Linehan, 2008; Robinson & Safer, 2010; Safer & Jo, 2010; Telch, Agras, & Linehan, 2001).

Another mindfulness-based intervention recently used to treat disordered eating behaviors (Baeret al., 2005; Caldwell et al., 2012) is *mindful eating.* Mindful eating has been specifically applied to eating behaviors in order to reduce food consumption and to lose weight (e.g., Albers, 2011; Framson et al., 2009; Kristeller, 2007; Kristeller et al., 2013). Mindful eating has been defined as the "process of being more aware of and less reactive to distressing thoughts about food, body and shape, and overwhelming emotions about food" (Albers, 2011, p.98). Mindful eating practice (Albers, 2003, 2008, 2009; 2014) has been adapted from mindfulness-based exercises from a variety of texts (Kabat-Zinn, 1990; Tapper et al., 2009; Hayes & Smith, 2005).

Key components of mindful eating (Kabat-Zinn, 1990; Proulx, 2008) include: a) tasting food; b) attending to self and body in an experiential way; c) being in-the-moment; d) letting go of thoughts rather than clinging to them; e) acceptance of food, hunger, and self/body image; and f) compassionate and nonjudgmental attitude (Albers, 2011). Mindful eating also means to be attentive and in-the-moment with internal emotions, thoughts, and sensations (i.e., sensation of taste, awareness of satiety cues, cognition, and emotions associated with eating), as well as the external

sensations associated with eating (Andersen, 2007). Research evidence indicates that mindful eating interventions may be used to teach individuals to adopt healthier eating behaviors (e.g., Baer et al., 2005; Caldwell et al., 2012), by diminishing emotional eating, binge eating, and external eating behaviors (Alberts et al., 2012; Godfrey et al., 2015; Katterman et al., 2014; O'Reilly et al., 2014). Mindfulness-based eating awareness training (MB-EAT; Kristeller & Wolever, 2011) is another approach focused on self-efficacy and sense of control around eating, aimed to cultivating self-acceptance, and to reduce frequency of binge episodes. MB-EAT curriculum includes training in mindfulness meditation and guided mindfulness practices that are designed to control maladaptive responses to emotional states, make better food choices, and develop understanding of hunger and satiety cues.

Mindfulness and intuitive eating. Although a vast amount of research studies examined the contribution of unidimensional and multifaceted dispositional mindfulness (Baer et al., 2006) to disordered eating behaviors (Adams et al., 2012; Beshara et al., 2013; Compare et al., 2012; Lavender et al., 2011; Prowse et al., 2013), the role of mindfulness in intuitive eating it is not clear. Until today, only one study has investigated the role of dispositional mindfulness facets measured by the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) in intuitive eating behaviors. Specifically, Sairanen and colleagues (2015) examined the extent to which each mindfulness facet individually contributed to the variance of three separate intuitive eating factors (IES; Tylka, 2006), while controlling for psychological flexibility. The study revealed that with the exception of the mindfulness *observing* facet, each other mindfulness facet uniquely contributed to the variance in intuitive eating when they were examined separately. The *observing* facet did not correlate on its own with any intuitive eating factors apart from the Reliance on Hunger and Satiety Cues subscale of intuitive eating. Schoenefeld and Webb (2013), examined the relationship between intuitive eating and self-compassion, a construct closely related to mindfulness. Schoenefeld and Webb (2013)

suggested that use of self-compassion may help individuals to accept their internal unpleasant experiences fostering their intuitive eating abilities.

Furthermore, two intuitive eating programs including some sort of mindfulness in their curricula have been identified. For example, Bush and colleagues (2014), conducted a study examining the efficacy of the workplace wellness Eat for Life program for problematic eating behaviors and body dissatisfaction in female university employees. The program combined daily mindfulness practice, eating meditations, and lectures on mindful eating targeted to enhance participants' intuitive eating abilities. Bush and colleagues (2014) suggested that individuals should practice mindfulness to gain better awareness of their internal cues. Authors revealed that dispositional mindfulness served as a partial mediator of change in disordered eating behaviors, concluding that mindfulness may be a beneficial component of prevention programs designed to promote adaptive eating.

Given the importance of examining psychological processes underlying intuitive eating behaviors and considering the empirical evidence on the role of dispositional mindfulness in disordered eating behaviors (e.g., Adams et al., 2012; Lavender et al., 2009; Masuda et al., 2012; Tak et al., 2015), which suggests that higher levels of dispositional mindfulness may be associated with holistic "therapeutic lifestyle changes" (Walsh, 2011) including healthy eating behaviors (Beshara et al., 2013; Jordan et al., 2014; Pidgeon et al., 2013), the present study was designed to fill the gap in literature examining the contribution of unidimensional and multidimensional mindfulness to intuitive eating behaviors.

Emotion Regulation

Emotion regulation is a second "transdiagnostic process" (Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2010, 2012b; Gross & Thompson, 2007, Charland, 2011; Choate-Summers, 2011; Dillon, Deveney, & Pizzagalli, 2011; Kring & Sloan, 2009) that includes characteristics underling numerous,

often co-occurring forms of psychopathology (Gross & Jazaieri, 2014; Jazaieri, Urry, & Gross, 2013; Nolen-Hoeksema & Watkins, 2011). *Emotion regulation* has been defined as a higher order multifaceted feature of emotional functioning that involves a range of dynamic processes (Gross, 1998b, Gross & Thompson, 2007; John & Gross, 2004), activities, skills, or approaches (Brans, Koval, Verduyn, Lim, & Kuppens, 2013; Koole, 2009; Ochsner & Gross, 2007; Parkinson & Totterdell, 1999), allowing individuals to monitor and manage their emotional responses and experiences, maintain desirable emotional states, and terminate undesirable emotional states in order to pursue their goals (Cole et al., 2004; Gross 1998, John & Gross, 2004; Tamir, 2009; Tamir & Ford, 2009; Tamir, Ford, & Gilliam, 2013; Tamir, Mitchell, & Gross, 2008; Thompson, 1994). According to one of the most influential process model of emotion regulation (Gross, 1998a; Gross & Thompson, 2007), emotion regulation involves "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998b, p. 275). Recent advances in the field of emotion regulation suggest that the ability to regulate emotions in an adaptive and effective way may be critical for psychological and physical health, wellbeing, and resilience (Barber, Bagsby, & Munz, 2010; Beasley, Ford & Mauss, 2014; Berking et al., 2012; Berking & Wupperman, 2012; Berking, Orth, Wupperman, Meier, & Caspar, 2008; Côté, Gyurak, & Levenson, 2010; Troy & Mauss, 2011; Tugade & Fredrickson, 2007). Emotion regulation may contribute to intuitive adaptive eating style as much as it is believed to underlie disordered eating behaviors among other psychopathological conditions (Aldao et al., 2010; Fairburn et al., 2003; Heatherton & Baumeister, 1991; Stein et al., 2007; Svaldi, Griepenstroh, et al., 2012).

Importantly, researchers view emotion regulation not only as an intrapersonal phenomenon (Campos, Walle, Dahl, & Main, 2011; Cole, 2014; Thompson, 2011), but also a relational process. Various theoretical approaches consider relational aspects in emotion regulation, including the recent contextual approach to clinical research on emotion regulation processes (Aldao, 2013; Aldao,

Sheppes, G., & Gross, 2015; Gross, 2015a, 2015b; McRae, Ciesielski, & Gross, 2012; Troy, Shallcross, & Mauss, 2013), and other theoretical perspectives, such as the developmental systems theory (Gottlieb, Wahlsten, & Lickliter, 2006), cross-cultural approach (De Leersnyder, Boiger, & Mesquita, 2013; Grossmann & Kross, 2010), theories of "situated" cognition and emotions (Griffiths & Scarantino, 2009; Wilson & Clark, 2009), and critical neuroscience perspective (Gallagher, Hutto, Slaby, & Cole, 2013; Slaby, 2012; Slaby & Gallagher, 2015). Indeed, research findings underscore that various environmental factors play an important role in shaping emotion regulation skills throughout the lifespan, including culture (Cole & Tan, 2006; De Leersnyder et al., 2013; Grossmann & Kross, 2010; Su, Lee, & Oishi, 2013), societal norms (Helm, 2001; Slaby, Katz, Kühnberger, & Stephan, 2006), childhood experiences such as childhood abuse (Burns, Fischer, Jackson, & Harding, 2012; Gratz, Bornovalova, Delany-Brumsey, Nick, & Lejuez, 2007), family context and interparental relationships (Fosco & Grych, 2013; Katz & Gottman, 1997; Koss et al., 2011; Morris, Silk, Steinberg, Myers, & Robinson, 2007), parenting practices such as parents' emotion-focused communication skills (e.g., emotion coaching) (Fivush, 2007; Katz, Maliken, & Stettler, 2012; Ramsden & Hubbard, 2002), and teachers' ability to address their own emotions and to influence students' emotion regulation development (Pincus & Friedman, 2004; Zimmerman & Lebeau, 2003). For adolescents and adults, social and social support may be crucial for their emotion regulation (Aldao & Dixon-Gordon, 2014; Marroquín, 2011; Spangler & Zimmermann, 2014).

