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Examination of Intuitive Eating at the Momentary Level

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BY

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DISSERTATION

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ABSTRACT

Background: Intuitive eating involves following internal cues of hunger and satiety to guide eating choices, as opposed to responding to external signals, strong emotions, or dietary rules. This style of eating consistently has been shown to be related to better physical and psychological health indicators. This construct would be better understood if studied at the individual momentary level instead of globally or cross-sectionally. Therefore, the proposed study sought to employ ecological momentary assessment (EMA) to examine the validity of intuitive eating at the momentary level. Additionally, the acceptance and expanded acceptance models of intuitive eating and the roles of weight stigma and internalized weight bias were explored. **Method:** A total of 104 college males and females completed a baseline assessment of intuitive eating and related constructs, a seven-day EMA protocol, and a post-study assessment. During the week of EMA, participants completed recordings on their smart phones of body related attitudes, intuitive eating, and affect while in their natural daily environments. Participants were sent five assessments daily and also were asked to complete recordings before and after eating. **Results:** Analyses found that trait level intuitive eating reported at baseline was significantly correlated with state level intuitive eating reported across EMA recordings, with some evidence suggesting that correlations were stronger before eating compared to after eating. Intuitive eating generally was related to more taste enjoyment, less guilt, less eating restrictions and regret, and less negative affect before eating. Partial support was found for the acceptance

and expanded acceptance models of intuitive eating. Body acceptance by others, body appreciation, and lower appearance/weight exercise motives predicted higher levels of intuitive eating. Finally, internalized weight bias significantly predicted lower intuitive eating scores reported across EMA recordings. **Discussion:** The current study found support for the ecological validity of intuitive eating. Intuitive eaters reported following their internal cues for hunger and satiety to guide their eating and had less guilt, regret, and negative affect surrounding eating. Body respect by the self and others was associated with more intuitive eating, while exercising for appearance reasons and holding negative stereotypes about weight predicted less intuitive eating. This appears to be the first study to examine intuitive eating at the momentary level using EMA. Future work should continue to validate EMA appropriate measures to understand how intuitive eating functions and to improve intervention efforts.

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Chapter 1 Introduction

Research in the field of eating behaviors primarily has been devoted to better understanding disordered eating and its consequences. Intuitive eating represents a deviation from this approach in that the focus is on non-disordered eating patterns. Intuitive eating involves the use of internal satiety and hunger cues to direct eating choices rather than external rules and signals (Tribole & Resch, 2012; Tylka, 2006). The focus on this style of eating originates from an anti-dieting movement. Proponents of this approach argue that traditional dieting and weight-loss treatments have been unsuccessful and even harmful (Bombak, 2014; Calogero et al., 2019; Tylka et al., 2014). For example, traditional weight-loss groups have high attrition rates, and those individuals who complete treatment have frequently regained any lost weight by the time of their follow-up appointments. Importantly, this weight cycling has been linked to poorer physical and psychological outcomes (Bombak, 2014; Moroshki, Brennan & O'Brien, 2011; Tylka et al., 2014). Therefore, instead of simply representing a new dieting or weight loss strategy, intuitive eating is a comprehensive shift away from dieting in terms of how food and eating are approached.

This shift away from dieting has prompted active debates in the field, with proponents of intuitive eating and body positivity arguing for the value to these approaches, while other researchers continue to focus on weight and new approaches to weight loss (Alleva & Tylka, 2018). For example, in response to the negative outcomes and problems that have been associated with rigid dietary control practices (e.g., skipping meals, avoiding whole categories of food), some researchers have promoted flexible control as addressing these concerns (i.e., restricting intake to be less than wanted at meals, eating less after breaking diet rules). However, these flexible strategies are still centered around dieting, and when compared directly to intuitive eating, intuitive eating consistently has been found to be more strongly related to positive

psychological and physical well-being outcomes (Linardon et al., 2019; Tylka, Calogero, Danielsdottir, 2015). Additionally, these "flexible" strategies appear to be highly correlated with rigid control strategies, suggesting that "dieting" called by another name is still simply "dieting." Therefore, most study results suggest that the reliance on external cues and rules for eating often leads to poorer outcomes compared to the practice of eating intuitively.