Emotion Regulation Strategies

Psychologists agree that individuals may flexibly use various emotion-regulation strategies as means of increasing, maintaining, or decreasing duration and/or intensity of emotions (Gross, 1998, 2001; Gross & Thompson, 2007; Gross & Jazaieri, 2014; Farb, Anderson, Irving, & Segal, 2014; Koole, 2009; Parkinson & Totterdell, 1999; Tamir, 2009, 2011). Often individuals use emotion regulation strategies that involve implicit, largely automatic, and nonconscious processes (Bargh & Williams, 2007; Christou-Champi, Farrow, & Webb, 2015; Fiori, 2009; Gyurak, Gross, & Etkin,

2011; Koole, 2009; Mauss, Bunge, & Gross, 2007, 2008), happing without subjective awareness and conscious intention (Bargh & Gollwitzer, 1994; Bargh & Ferguson, 2000). However, bringing more conscious reflection and awareness to the process of emotion regulation, individuals may make conscious and controlled choices of specific emotion regulation strategies (Chaiken & Trope, 1999; Moon & Lord, 2006; Schneider & Shiffrin, 1977a, 1977b), making emotion regulation more goal directed and appropriate for particular environmental contexts (Aldao, 2013; Aldao & Nolen-Hoeksema, 2012b; Bonanno & Burton, 2013; Katzir & Eyal, 2013; Mauss & Tamir, 2013; Sheppes, Catran, & Meiran, 2009; Sheppes & Levin, 2013; Tamir, Chiu, & Gross, 2007; Webb, Miles, & Sheeran, 2012). For example, a female college student may choose either to suppress or avoid her negative emotions when she is with her peers, or select to express, accept, and reappraise the same emotions when she is with supportive family members (English & Carstensen, 2014). According to the process model of emotion regulation (1998a; Gross & Thompson, 2007), depending on the circumstances, conscious intrapsychic cognitive processes easily unnoticed by others (i.e., covert strategies such as cognitive reappraisal or rumination) as well as some overt behaviors (i.e., overt strategies such as behavioral avoidance, eating, problem solving, spending time outdoors) may function as emotion regulation strategies (Aldao & Dixon-Gordon, 2014; Gross, 1998; Gross & Thompson, 2007; Johnsen, 2011; Koole, 2009; Parkinson & Totterdell, 1999).

Another key point is that all emotion regulation strategies may be functionally differentiated into adaptive and maladaptive strategies purportedly based on their ability to encourage behaviors which would promote health and wellness (Aldao & Christensen, 2015) or increase risk for mental and physical illness (Aldao & Nolen-Hoeksema, 2010, 2011, 2012; Aldao et al., 2010; Gross, 1998b; Thompson, 2011; Kring & Sloan, 2009; Nolen-Hoeksema & Aldao, 2011; Parkinson & Totterdell, 1999; Werner & Gross, 2010). Moreover, adaptiveness and maladaptiveness of almost all emotion regulation strategies is putative, and may vary depending upon the situational context (Aldao & Dixon-Gordon, 2014; Aldao & Nolen-Hoeksema, 2012a; Bonanno, Papa, O'Neill, Westphal, &

Coifman, 2004) and their immediate effects on affect, behavior, and cognition, which show whether a particular strategy was effective in helping the individual to meets particular goals (Gross & Thompson, 2007; Thompson, 2011).

Outcomes of adaptive vs. maladaptive emotion regulation strategies. Although adaptiveness and maladaptiveness of almost all emotion regulation depends on the context, over the years, strategies such as cognitive reappraisal, problem solving, and acceptance have been considered putatively adaptive due to their link to positive adaptive outcomes, including health and well-being, social attitudes, effective interpersonal relationships, and improved academic and work performance (English & John, 2013; Goldin, McRae, Ramel, & Gross, 2007; Gross & John, 2003; Haga, Kraft, & Corby, 2009; Lebowitz & Dovidio, 2015; McRae, Jacobs, Ray, John, & Gross, 2012; Mikolajczak, Tran, Brotheridge, & Gross, 2009; Nyklíček, Vingerhoets, & Zeelenberg, 2011; Richards & Gross, 2000; Saxena, Dubey, & Pandey, 2011). On the other hand, strategies like self-criticism, rumination, mental distraction or suppression of unwanted thoughts, expressive suppression of unwanted emotions, and behavioral avoidance and distraction of unpleasant emotions have been classified as maladaptive, because they have been linked with a number of psychological problems and disorders (Aldao et al., 2010; Chawla & Ostafin, 2007; Donaldson & Lam, 2004; Gross & John, 2003; Harris, 2001; Hayes, Strosahl, & Wilson, 1999;.Hong, 2007; John & Gross, 2004; Lyubomirsky & Tkach, 2004; Nezlek & Kuppens, 2008; Richards, 2004; Richards, Butler, & Gross, 2003; Wenzlaff & Wegner, 2000).

As an illustration of adaptive emotion regulation, individuals may engage in generating positive interpretations or perspectives on a stressful situations or unpleasant events in order to reduce negative emotions employing cognitive *reappraisal* (Aldao et al., 2010; Gross, 1998; 2014; Gross & John, 2003; Lazarus & Folkman, 1984). They may stay open to internal experiences and show willingness to remain in contact with these experiences using *acceptance* (Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2013; Gratz & Roemer, 2004; Kohl, Rief, & Glombiewski, 2012; Roemer,

Orsillo, & Salters-Pedneault, 2008). Finally, when individuals make conscious attempts or take actions in order to change a stressful situation or modify its consequences, they are using *cognitive (overt) and behavioral (covert) problem-solving* strategies (Carver et al., 1989; D'Zurilla & Goldfried, 1971; Billings & Moos, 1981; Svaldi, Dorn, & Trentowska, 2011). In contrast, emotions regulation is considered maladaptive when individuals engage in constant and harsh self-evaluation using *self-criticism* (Blatt, 1995; Dunkley & Grilo, 2007; Kelly & Carter, 2013; Anderson, Miller, Riger, Dill, & Sedikides, 1994), or focus and think perseveratively on unpleasant experience, its causes and consequences, using *rumination* (Hong, 2007; Lyubomirsky & Tkach, 2004; Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003). They may make efforts to avoid or suppress unpleasant cognitions, employing *thought suppression and mental distraction* (Erskine & Georgiou, 2010; Oliver & Huon, 2001; Wenzlaff & Wegner, 2000), or suppress and hide experience and behavioral expression of emotions, using *expressive suppression* (Aldao et al., 2010; 2010; Chawla & Ostafin, 2007; Donaldson & Lam, 2004; Gross & John, 2003; Harris, 2001; Hayes et al, 1999; John & Gross, 2004; Nezlek & Kuppens, 2008). Individuals may also avoid situations related to unpleasant events or engage in activities in order to distract themselves from these situations using *behavioral avoidance and distraction* (Aldao & Dixon-Gordon, 2014; Baker, Piper, McCarthy, Majeski, & Fiore, 2004; Wolgast, Lundh, & Viborg, 2013).

Role of Emotion Regulation in Eating Behaviors

Emotion regulation theories suggest that negative affective states and lack of skills required to adaptively and effectively cope with negative emotions play a very important role in disordered eating behaviors (Baumeister, 1990; Heatherton & Baumeister, 1991; Polivy & Herman, 1993). According to these theories, individuals use eating to escape from negative affect and to provide short term distraction from aversive self-awareness through narrowing cognitive attention (Blackburn et al., 2006; Heron et al., 2014; Macht, 2008; Meyer et al., 1998; Wild et al., 2007). From the neuroscience

perspective, the neural bases of negative emotions overlap with those underlying the regulation of food cravings (Buhle et al., 2014; Giuliani, Mann, Tomiyama, & Berkman, 2014). Individuals with disordered eating behaviors often have deficits in interoceptive awareness, making it hard for them to differentiate between negative emotions and hunger cues. This lack of differentiation may cause binging or overeating in such individuals (Giuliani & Berkman, 2015). Likewise, when individuals with eating disorders are unable to reduce emotional states, they habitually use disordered eating behaviors (e.g., binge eating) an attempt to seek temporary relief from negative emotions (Deaver, Miltenberger, Smyth, Meidinger, & Crosby, 2003; Evers et al., 2010). Moreover, literature suggests that restrictive, emotional, and disinhibited eating behaviors in healthy individuals may have a function of maladaptive emotion regulation strategies, limiting their use of more adaptive emotion regulation strategies (Brockmeyer et al., 2012; Danner, Evers, Stok, Elburg, & Ridder, 2012; Evers et al., 2010; Fox & Power, 2009; Haynos & Fruzzetti, 2011; Leehr et al., 2015; Wildes, Ringham, & Marcus, 2010).

It is noteworthy that individuals with eating disorders often choose strategies that are not a priori maladaptive (e.g., eating or mental distraction), but become maladaptive because they are linked to affect-biased attention allocation *towards* and difficulty in disengagement *from* contextually self-relevant stimuli (e.g., fear of fatness for eating disorders disorders) and resulting in distortions in information processing (e.g., she hates me because I am fat) (Harrison et al., 2010; Vago & Silbersweig, 2012). Overall, negative emotions and maladaptive emotion regulation are considered important maintenance factors in eating disorders (Alpers & Tuschen-Caffier, 2001; Aldao et al., 2010; Harrison et al., 2010).

Emotion regulation strategies and disordered eating behaviors. Recent research suggests that healthy individuals and individuals with eating disorders differ in their habitual preference for specific emotion regulation strategies (Brockmeyer et al., 2014; Harrison, Sullivan, Tchanturia, & Treasure, 2010a; Harrison, Tchanturia, & Treasure, 2010b; Kittel, Brauhardt, & Hilbert, 2015;

Lavender et al., 2014). Specifically, compared to heathy controls, individuals with eating disorders are often unable to choose appropriate adaptive strategies to alleviate aversive emotional states, experiencing different difficulties in their emotion regulation and rigidly using maladaptive emotion regulation strategies (e.g., Brockmeyer et al., 2012; Brockmeyer et al., 2014; Harrison et al., 2009; Wolz et al., 2015). Similarly, research findings revealed that among college men and women, emotion regulation difficulties including limited access to adaptive emotion regulation strategies and rigid use of maladaptive emotion regulation strategies accounted for significant variance in disordered eating behaviors over and above body mass index (BMI), negative affect, dietary restriction, body shape/weight over-valuation, and body image disturbances (Ambwani et al., 2014;.Lafrance Robinson et al., 2014; Lavender & Anderson, 2010; Whiteside et al., 2007). Moreover, difficulties in emotion regulation have been considered as a transdiagnostic contributing risk factor for development and maintenance of eating disorders (Brockmeyer et al., 2014; Davies, Swan Schmidt, & Tchanturia, 2012; Harrison et al., 2009; Svaldi, Griepenstroh, et al., 2012).

Maladaptive emotion regulation strategies and disordered eating behaviors. In line with emotion regulation theories, which posit that negative affective states and lack of adaptive emotion regulation skills play a very important role in disordered eating behaviors (Anestis et al., 2007; Baumeister, 1990; Heatherton & Baumeister, 1991; Polivy & Herman, 1993; Stice et al., 1998), existing research provides evidence that individuals with symptoms of eating pathology report elevated use of several specific maladaptive emotion regulation strategies. One of such the most studies maladaptive emotion regulation strategies is *rumination* (Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Nolen-Hoeksema et al., 2008). Research on the relationship between rumination and disordered eating behaviors revealed that individuals with various eating disorder symptoms often report elevated levels of rumination (Cowdrey & Park, 2011, 2012; Naumann, Tuschen-Caffier, Voderholzer, Caffier, & Svaldi, 2015; Park et al., 2011, 2012). It is possible that they use rumination as a cognitive avoidance strategy in an attempt to escape from the aversive self-awareness states

(Heatherton & Baumeister, 1991; Nolen-Hoeksema et al., 2008; Nolen-Hoeksema & Watkins, 2011). For example, for college students who tend to ruminate excessively, unpleasant rumination related to body dissatisfaction may push them to use binge eating behavior as an escape from such aversive states (Gordon, Holm-Denoma, Troop-Gordon, & Sand, 2012). In individuals with anorexia nervosa, rumination may help them to avoid starvation-related body cues (Park et al., 2011, 2012).

Another maladaptive emotion regulation strategy closely related to rumination, which has been identified in individuals with disordered eating behaviors, is s*elf-criticism* (Blatt, 1995; Brockmeyer et al., 2014; Dunkley & Grilo, 2007; Kelly & Carter, 2013). For example, research studies revealed that eating disorder symptoms in individuals with pathological binge eating are entirely explained by perfectionism and self-criticism (Dunkley, Blankstein, Masheb, & Grilo, 2006). Moreover, it was suggested that self-criticism is a potent maladaptive emotional regulation process, which contributes to increased drive for thinness through fueling a sense of being inferior or flawed (Pinto-Gouveia, Ferreira, & Duarte, 2012).

Cognitive and behavioral avoidance or distraction strategies are also considered to be maladaptive emotion regulation strategies. There is substantial evidence that individuals who experience difficulties in tolerating distress and accepting negative affect are at risk for developing eating disorders (Anestis et al., 2007; Corstorphine et al., 2007; Waller & Meyer, 1997). Specifically, poor distress tolerance (Linehan, 1993a, b; Linehan, 2015a, b;) may result in behavioral outcomes such as binge eating and restrictive eating (Hambrook et al., 2011; Raykos, Byrne, & Watson, 2009). Individuals who cannot tolerate affective states, often employ maladaptive avoidant emotion regulation skills such as thought suppression (Najmi & Wegner, 2008, 2009; Wegner, 1994, 2011; Wegner & Erber, 1992; Wenzlaff & Wegner, 2000) and unfocused mental distraction (Nolen-Hoeksema, 1991; Sheppes, Scheibe, Suri, & Gross,2011; Wegner, Schneider, Carter, & White, 1987), which have a “rebound effect” causing more intrusions of the thought than occurred without prior suppression (Abramowitz, Tolin, & Street, 2001; Najmi & Wegner, 2009; Rassin, 2005; Wenzlaff &

Wegner, 2000). Chronic efforts to suppress unpleasant or unwanted cognitions may represent avoidance strategies that underlie the relationship between the experience of negative affect, intrusive thought about food, increased food consumption, higher levels of dietary restraint, and eating disorder symptoms (Erskine & Georgiou, 2010; Harnden, McNally, & Jimerson, 1997; Lavender et al., 2009; Lavender, Anderson, & Gratz, 2012; Leehr et al., 2015; O'Connell, Larkin, Mizes, & Fremouw, 2005; Oliver & Huon, 2001; Soetens, Braet, & Moens, 2008). Likewise, in order to coping with stressful events and trying to regulate negative emotions, individuals may use various behaviors as experiential /behavioral avoidance and distraction emotion regulation strategies (Gross, 1998; Lampard, Byrne, McLean, & Fursland, 2011; Rawal, Park, J., & Williams, 2010; Van Dillen & Koole, 2007). Such behavioral strategies (e.g., watching TV) may bring temporal relief but are ineffective long-term because they do not aim at solving the problem causing negative affect or improving the situation directly (Gaudreau & Blondin, 2004; Shimazu & Schaufeli, 2007; Suls & Fletcher, 1985; Uusberg, Thiruchselvam, & Gross, 2014).

Another maladaptive emotion regulation strategy is *expressive suppression* (Butler et al., 2003; Gross & Levenson, 1993; Gross & Thompson, 2007). When individuals with disordered eating behaviors perceive threat from negative emotions, thinking that their emotions are unmanageable, they may use expressive suppression to inhibit expression of their emotions. Individuals with eating disorders develop the tendency to use expressive suppression as a part of Early Maladaptive Schemas (EMS) when they are still children and adolescents (Ioannou & Fox, 2009; Lawson, Emanuelli, Sines, & Waller, 2008; Unoka, Tölgyes, Czobor, & Simon, 2010). Being unable to express their emotions, they learn to handle emotional distress by turning their expression and lack of insight inward (viz., feeling "fat"), resulting in body dissatisfaction and disordered eating (Forbush, K., & Watson, D., 2006; Geller & Cockell, 2000; Zaitsoff, Geller, & Srikameswaran, 2002; Hayaki, Friedman, & Brownell, 2002). Empirical evidence suggests that attempts to suppress expression of emotions may trigger emotional eating in healthy controls (Taut, Renner, & Baban, 2012), binge eating in

individuals with binge eating disorder (Kittel et al., 2015; Svaldi, Caffier, & Tuschen-Caffier, 2010), and desire to overeat in restrained eaters (Svaldi, Tuschen-Caffier, Lackner, Zimmermann, & Naumann, 2012).

Adaptive emotion regulation strategies and disordered eating. For both individuals with disordered eating behaviors and healthy controls, inability to use adaptive emotion regulation strategies to regulate emotions effectively may result in elevated use of accessible yet maladaptive secondary strategies of emotional eating or binge-eating (Danner et al., 2012; Evers et al., 2010; Leehr et al., 2015; Taut et al., 2012; Whiteside et al., 2007). Limited use of adaptive emotion regulations strategies has been also linked to eating pathology (Aldao et al., 2010; Danner et al., 2012; Danner, Sternheim, & Evers, 2014; Svaldi, Griepenstroh, et al., 2012).

For example, recent studies suggest that individuals who lack access to *cognitive reappraisal* (Gross, 1998a; Gross & John, 2003) tend to have higher levels of disordered eating behaviors (Danner et al., 2012; Danner et al., 2014; Kelly et al., 2012; Svaldi, Griepenstroh, et al., 2012; Svaldi, Tuschen-Caffier, et al., 2014). Indeed, cognitive reappraisal is a vital emotion regulation strategy that may be used to protect against disordered eating behaviors (e.g., overeating, binge-eating) and to develop and maintain healthy eating behaviors (Giuliani et al., 2013; Kelly et al., 2012; Svaldi et al., 2010).

Comparatively, *cognitive* and *behavioral problem solving* (D'Zurilla, 1986, 1988; D'Zurilla & Goldfried, 1971; D'Zurilla & Nezu, 1982, 1999) is another adaptive emotion regulation strategy, compromised in individuals with disordered eating behaviors (Aldao & Dixon-Gordon, 2014; Holt & Espelage, 2002; Chang, Downey, & Salata, 2004; VanBoven & Espelage, 2006). For example, deficits in problem solving emotion regulation strategies have been observed in female college student with high levels of drive-for-thinness, body dissatisfaction, and eating disorder symptoms (Janzen, Kelly, & Saklofske, 1992; Ridout, Matharu, Sanders, & Wallis, 2015; VanBoven &

Espelage, 2006), and in women with binge eating disorder, anorexia, and bulimia nervosa (Bloks, Spinhoven, Callewaert, Willemse-Koning, & Turksma, 2001; Espelage, Quittner, Sherman, & Thompson, 2000; Paterson et al., 2011; Svaldi et al., 2011).