Intuitive eating was first proposed by Tribole and Resch in their 1995 book as a way to stop chronic dieting and regain pleasure from eating, and since then a body of research has been published that supports the validity of this unique construct. Intuitive eating contains aspects of mindful eating (i.e., being aware of physical hunger/satiety cues and noticing tastes and smells of foods), but it also incorporates a wider philosophy that involves taking an active anti-dieting stance, honoring one's body and hunger cues, and finding both satisfaction and pleasure from food (Tribole & Resch, 2012). Although intuitive eating is related to other adaptive/attuned eating constructs (Kerin, Webb, & Zimmer-Gembeck, 2019), it has been shown to be a construct that does *not* merely represent the absence of disordered eating (Tylka & Wilcox, 2006). Importantly, recent studies of intuitive eating interventions in particular are promising, as they suggest that intuitive eating interventions can improve physical and psychological health outcomes and have lower attrition rates compared to traditional weight loss interventions (Clifford et al., 2015; Gagnon-Girouard et al., 2010; Mensinger et al., 2016; Schaefer & Magnuson, 2014). This work indicates that intuitive eating is novel and should be further explored.

Intuitive Eating Scale

Four primary components of intuitive eating have been recognized: unconditional permission to eat desired food without imposing restrictions, eating for physical rather than

emotional reasons, reliance on and trust in internal hunger and satiety cues to guide eating behavior, and following the needs of one's body to make food choices (Tylka & Kroon Van Diest, 2013). This last component, which was a new addition to the popular Intuitive Eating Scale-2 (IES-2), is distinct from existing assessments of eating styles as it was designed to capture the notion of "gentle nutrition" that balances both health considerations with taste preferences (Barrada, Cativiela, Van Strien, & Cebolla, 2018; Tylka & Kroon Van Diest, 2013). These intuitive eating components were all drawn from the Intuitive Eating text by authors Tribole and Resch (2012). These four components are mostly positively related to one another, in that individuals who are guided by their hunger and satiety cues tend to eat without strict restrictions and refrain from emotional eating. The exception is that the newer "body-food choice congruence" subscale tends to be negatively correlated with the "unconditional permission to eat subscale" (Tylka & Kroon Van Diest, 2013). It may be the case that those individuals who give themselves the freedom to eat all types of foods may not always be guided by the needs of their body (e.g., for energy/stamina). Research is required to differentiate this subscale from more rigid approaches to health, such as orthorexia nervosa. Overall, the four-factor structure of intuitive eating has been supported consistently across studies in a range of different populations.

Correlates of Intuitive Eating

A number of cross-sectional studies have examined intuitive eating's association with a range of physical health and psychosocial variables. Two reviews of this literature (Bruce & Ricciardelli, 2016; Van Dyke & Drinkwater, 2013) and one meta-analysis (Linardon et al., 2021) concluded that intuitive eating was consistently associated with higher body image, self-esteem, body acceptance by others, and emotional functioning (i.e., less depressive symptomatology and negative affect, and healthier emotion management). Furthermore, intuitive eating was correlated

with lower disordered eating and BMI. While the relationship to several other positive correlates was more mixed, there was no evidence of intuitive eating being related to any negative psychological or physical health outcomes. However, many of these studies consisted of all-female, non-Hispanic white college samples, and all were cross-sectional designs. Therefore, while cause and effect conclusions cannot be made, research clearly demonstrates an association between intuitive eating and an impressive list of positive correlates. Additional research appears needed to better understand these associations in more diverse samples.

One of these relationships that has been given particular research attention is the association of intuitive eating with BMI. Correlational studies have shown that higher BMI is related to less intuitive eating. Interestingly, this finding has been conceptualized quite differently by various researchers, with researchers either stressing the role that eating has on BMI, the role BMI has on intuitive eating, or the role of third variables in this complex relationship. Some researchers state that listening to internal cues may be too fused with hedonic signals for some people, which leads individuals to actually develop higher BMIs (Sairanen et al., 2015). Others point to constructs like interoceptive sensitivity (i.e., one's ability to accurately perceive and process bodily sensations) and poor self-regulation as important factors to understand in the relationship between intuitive eating and BMI (Herbert et al., 2013; Ruzanska & Warschburger, 2019). Some researchers have challenged the idea that intuitive eating *causes* changes in weight, and posit that individuals in bigger bodies persistently experience less body acceptance by others. In turn, this impacts body appreciation and eventually negatively impacts their innate ability to eat intuitively (Augustus-Horvath & Tylka, 2011). Overall, studies of BMI and intuitive eating have been largely correlational, so conclusions of causality cannot be made.