Another adaptive emotion regulation strategy is *acceptance* (Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012). Acceptance is associated with decreased negative affect and depressive symptoms (Alberts, Schneider, & Martijn, 2012; Shallcross, Troy, Boland, & Mauss, 2010), more positive emotions, and stronger expressivity (Dan-Glauser & Gross, 2015). This emotion regulation strategy is particularly important in circumstances, in which individuals must accommodate to the stressor which cannot be changed (Carver et al., 1989). Research findings demonstrate that individuals who tend to avoid unpleasant and emotionally negative experiences when faced with stressful situations, do not habitually use acceptance as an emotion regulation strategy (Flaxman, Blackledge, & Bond, 2011; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Wolgast et al., 2013). In general, people suffering from psychological disorders do not use this strategy frequently (Aldao et al., 2010). A handful of studies examining eating patterns in relation to emotion regulation, have found that acceptance of emotions results in lower body dissatisfaction (Atkinson & Wade, 2012; Wade, George, & Atkinson, 2009) and less disordered eating behaviors (Han & Pistole, 2014; Lavender & Anderson, 2010; Wollenberg, Shriver, & Gates, 2015). Interventions which include acceptance strategies have been more effective than distraction strategies in dealing with food chocolate cravings in participants high on chocolate craving (Forman et al., 2007).

Adaptive vs. maladaptive emotion regulation strategies in disordered eating behaviors. In terms of relative use of putatively maladaptive (i.e., avoidance, suppression, rumination) and putatively adaptive emotion regulation strategies (i.e., reappraisal, problem solving, and acceptance) across different groups of psychopathology including eating disorders, recent meta-analysis (Aldao et al., 2010) revealed that maladaptive emotion regulation strategies were associated with more symptoms of psychopathology and adaptive strategies were associated with less symptoms. However,

the magnitude of association between maladaptive strategies and all types of psychopathology including eating disorders (i.e., collapsing across symptom types) was stronger than the magnitude of association between adaptive emotion regulation strategies and psychopathology. Aldao and colleagues (2010) hypothesized that with the exception of problem solving, presence of maladaptive emotion-regulation strategies may be more deleterious for mental health and well-being than the relative absence of adaptive emotion-regulation strategies. Also, this meta-analysis demonstrated that the association between symptoms of eating disorders and certain maladaptive emotion regulation strategies (i.e., avoidance and rumination) and adaptive emotion regulation strategies (i.e., reappraisal) was weaker than the association between these strategies and symptoms of depression and anxiety. According to Aldao and colleagues (2010), the association between deficits in emotion regulation and eating pathology is weaker because individuals with full blown clinical eating disorders may use disordered eating (e.g., binge eating) behaviors as a maladaptive emotion regulation strategy to ameliorate negative emotions and distress. Recent studies examining use of various emotion regulation strategies and eating pathology in clinical and nonclinical populations (e.g., Aldao, Jazaieri, Goldin, & Gross, 2014; Aldao & Nolen-Hoeksema, 2010, 2012), confirmed this asymmetrical pattern, where habitual use of maladaptive emotion regulation strategies was more strongly associated with symptoms of psychopathology than use of adaptive strategies. Overall, research evidence suggests that healthy individuals report significantly less emotion regulation problems than participants from various eating disorder groups, using adaptive emotion regulation strategies (i.e., reappraisal, reframing and growth and acceptance) significantly more often, and maladaptive emotion regulation strategies (i.e., self-criticism and expressive suppression) significantly less often than participants with eating disorders (Aldao et al., 2010; Svaldi, Griepenstroh, et al., 2012).

Emotion regulation strategies and adaptive eating behaviors. Although multiple studies examined the role of emotion regulation and importance of specific emotion regulation strategies in

disordered eating behaviors, only a few studies explored the relationship between emotions and emotion regulation and healthy eating behaviors (i.e., intuitive eating). For example, evidence was found that intuitive eating is inversely related to negative affect (Tylka & Kroon Van Diest, 2013; Dockendorff et al., 2012), poor interceptive awareness (Tylka, 2006; Tylka & Kroon Van Diest, 2013), and depression (Bacon et al., 2005). Souse and Nilsson found that intuitive eating is negatively related to self-silencing, a construct that has been defined as "the suppression of expressing one's thoughts, feelings, and needs" (Shouse & Nilsson, 2011, p. 451) and equated with an emotion regulation strategy in the literature (Aldao et al., 2010). Several groups of researchers who studies intuitive eating in the context of positive emotions and adaptive self-regulation processes, revealed that individuals who eat more intuitively report higher levels of positive affect (Dockendorff et al., 2012; Tylka & Kroon Van Diest, 2013; Tylka & Wilcox, 2006). Evidence exists that intuitive eaters also have higher awareness and acceptance of their emotions (Shouse & Nilsson, 2011), and can better tolerate distress (Schoenefeld & Webb, 2013). Moreover, they have higher interoceptive sensitivity (Herbert et al., 2013; Oh et al., 2012), use proactive coping and social problem solving (Tylka & Wilcox, 2006), and have higher levels of self-compassion (Schoenefeld & Webb, 2013; Shouse & Nilsson, 2011; Stapleton & Nikalje, 2013). Regardless the above mentioned studies which explored emotion regulation constructs in adaptive eating behaviors, several authors stressed that it is important to conduct research related to intra-individual psychological protective processes (e.g., emotion regulation) related to prevention of eating disorders and promotion of healthy eating behaviors (Cook-Cottone, 2006; Cook-Cottone, 2015; Piran, 2010, 2015; Piran & Teall, 2012; Tylka & Kroon Van Diest, 2015). Thus, research examining emotion regulation in intuitive eating is warranted.

Theories explaining the role of emotion regulation in eating behaviors. There are many reasons why habitual use of adaptive and maladaptive emotion regulation strategies may be relevant for healthy eating behaviors of young adult college women. First, a considerable amount of

theoretical literature has been published on the relationship between emotion regulation and eating behaviors. Mindfulness theories suggest that emotion regulation and use of adaptive emotion regulation strategies (i.e., positive reappraisal) are linked to improved body awareness and positive body related cognitions (Garland, Farb, et al., 2015a,b; Holzel et al., 2011; Vago & Silbersweig, 2012). Moreover, according to the theory of emotions (Lange & James, 1967) highlighting the association between emotional experiences and interoceptive awareness (Damasio et al., 1991; Pollatos et al.,, 2007; Craig, 2002; Zaki et al., 2012), individuals who have a well-developed interoceptive awareness and accuracy may experience better emotion regulation (Farb et al., 2015; Füstös et al., 2013). Furthermore, according to the process model of emotion regulation (Gross, 1998a; Gross, 2015b) and the affect regulation models of disordered eating (Anestis et al., 2007) including the escape theory (Heatherton & Baumeister, 1991) and the masking theory (Herman & Polivy, 1988), disinhibited eating functions as emotion-regulation strategy in its own right (e.g., Macht, 2008; Macht et al., 2004; Polivy & Herman, 2002; Cowdrey & Park, 2012). Thus, individuals regulating their emotions by eating may be less likely to use adaptive emotion-regulation strategies, because emotional and disinhibited eating fill the individuals' emotion-regulation needs (Aldao & Dixon-Gordon, 2014; Aldao et al., 2010). It is possible that healthy individuals do not engage in maladaptive eating behaviors (i.e., emotional, disinhibited, and restrictive eating, Evers et al., 2010) because they do not need to attempt to escape or distract themselves from negative emotions. Thus, they respond to these emotions with greater adaptive (e.g., positive reappraisal) and fewer maladaptive (e.g., suppression) emotion regulation strategies.

Recent research supported these theories suggesting that college students tend engage in disordered eating cognitions and restrictive or disordered dieting patterns to compensate for their inability to adaptively regulate emotions (Ambwani et al., 2014; Whiteside et al., 2007) and to distract themselves from consequences of stress (Sulkowski et al., 2011; Wolff et al., 2000). For example, according to several studies, difficulties with emotion regulation account for significant variance in

disordered eating behaviors over and above body mass index (BMI), negative affect, food restriction, and body image disturbances (Ambwani et al., 2014; Whiteside et al., 2007). It was established that for healthy college women emotion regulation difficulties and use of maladaptive emotion regulation strategies (e.g., suppression) resulted in excessive dieting, bulimic, or binge eating behaviors (Evers et al., 2010; Lafrance Robinson et al., 2014), while use of adaptive emotion regulation strategies failed to show this association (Evers et al., 2010). Finally, research evidence suggested that compared to individuals with eating disorders, healthy individuals experienced lower levels of emotion regulation difficulties (Brockmeyer et al., 2014; Harrison et al., 2009) and had greater tendency to use adaptive emotion regulation strategies compared to maladaptive emotion regulation strategies (Svaldi, Griepenstroh, et al., 2012).

Body Appreciation

Body Image

Accruing evidence indicates that in addition to the way young women attend to life situations, interpret them, and react to emotions stirred by them either using mindfulness and adaptive emotion regulation strategies to cope or being mindless and maladaptive in their emotion regulation choices (Aldao et al., 2010; Baer et al., 2006; Lavender et al., 2011; Li et al., 2015), the way they perceive their bodies and react to their body signals plays an influential role in their eating behaviors (Augustus-Horvath & Tylka, 2011; Tylka, 2006; Cash & Deagle, 1997; Farrell, Lee, & Shafran, 2005; Trindade & Ferreira, 2014, 2015). Individuals' attitudes, perceptions, behaviors, and experiences related to their bodies, especially to their physical appearance (Muth & Cash, 1997; Kashubeck-West & Saunders, 2001; Kearney-Cooke & Striegel-Moore, 1997; Pruzinsky & Cash, 2002), represent *body image*, a term that has been first coined by the Austrian neurologist and psychoanalyst Paul Schilder (1935), and has been further theorized as a complex multidimensional

construct with both positive and negative dimensions by body image scholars (Cash, 2004, 2011; 2012; Cash & Grasso, 2005;. Cash & Pruzinsky, 2002; Hrabosky et al., 2009).

Body image is a complex multidimensional construct with both positive and negative dimensions (Cash, 2011; 2012; Cash & Pruzinsky, 2002; Hrabosky et al., 2009; Kelley, Neufeld, & Musher-Eizenman, 2010). Body image has been conceptualized as one's attitudes, emotions, perceptions, behaviors, and experiences related to one's body, especially its physical appearance (Cash, 2004, 2011; Cash & Pruzinsky, 1990, 2002; Muth & Cash, 1997; Pruzinsky & Cash, 2002). Although these features are believed to be fairly consistent over time, they are also somewhat malleable by experiences and contextual variables (Gardner, Friedman, & Jackson, 1999; Melnyk, Cash, & Janda, 2004; Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006; Dohnt & Tiggemann, 2006).

For over a decade, multiple theoretical and empirical studies have been focused on the role of negative body image associated with body image disturbances, body size overestimation, and other negative body-related emotions and cognitions in the development and maintenance of eating disorders (Cash & Grasso, 2005; Stice, 2002a; Stice, Marti, & Durant, 2011; Shroff, Calogero, & Thompson, 2009; Smolak & Cash, 2011; Smolak & Thompson, 2009; Tiggemann, 2002, 2004; Tylka, 2004; Tylka, & Subich, 2004). A large body of data has documented that cognitive, emotional, perceptual, behavioral characteristics of body image (Cash, 2004; Cooper & Fairburn, 2011; Fairburn, 2008; Schmidt & Treasure, 2006; Treasure & Schmidt, 2013) as well as its spatial, perceptual, and interoceptive components (Ahrberg et al., 2011; Guardia, Carey, Cottencin, Thomas, & Luyat, 2013; Favaro et al., 2012; Riva, 2014) are associated with body image disturbances, body size overestimation, and other negative body-related emotions and cognitions contribute to the development and maintenance of eating disorders (e.g., Stice, 2002a; Stice et al., 2011; Tylka, 2004; Tylka, & Subich, 2004). Although negative body image is a worthy construct to measure, it is important to recognize and explore positive body image due to research, treatment, prevention, and

health promotion implications (Tiggemann, 2015; Tylka, 2011, 2012; Tylka & Kroon Van Diest, 2015; Webb, Wood-Barcalow, & Tylka, 2015). Only recently, the study of positive body image and its role in eating behaviors has gained considerable interest (e.g., Avalos et al., 2005, Cook-Cottone, 2015; Halliwell, 2015; Piran, 2015; Tiggemann, 2015; Tylka, 2004; Tylka & Wood-Barcalow, 2015b, c; Wood-Barcalow, Tylka, & Augustus-Horvath, 2010; Webb et al., 2015).

Positive body image is one of the "transtherapeutic" processes (e.g., Desrosiers et al., 2013; Greeson et al., 2014) that may promote the likelihood of healthy intuitive eating behaviors in college women. From the cognitive neuroscience perspective, positive body image may play the role of a tool college women may use to process and integrate verbal, visual., and interoceptive information, generate meaning, organize experience, and shape their behaviors (Ahrberg, Trojca, Nasrawi, & Vocks, 2011; Favaro et al., 2012; Riva, 2014). Positive body image may be described as a holistic state of body-self integration, that plays an important role in how individuals relate to the self and feel "at one" with their bodies (Menzel & Levine, 2011) experiencing embodiment (Halliwell, 2015; Piran, 2015; Piran & Teall, 2012; Tiggemann, 2015; Tylka & Wood-Barcalow, 2015b; Wood-Barcalow et al., 2010). Positive body image is a complex, stable, malleable, and multifaceted construct (Tylka & Wood-Barcalow, 2015c; Webb et al., 2015) different from being just the opposite of negative body image and being more than body satisfaction or appearance evaluation (Tylka & Wood-Barcalow, 2015b, c; Webb et al., 2015) with multiple facets such as body appreciation (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015b; Wood-Barcalow et al., 2010), inner positivity (Tylka, 2011) that radiates outward and manifests as adaptive behavior (Frisén & Holmqvist, 2010; Wood-Barcalow et al., 2010), body image flexibility (Hayes et al., 1999; Sandoz et al., 2013), ability to filter information in a body-protective manner (Holmqvist & Frisén, 2012; Wood-Barcalow et al., 2010), body acceptance and love (Frisén & Holmqvist, 2010; Wood-Barcalow et al., 2010), adaptive appearance investment (Cook-Cottone, 2015; Wood-Barcalow et al., 2010), broad conceptualization of beauty (Tylka & Iannantuono, 2016; Wood-Barcalow et al., 2010), body functionality (Avalos &

Tylka, 2006; Homan & Tylka, 2014), and attunement (body responsiveness, mindful self-care) (Cook-Cottone, 2006; Daubenmier, 2005). The most comprehensive and well researched facet of positive body image is *body appreciation* (Tylka, 2011, 2013; Tylka & Wood-Barcalow, 2015b).

Body Appreciation

Body appreciation, a relatively new conceptualization of positive body image as part of a healthy way of relating to one's self, is more than the opposite of negative body image, as it holds components extending beyond being positive appearance evaluation and body satisfaction (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015b). Body appreciation emerged out of the recent focus on health and wellness as opposed to psychopathology (Avalos et al., 2005; Tylka, 2004; Wood-Barcalow et al., 2010). More than 10 years ago Avalos and colleagues (2005) developed the Body Appreciation Scale (BAS), developed a measure of body appreciation (i.e., the Body Appreciation Scale) that contained several central aspects of positive body image. The scale was further refined by Tylka and Wood-Barcalow (2015b). Body appreciation has been described as accepting, holding favorable opinions toward, attending to one's bodily needs, feeling comfortable in the body, and respecting the body, while also rejecting media-promoted appearance ideals as the only form of human beauty (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015b).

Body appreciation as a holistic model of positive body image. Holistic model of positive body image created by Wood-Barcalow and colleagues (2010) was specifically coined to describe and explain the development and maintenance of positive body image. Holistic model of positive body image built upon the previous conceptualization of positive body image (Avalos et al., 2005), uncovering additional characteristics of women's positive body image such as positive outlook on their bodies often reflecting women's outer radiance, or a "glow"' (Wood-Barcalow et al., 2010, p.110), focus on their body's assets rather than dwell on their imperfections, mindful connection with their body's needs, and ability to rejecting negative incoming information, reframe it in a body-

protective manner, and internalize positive incoming body-related information. The holistic model of positive body image reflects three interdependent processes (reciprocity, filtering, and fluidity) and four structures (sources (of information, or sources of communication, etc.), filter, body investment, and body evaluation) to the body image literature (Wood-Barcalow et al., 2010). According to this model, the concept of fluidity of body image may be illustrated by women's enhanced ability to accept sources of positive body-related information and to reject sources of negative information, allowing them to decrease their body investment and to stay positive in their body evaluations. When women reciprocally and proactively influence these sources (e.g., mentoring people to love their bodies, surrounding themselves with people who promote body acceptance and self-care), positive sources information get more active. Moreover, according to this model, the protective filter consisting of positive emotions, rational beliefs, and realistic perceptions, allows women to selectively filter positive and negative information, helping them to promote and maintain positive body image. The protective filter also helps shape body investment behaviors to be functional but modest. Furthermore, positive body evaluations result in more caring non-obsessive investments into body image, enabling women to nurture their bodies and to appreciate their bodies unique qualities. Moreover, according to this model, individuals who appreciate their bodies influence the sources of information by radiating their inner positivity to their outer behavior (e.g., choosing to interact with positive people) and teaching body appreciation to others in their community, culture, and social network. Overall, the holistic model of positive body image may be viewed from the mindfulness perspective, where the processes of filtering, reciprocity, fluidity, represent such mindfulness mechanisms as attention regulation, metacognitive awareness, body awareness, acceptance, modification of attentional biases, positive reappraisal, positively valenced emotional states and positive cognitions, savoring, insight, meaning generation, transcendence, and motivation for values-driven behaviors (e.g., Brown et al., 2007; Garland, Farb, et al., 2015a,b; Garland, Geschwind, et al., 2015; Holzel et al., 2011; Shapiro et al., 2006; Vago & Silbersweig, 2012).