Therefore, the relationship between intuitive eating and BMI needs to be examined in longitudinal and experimental designs.

Weight Stigma

Unrealistic body ideals and poor body image initially were highlighted as obstacles to stopping chronic dieting and returning to intuitive eating (Tribole & Resch, 2012). As dietitians, Tribole and Resch (2012) introduced intuitive eating as an alternative eating style upon witnessing many of their clients experience the process of worsening body image and "hitting diet bottom". This occurred after decades of trying a multitude of failed or short-lived diets and consistently regaining all the lost weight. In addition to describing the physical damage caused by this cycle of yo-yo dieting, these authors stated that chronic dieting stemmed from society's unhealthy obsession with thinness. This obsession often took the form of the media conveying the message that thin individuals were happier and "bigger" individuals were lazy, unhappy, and unlovable (Hinman et al., 2015). But such messages often were delivered by family and loved ones as well. In fact, messages from close supporters like mothers and romantic partners have been shown to influence how women regulate their eating and the degree to which they rely on internal cues of hunger (Carbonneau et al., 2015). Additionally, weight-based discrimination from strangers is associated with decreased motivation to engage in healthy behaviors (Vartanian, Pinkus, & Smyth, 2014; Vartanian, Pinkus, & Smyth, 2018).

Experiences of weight stigma are a common, almost daily occurrence for those with overweight and obesity. Weight-based stigma can lead to internalized weight bias; namely, applying negative weight-related stereotypes to oneself and experiencing self-blame and self-judgement regarding weight status. Weight stigma and internalized weight bias have both been shown to have negative effects on disordered eating, quality of life, physical health, and self-

esteem for individuals with overweight/obesity *and* individuals with normal weight (Craven & Fekete, 2019; Lee et al., 2019; Tylka et al., 2014). Additionally, research has shown that internalized weight bias negatively impacts one's ability to eat intuitively. However, self-compassion and willingness to bring a mindful perspective to body image can lessen the negative impact that internalized weight bias has on intuitive eating (Webb & Hardin, 2016). More research needs to be done to understand how a history of weight stigmatization and internalized weight bias impacts an individual's thoughts and emotions surrounding food and eating.

Acceptance Model of Intuitive Eating

The acceptance model of intuitive eating conceptualizes intuitive eating as an innate and inborn tendency, which can then be either hindered or strengthened based on social connections and environment. Avalos and Tylka (2006) originally described this model as being informed by humanistic and objectification theories. The humanistic perspective views intuitive eating as a manifestation of the actualizing tendency individuals have to naturally move towards health. However, the absence of acceptance by others can obstruct this process and lead individuals to rely on external signals to guide eating (e.g., diet plans or observations of how others are eating) as opposed to relying on internal signals of hunger and satiety. Objectification theory describes how women in particular are negatively impacted by society's insistence on objectifying and scrutinizing their bodies. This leads women to internalize these views, thereby seeing their own bodies as objects and striving for a thin-ideal that is unachievable. Self-objectification increases the risk for disordered eating (Tiggemann, 2011). Therefore, the acceptance model of intuitive eating incorporates components of both humanistic and objectification theories in its explanatory model of intuitive eating that takes into consideration the impact of constructs such as body acceptance by others and body appreciation.

This acceptance model was tested initially in college females (Avalos & Tylka, 2006). General social support and acceptance from others was related to women feeling that their bodies were more accepted by those around them. This body acceptance from others was associated with resisting the pressure to take an outsider's perspective of one's body and having more appreciation for one's body. In turn, the more appreciation women had for their bodies, the more likely they were to eat intuitively (Avalos & Tylka, 2006).