Correlates of body appreciation. Conceptually and empirically body appreciation is more than the opposite of negative body image, as it holds components extending beyond being positive appearance evaluation and body satisfaction (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015b). The Body Appreciation Scale (BAS) has been utilized by researchers to better understand unique features, correlates, and potential outcomes of positive body image. Research findings suggest that women high on body appreciation are more protected against "threats or challenges to body-image experiences" (Cash, Santos, & Williams, 2005, p. 191) associated with sociocultural messages regarding unattainable standards of appearance, family criticism, lack of acceptance, and high peer competition that provokes body related negative emotions and body comparisons (Andrew et al., 2015b; Craig, Martz, & Bazzini, 2007; Ferguson, Muñoz, Garza, & Galindo, 2014; Halliwell, 2013; Stice, Maxfield, et al., 2003), demonstrating lower levels of body dissatisfaction in response to media pressure to be thin (Halliwell, 2013). Even if they shift toward a more negative body image after exposure to media thin ideals, they manage to readjust their filter to reframe this information (Andrew et al., 2015b), dealing with it in a body protective manner (Tylka, 2011) and keeping their overall positive body image quite stable (e.g., trait body image; Melnyk et al., 2004). By filtering the societal messages about ideal appearance and keeping favorable evaluations of their bodies (Swami, Hadji-Michael, et al., 2008), women with high body appreciation are able to resist self-objectification (Andrew et al., 2015a; Calogero, Tantleff-Dunn, & Thompson, 2010; Fredrickson & Roberts, 1997; Tylka, 2011; Tylka & Wood-Barcalow, 2015b; Wood-Barcalow et al., 2010), and are overall more self-compassionate (Albertson, Neff, & Dill-Shackleford, 2014; Homan & Tylka, 2015; Kelly, Miller, & Stephen, 2016; Kelly & Stephen, 2016; Toole & Craighead, 2016; Wasylkiw, MacKinnon, & MacLellan, 2012). Importantly, higher body appreciation has been associated with better interceptive awareness (Tylka, 2006; Tylka, Calogero, et al., 2015) allowing individuals to be more attuned to their bodily needs

Research findings have revealed that body appreciation, as an index of psychological health, is inversely related to maladaptive characteristics such as psychological distress, negative affect, maladaptive perfectionism, and neuroticism (Avalos et al., 2005; Iannantuono & Tylka, 2012; Swami, Hadji-Michael, & Furnham, 2008; Swami, Stieger, et al., 2012; Swami, Tran, et al., 2015; Tylka & Kroon Van Diest, 2013). Numerous studies have demonstrated that women with higher body appreciation experience lower levels of disordered eating cognitions and emotions (e.g., body dissatisfaction, body shame, body image avoidance, self-comparison, social physique anxiety, contingent self-worth dependent on appearance, maladaptive perfectionism, internalization of societal appearance ideals) as well as health-compromising disordered eating behaviors (e.g., eating disorder symptomatology, body surveillance, body checking, and weight-loss behaviors) (e.g., Albertson, Neff, & Dill-Shackleford, 2014; Andrew, Tiggemann, & Clark, 2016c; Avalos et al., 2005; Iannantuono & Tylka, 2012; Kelly, Miller, & Stephen, 2016; Lobera & Ríos, 2011; Tylka, 2006; Swami, Kannan, et al., 2012; Swami, Mada, & Tovée, 2012; Swami, Stieger, et al., 2008; Swami, Stieger, et al., 2012; Swami & Tovée, 2009; Tylka, 2013; Tylka & Kroon Van Diest, 2013; Tylka & Wood-Barcalow, 2014, 2015b; Wasylkiw & Butler, 2013).

Moreover, there is a number of published studies that indicate that body appreciation is related to a range of positive outcomes including favorable appearance evaluation and body esteem (Avalos et al., 2005; Swami, Hadji-Michael, et al., 2008), optimism (Avalos et al., 2005; Dalley & Vidal, 2013), self-esteem (Avalos et al., 2005; Swami, Airs, Chouhan, Leon, & Towell, 2009; Swami, Campana, & Coles, 2012; Swami, von Nordheim, & Barron, 2015; Tylka, & Wood-Barcalow, 2015b; Wasylkiw et al., 2012), extraversion (Swami, Hadji-Michael, et al., 2008), proactive coping (Avalos et al., 2005; Tylka, & Wood-Barcalow, 2015b), and other measures of psychological well-being, such as positive affect, adaptive perfectionism, trait emotional intelligence, subjective happiness, and overall life satisfaction (Avalos et al., 2005; Iannantuono & Tylka, 2012; Swami, Begum, & Petrides, 2010; Swami, Hadji-Michael, et al., 2008; Swami, Stieger, et al., 2008; Swami, Tran, et al., 2015).

Demographically, body appreciation may be more important for college women than for college men because empirical findings indicate that young women tend to have lower body appreciation compared to men (Swami, Hadji-Michael, et al., 2008; Swami, Stieger, et al., 2008; Tylka, 2013; Tylka & Kroon Van Diest, 2013) and to older women (Augustus-Horvath & Tylka, 2011; Tiggemann & McCourt, 2013). Behaviorally, individuals high on body appreciation tend to practice more health-promoting behaviors (Andrew et al., 2016b), experience better sexual functioning and engage in protective sexual health behaviors (Satinsky, Reece, Dennis, Sanders, & Bardzell, 2012; Winter & Satinsky, 2014), engage and physical activity especially when the motive to exercise is not appearance based (Homan & Tylka, 2014), and practice intuitive eating (i.e., eating according to physiological hunger and satiety cues; Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Oh et al., 2012; Tylka & Kroon Van Diest, 2013).

Although body appreciation is a statistically strong contributing intrapersonal factor explaining intuitive eating (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Oh et al., 2012; Tylka & Kroon Van Diest, 2013), there may be other important psychological processes which may significantly contribute to intuitive eating (Cook-Cottone, 2015; Piran, 2015; Tylka, Russell, et al., 2015). Given that conceptually intuitive eating is located at the healthy end of the eating behaviors continuum (e.g., Mintz & Betz, 1988; Tylka & Subich, 1999, 2004) that is bounded on its ends by two attitudes representing opposite extremes, theories explaining processes underlying disordered eating behaviors such as emotional eating (Baumeister, 1991; Evers et al., 2010; Spoor et al., 2007), external eating (Van Strien et al., 2009), and restrained eating and dieting (Brogan & Hevey, 2013; Herman & Polivy, 1980; Lowe & Timko, 2004; Van Strien et al., 1986; Vartanian et al., 2006), may be used to provide new insights on how adaptive counterparts of predictors of disordered eating behaviors may account for variability in intuitive eating. Thus, along with the contribution of body appreciation to intuitive eating, research examining relative contribution

of dispositional mindfulness and habitual use of adaptive and maladaptive emotion regulation strategies to intuitive eating is deemed warranted.

From the information processing theoretical standpoint, research studies have demonstrated that women who develop body image disturbances have a tendency to experience appearance related biased schematic information processing (e.g., self-conscious negative emotions and cognitions such as body shame) (Li, Jackson, & Chen, 2011; Rosser, Moss, & Rumsey, 2010; Smeets, Jansen, & Roefs, 2011; Smith & Rieger, 2006), that has been linked to disordered eating behaviors (Lee & Shafran, 2004; Vitousek & Hollon, 1990;.Williamson & Muller, 1999; Williamson, Perrin, Blouin, & Barbin, 2000). It is possible that higher level of body appreciation in women involves a positively biased perception of their own attractiveness, which promotes filtering of negative body-related information (Cook-Cottone, 2015; Tiggemann, 2015; Wood-Barcalow et al., 2010), protects from negatively biased processing of information (Garland & Howard, 2014; Jansen, Smeets, Martijn, & Nederkoorn, 2006; Martijn, Alleva, & Jansen, 2015), and helps them to have a healthy embodied awareness of their internal and external experiences, and to engage in mindful self-care (Cook-Cottone, 2015; Wood-Barcalow et al., 2010).

Indeed, as it has been mentioned earlier, empirical evidence suggests that body appreciation is the most consistent and robust predictor of intuitive eating (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Iannantuono & Tylka, 2012; Kroon Van Diest & Tylka, 2010).

Theoretical Framework

Recent advances in psychological science, neuroscience, and mindfulness research suggest that complex cognitive, emotional, and behavior regulation processes underlie eating behaviors (Heron, Scott, Sliwinski, & Smyth, 2014; Masuda et al., 2012). The framework used to explain these processes has been derived from previously discussed mindfulness theories (Garland, Farb, et al., 2015a,b; Greeson et al., 2014; Hart et al., 2013; Hölzel et al., 2011; Malinowski, 2008; Shapiro et al.,

2006; Vago & Silbersweig, 2012), theory of emotion (Lange & James, 1967), emotion regulation theories (Gross, 1998a, b; Gross & Thompson, 2007), the affect regulation models of disordered eating (Anestis et al., 2007; Heatherton & Baumeister, 1991; Herman & Polivy, 1988; Macht et al., 2004; Polivy & Herman, 2002; Stice, Shaw, & Nemeroff, 1998), and the intuitive eating theory (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006). Furthermore, information processing theory (Dobson & Dozois, 2004; Faunce, 2002; Izard, 2007; Lee & Shafran, 2004; Williamson & Muller, 1999; Vitousek & Hollon, 1990) may be used to explain processes underlying intuitive eating behaviors. Finally, a systems view is essential to conceptualize how multiple psychological processes may be continuously and mutually influential in the context of intuitive eating behaviors (Barrett, 2009; Barrett & Bar, 2009; Gottlieb et al., 2006; Hölzel et al., 2011; Izard, 2007; Thompson, 2011).

In line with these theories, dispositional mindfulness, is a *first* intrapsychic universal self-regulatory "transtherapeutic" process determined as vital to mental health, wellness and the ability to make healthy lifestyle choices (Brown & Ryan, 2003; Desrosiers et al., 2013; Garland, 2011; Garland & Howard, 2014; Greeson, 2009, 2015; Greeson et al., 2014) probably because it facilitates a perceptual shift resulting in a different relationship with cognitions, emotions and sensations (Bishop et al., 2004; Carmody, 2009). It is possible that mindfulness processes does not only protect individuals from disordered eating cognitions, emotions, and behaviors, but also promote intuitive eating behaviors by reducing experience of negative biases related to body image and self-worth (Vago, 2014; Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007; Verplanken & Tangelder, 2011) and stimulating experience of positive biases associated with more adaptive affective states, self-favoring cognitions, and self-caring behaviors (Clore & Palmer, 2009; Garland & Howard, 2014; Friedman & Förster, 2010; Mathews, 2012). Mindfulness may also support intuitive eating behavior through the association with self-kindness and self-compassion (Neff, 2003b; Neff & Vonk, 2009), qualities important for adaptive and self-caring behaviors such as intuitive eating (Cook-Cottone, 2015; Schoenefeld & Webb, 2013; Tylka, Russell, & Neal, 2015). Moreover, mindful processing

style may promote individuals'mindful ability to attend to their immediate bodies' needs (Jha, Krompinger, & Baime, 2007; Sairanen et al., 2015; Van De Veer, Van Herpen, & Van Trijp, 2016) by shifting their awareness from negative past or future oriented self-narrative perspective to a self-experiential present-centered perspective (Guendelman et al., 2017). Mindful processing may decrease negative self-reflective processing and evaluation (Vago & Zeidan, 2016) by reducing transdiagnostic (Greeson et al., 2014) identification with aversive emotions, thoughts, and body sensations (Bohlmeijer, ten Klooster, Fledderus, Veehof, & Baer, 2011; Hofmann, Sawyer, & Fang, 2010; Wells, 2005). Further, practicing mindful non-judgmental meta-level awareness may help individuals reach better self-understanding (Jopling, 2000) and indirectly increase their attunement with their hunger cues and self-needs (Vago & Silbersweig, 2012), by reducing their stereotypical thinking (e.g., I need to diet because guys are attracted only to skinny girls) (Jankowski & Holas, 2014) and protecting them from behavioral automaticity and impulsivity usually associated with maladaptive eating behaviors (Brown & Ryan, 2003; Kristeller & Wolever, 2011). As to the way mindful individuals respond to external stimuli such as interpersonal interactions with people eating junk food and TV commercials of unhealthy snacks, mindful meta-awareness and attentional processes may facilitate inhibition and task-switching - the crucial executive functions necessary for dampening cognitions triggered by these stimuli (Miyake et al., 2000) and preventing maladaptive eating behaviors (Grinnell, Greene, Melanson, Blissmer, & Lofgren, 2011).

Emotion regulation strategies comprise the *second* set of "transdiagnostic" processes important for healthy eating behaviors (Aldao, 2012, 2013; Aldao & Nolen-Hoeksema, 2010; Aldao et al., 2010). According to emotion regulation theories, increased use of adaptive emotion regulation strategies and decreased use of maladaptive emotion regulation strategies may protect individuals against using eating to regulate negative affect (Meyer, Waller, & Waters, 1998; Polivy & Herman, 1993; Wild et al., 2007) or to escape from aversive self-awareness through narrowing cognitive

attention (Baumeister, 1990; Blackburn, Johnston, Blampied, Popp, & Kallen, 2006; Heatherton & Baumeister, 1991).

Finally, body appreciation, that may be described as a holistic perceptual body representation (Riva, 2014) with cognitive, emotional, interceptive, and behavioral facets (Wood-Barcalow et al., 2010; Iannantuono & Tylka, 2012) is the *third* process underling intuitive eating. Body appreciation may be also explained by mindfulness, information processing, cognitive behavioral, emotion regulation, and intuitive eating theories. These theories would suggest that body appreciation is a positive flexible, adaptive, non-judgmental, and accepting process (Cardaciotto et al., 2008; Castonguay & Beutler, 2005; Holas & Jankowski, 2013; Kabat-Zinn, 1990, 2003, 2005), important for having a healthy, embodied awareness of the internal and external aspects of the self, and for nurturing a positive caring relationship with one's body (Cook-Cottone, 2015; Greeson et al., 2014). From the perspective of the above mentioned theories, individuals with high body appreciation must experience low levels of cognitive biases and maladaptive emotion regulation (Cash & Fleming, 2002; Garland & Howard, 2014; Fink et al., 2009; Stewart, 2004; Trindade & Ferreira, 2015; Vitousek & Hollon, 1990). Taken together, these theoretical models may be used to explain intuitive eating and its underlying processes.

Summary

Many gains have been made in understanding adaptive eating behaviors such as intuitive eating, as well as intrapersonal psychological factors that may impact its usage. The aforementioned accomplishments have allowed the current focus of research to shift to areas of individual differences in mindfulness, emotion regulation strategies, and body appreciation. Areas for growth that can be used to improve treatment and prevention of disordered eating behaviors and promotion of adaptive eating behaviors include research factors such as implications of dispositional mindfulness facets and clarification of associations between emotion regulation strategies and eating behaviors. As

knowledge about these factors is obtained, the need of those wishing to become intuitive eaters will be better satisfied. Needs of those affected by disordered eating will be also met.

APPENDIX B

DEMOGRAPHIC SURVEY

Please take a few moments to answer the questions below. For each item, please enter or pick the information from the list that best describes you. Keep in mind that all your answers will be kept anonymous and will be used only for research purposes.

1. What is your age (in years)? Please check one selection from the choices below.

1. Which of the following BEST describes your ethnic identification?
   - African American or Black
   - European American, White, or Caucasian
   - Hispanic or Latina or Latino
   - American Indian or Alaska Native
   - Arab or Middle Eastern
   - Asian or Asian American
   - Native Hawaiian or Pacific Islander
   - Biracial or Multiracial
   - Not listed (Please, check this box and respond in the blank below)

3. How do you describe your religion, spiritual practice, or existential worldview?
   - Atheist or having no religious/spiritual beliefs
   - Agnostic or being uncertain but not denying the existence of God
   - Protestant Christian
   - Catholic Christian
   - Orthodox Christian
   - Jehovah's Witness
   - Buddhist
   - Hindu
   - Jewish
   - Muslim
   - Sikh
   - Spiritual but not religious
   - Not listed (Please, check this box and respond in the blank below).

4. What is your academic/student status? Are you currently...?
- Student at a community or technical 2year college
- Undergraduate student at a 4year college or University
- Master's level graduate student
- Doctoral level graduate student
- Not a student

5. What is your current employment status?
- Fulltime
- Employed
- Part-time
- Employed
- Unemployed

6. Which of the following BEST describes your relationship status?
- Single and unattached
- Single with a significant other
- Married
- Separated
- Divorced
- Widowed

7. What is your CURRENT HEIGHT in feet and inches? Please provide actual height in feet and inches OR most accurate estimate.

8. What is your CURRENT WEIGHT in pounds? Please provide actual weight OR most accurate estimate.

APPENDIX C

MINDFULNESS QUESTIONNAIRE

Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) (39 items)

Observing Facet (8 items)

1. When I'm walking, I deliberately notice the sensations of my body moving.
2. When I take a shower or bath, I stay alert to the sensations of water on my body.
3. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
4. I pay attention to sensations, such as the wind in my hair or sun on my face.
5. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
6. I notice the smells and aromas of things.
7. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
8. I pay attention to how my emotions affect my thoughts and behavior.

Describing Facet (8 items)

1. I'm good at finding words to describe my feelings.
2. I can easily put my beliefs, opinions, and expectations into words.
3. It is hard for me to find the words to describe what I'm thinking.
4. I have trouble thinking of the right words to express how I feel about things.
5. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
6. Even when I'm feeling terribly upset, I can find a way to put it into words.
7. My natural tendency is to put my experiences into words.
8. I can usually describe how I feel at the moment in considerable detail.

Acting with Awareness Facet (8 items)

1. When I do things, my mind wanders off and I'm easily distracted.
2. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
3. I am easily distracted.
4. I find it difficult to stay focused on what's happening in the present.
5. It seems I am "running on automatic" without much awareness of what I'm doing.
6. I rush through activities without being really attentive to them.
7. I do jobs or tasks automatically without being aware of what I'm doing.
8. I find myself doing things without paying attention.

Non-judging Facet (8 items)

1. I criticize myself for having irrational or inappropriate emotions.
2. I tell myself I shouldn't be feeling the way I'm feeling.
3. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

4. I make judgments about whether my thoughts are good or bad.
5. I tell myself that I shouldn't be thinking the way I'm thinking.
6. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
7. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
8. I disapprove of myself when I have irrational ideas.

Non-reactivity Facet (7 items)
1. I perceive my feelings and emotions without having to react to them.
2. I watch my feelings without getting lost in them.
3. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
4. In difficult situations, I can pause without immediately reacting.
5. When I have distressing thoughts or images, I feel calm soon after.
6. When I have distressing thoughts or images I am able just to notice them without reacting.
7. When I have distressing thoughts or images, I just notice them and let them go.

Mindfulness (FFMQ) items were rated along a 5-point scale (i.e., 1 = never or very rarely true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = very often or always true). Total Mindfulness (FFMQ) summed score was computed by adding 39 item scores (some of them reversed). Total score ranges from 39 to 195. Higher total scores indicate greater levels of dispositional mindfulness. Separate summed scores for the five mindfulness facets were computed. The Observing facet consists of the sum of eight questions (items 1, 6, 11, 15, 20, 26, 31, 36). Summed scores range from 8 to 40. The Describing facet consists of the sum of eight items: 2, 7, 12, 16, 22, 27, 32 and 37. Items 3, 4, 5 were reversed. Summed scores for this facet range from 8 to 40. The Acting with Awareness facet consists of the sum of eight questions (items 5, 8, 13, 18, 23, 28, 34, 38). All scores for this subscale were reversed. Summed scores range from 8 to 40. The Non-judging facet consists of the sum of eight questions: 3, 10, 14, 17, 25, 30, 35 and 39. All scores for this subscale were reversed. Summed scores for this facet range from 8 to 40. The Non-reactivity facet consists of the sum of seven questions (items 4, 9, 19, 21, 24, 29, 33). Summed scores for this facet range from 7 to 35. Higher scores reflected greater levels of specific mindfulness qualities (facet scores).

APPENDIX D

EMOTION REGULATION STRATEGIES MEASURE

Items from the following instruments will be used to measure emotion regulation strategies: the COPE (Carver et al., 1989), the CERQ (Garnefski et al., 2001), the ICARUS (Kamholz et al., 2006), the ASQ (Hofmann & Kashdan, 2010), and the ERQ (Gross & John, 2003). Additionally, items measuring behavioral avoidance/distraction emotion regulation strategies have been developed specifically for this study (Aldao & Dixon-Gordon, 2014).

Adaptive Emotion Regulation Strategies Scale (16 items)

Cognitive Problem Solving (COPE; Carver et al., 1989)

1. I try to come up with a strategy about what to do.
2. I make a plan of action.
3. I think hard about what steps to take.
4. I think about how I might best handle the problem.

Positive Reappraisal (COPE; Carver et al., 1989)

1. I look for something good in what is happening.
2. I try to see it in a different light, to make it seem more positive.
3. I learn something from the experience.
4. I try to grow as a person as a result of the experience.

Acceptance of Emotions (ASQ; Hofmann & Kashdan, 2010; ICARUS; Kamholz et al., 2006)

1. I think that there is nothing wrong with feeling very emotional after what happened.
2. I think that it is natural to feel this way about what happened.
3. I think that there is nothing wrong with the way I feel about the situation.
4. I think that it is OK if people see me being upset.

Behavioral Problem Solving (COPE; Carver et al., 1989)

1. I concentrate my efforts and do something about it.
2. I take additional action to try to get rid of the problem.
3. I take direct action to get around the problem.
4. I do what has to be done, one step at a time.

Maladaptive Emotion Regulation Strategies Scale (20 items)

Thought Suppression/Mental Distraction (ICARUS; Kamholz et al., 2006)

1. I try to forget what is upsetting me.
2. I distract myself by thinking about other things.
3. I concentrate on something other than how I feel.
4. I try not to think about how I feel.

Expressive Suppression (ERQ, Gross & John, 2003; ASQ; Hofmann & Kashdan, 2010)

1. I keep my emotions about this situation to myself.
2. I suppress my emotional reaction to this situation
3. I hide the way I feel about the situation.
4. I control my emotions about the situation by not expressing them.

Self-Criticism/Rumination (CERQ; Garnefski et al., 2001)

1. I feel that I am the one to blame for it.
2. I feel that I am the one who is responsible for what has happened.
3. I think about the mistakes I have made in this matter.
4. I think that, basically, the cause must lie within myself.
5. I am preoccupied with what I think and feel about what I have experienced.
6. I dwell upon the feelings the situation has evoked in me.

Behavioral Avoidance/Distraction (Parkinson & Totterdell, 1999; Aldao & Dixon-Gordon, 2014)

1. I surf the Internet or engage in social networking such as Facebook to feel better.
2. I sleep to make myself feel better.
3. I watch TV shows or go to movies to think about it less.
4. I run errands or do chores to take my mind off my own problems.
5. I avoid this situation altogether.
6. I avoid doing something about this situation.

Items were rated along a 5-point scale (i.e., 1 = almost never, 2 = sometimes, 3 = regularly, 4 = often, 5 = almost always). Scoring was based on scoring of the COPE (Carver et al., 1989) and the CERQ (Garnefski & Kraaij, 2007). For each strategy scale, item scores were summed, with no reversals of coding. Scoring of Individual subscale scores were obtained by summing the scores belonging to the particular subscale. Two total summed score measuring habitual use of adaptive and maladaptive emotion regulation strategies was computed by adding item scores for each category of strategies: *Adaptive emotion regulation strategies* total summed score (range 16 – 80; 16 items) and *maladaptive emotion regulation strategies* total summed score (range 20 – 100; 20 items). Higher scores reflected greater use of adaptive or maladaptive emotion regulation strategies.

APPENDIX E

POSITIVE BODY IMAGE MEASURE

Body Appreciation Scale (BAS; Avalos et al., 2005) (13 items)

1. I respect my body.
2. I feel good about my body.
3. On the whole, I am satisfied with my body.
4. Despite its flaws, I accept my body for what it is.
5. I feel that my body has at least some good qualities.
6. I take a positive attitude towards my body.
7. I am attentive to my body's needs.
8. My self-worth is independent of my body shape or weight.
9. I do not focus a lot of energy being concerned with my body shape or weight.
10. My feelings toward my body are positive, for the most part.
11. I engage in healthy behaviors to take care of my body.
12. FOR WOMEN: I do not allow unrealistically thin images of women presented in the media to affect my attitudes toward my body.
13. Despite its imperfections, I still like my body.

Body Appreciation (BAS) items were rated along a 5-point scale (i.e., 1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = always). Scores for all items were summed and divided by 13 to create an average score (BAS overall mean). Higher scores reflected greater perceived body appreciation.

APPENDIX F

ADAPTIVE EATING MEASURE

Intuitive Eating Scale–2 (IES-2; Tylka & Kroon Van Diest, 2013) (23 items)

1. I try to avoid certain foods high in fat, carbohydrates, or calories.
2. I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry.
3. If I am craving a certain food, I allow myself to have it.
4. I get mad at myself for eating something unhealthy.
5. I find myself eating when I am lonely, even when I'm not physically hungry.
6. I trust my body to tell me when to eat.
7. I trust my body to tell me what to eat.
8. I trust my body to tell me how much to eat.
9. I have forbidden foods that I don't allow myself to eat.
10. I use food to help me soothe my negative emotions.
11. I find myself eating when I am stressed out, even when I'm not physically hungry.
12. I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort.
13. When I am bored, I do NOT eat just for something to do.
14. When I am lonely, I do NOT turn to food for comfort.
15. I find other ways to cope with stress and anxiety than by eating.
16. I allow myself to eat what food I desire at the moment.
17. I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat.
18. Most of the time, I desire to eat nutritious foods.
19. I mostly eat foods that make my body perform efficiently (well).
20. I mostly eat foods that give my body energy and stamina.
21. I rely on my hunger signals to tell me when to eat.
22. I rely on my fullness (satiety) signals to tell me when to stop eating.
23. I trust my body to tell me when to stop eating.

Intuitive Eating Scale–2 (IES-2) items were rated along a 5-point scale (i.e., 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Scores for items 1, 2, 4, 5, 9, 10, 11 were reversed. Scores for all items were summed and divided by 23 to create an average score (IES-2 overall mean). Higher scores reflected greater intuitive eating tendency.

APPENDIX H

IRB APPROVAL
Oklahoma State University Institutional Review Board

Date:	Friday, April 25, 2014
IRB Application No	ED 1468
Proposal Title:	The Relationship of Strategies of Emotion Regulation, Dispositional Mindfulness, and Body Appreciation to Intuitive Eating for Young Adults
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 04/24/2017

Principal Investigator(s):

Maria Howell	Diane Montgomery
2509 Canterbury Avenue	424 Willard
Stillwater, OK 74075	Stillwater, OK 74078

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

X The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI, advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/ exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Cordell North (phone: 405-744-5700, dawnett.watkinsokstate.edu).

Sincerely,

Shelia Kennison, Chair
Institutional Review Board.

VITA

Maria Howell

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE RELATIONSHIP OF DISPOSITIONAL MINDFULNESS, EMOTION REGULATION, AND BODY APPRECIATION TO INTUITIVE EATING IN FEMALE EMERGING ADULTS

Major Field: Counseling Psychology
Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Educational Psychology (option: Counseling Psychology) at Oklahoma State University (OSU), Stillwater, OK in July 2017.

Completed the requirements for the Master of Science in Educational Psychology at Oklahoma State University (OSU), Stillwater, OK in December 2010.

Completed the requirements for the Master of Arts in Psychology at the Russian New University, Moscow, Russia in June 2010.

Experience:

Doctoral Practicum Counselor, Counseling Psychology Clinic, Oklahoma State University, Stillwater, OK, 2009-2010.

Doctoral Practicum Counselor, Student Counseling Center, OSU, Stillwater, OK, 2010-2011.

Psychology Practicum Student, Eating Disorders Program for Adolescent Girls, Laureate Psychiatric Clinic and Hospital, Tulsa, OK, 2012-2013.

Counseling Psychology Practicum Student, Behavioral Health, White Eagle Indian Health Center, Ponca City, OK, 2011-2014.

Counseling Psychology Predoctoral Intern, Clemson University Student Counseling Center, Clemson, SC, 2016-2017.

Professional Memberships:

American Psychological Association (APA)
Association for Contextual Behavioral Science (ACBS)