This acceptance model has since been replicated in a number of different populations, further bolstering its validity. One study of 18–65-year-old women found support for the acceptance model across age groups, with BMI influencing how much body acceptance women felt from others, and in turn, how likely they were to eat intuitively (Augustus-Horvath & Tylka, 2011). For younger adolescent girls, the acceptance model has been expanded to include the negative influence that social comparisons have on the ability to eat intuitively (Andrew, Tiggemann, & Clark, 2015). For female college athletes, the acceptance model explains how intuitive eating develops (Oh et al., 2012). Interestingly, body acceptance from coaches and teammates appears to be especially important for the ability to eat intuitively. These studies support the utility of the acceptance model in a wide variety of women.

In the first examination of the acceptance model with men, Tylka and Homan (2015) found support for the model across college men and women. Analyses also examined the impact of exercise motives on intuitive eating in this sample of physically active students. Exercising for appearance-based reasons was associated with less intuitive eating in both men and women, whereas functional motives for exercise (e.g., stress management, health, and enjoyment) were associated with individuals feeling more appreciative of their bodies. This is in line with the approach advocated for in intuitive eating programs whereby individuals are advised to find

ways to be physically active that are pleasurable, while deemphasizing the connection with weight loss or mere calorie burning (Tribole & Resch, 2012).

Importantly, while the acceptance model has been supported in a variety of populations, these trait level associations between social support, body acceptance, body appreciation, and intuitive eating have not yet been tested at the momentary or 'state' level. Additionally, the incorporation of exercise motives has not been tested at the momentary level.

Ecological Momentary Assessment

The current study tested the validity of the Intuitive Eating Scale and the acceptance model at the momentary level by using a methodology known as ecological momentary assessment (EMA). EMA is a methodology of naturalistic or real-time data collection where assessments are delivered to participants in their natural environments (Shiffman, Stone, & Hufford, 2008). Typically, these assessments are delivered via a smart phone or mobile device multiple times throughout the day (Heron & Smyth, 2013). Importantly, this methodology offers a number of strengths over more traditional laboratory-based studies, including reduced problems associated with memory and recall, improved ecological validity, and the capability to assess temporal sequences and relationships. Additionally, this methodology has been implemented with increasing frequency in the field of eating disorders and obesity to examine theoretical models of disordered eating (Engel et al., 2016). EMA potentially could make a significant contribution to the study of intuitive eating, as it would capture the antecedents and immediate consequences of episodes of eating in an effort to determine the extent to which the components of intuitive eating are supported.

Given that this methodology is becoming more popular in the field of eating behaviors, it is important to highlight the strengths and weaknesses of EMA studies in this field. In general,

some of the strengths of this body of work to date include high compliance rates (often 80-90%, e.g., Lavendar et al., 2013; Prinsen et al., 2018; Smith et al., 2018), consistent use of appropriate statistics to address the nested nature of EMA data, thorough reporting of assessment schedules, and samples of clinical populations. Limitations of this research area include inconsistent reporting of study design details (compliance rates, compensation information, etc.), a lack of examination of factors contributing to compliance rates, and limited inclusion of males and racially/ethnically diverse samples. Therefore, the current study sought to address some of these limitations by reporting details of study design (e.g., compliance and drop-out rates, compensation, assessment measures), analyzing whether compliance rates are related to any baseline measures, and including males in the sample.

In addition to the standard strengths of EMA studies noted, EMA also has revealed unique relationships in the study of eating behaviors. For example, in an EMA study of dietary restraint in obese adults, momentary relationships were inconsistent with hypotheses based on existing theoretical models and global cross-sectional findings (Pearson et al., 2018). Specifically, restraint was associated with an increased risk for loss of control eating at the global level, but at the momentary level restraint played a more protective role in reducing loss of control eating. Additionally, a meta-analysis of 36 EMA studies did not find full support for the popular affect regulation model of binge eating (Haedt-Matt & Keel, 2012), and a 2011 meta-analysis (Haedt-Matt & Keel) of EMA studies called into question the findings from cross-sectional studies and retrospective reports of associations between hunger and binge eating.

In an innovative use of EMA, the ecological validity of the widely used Dutch Eating Behavior Questionnaire was tested and mostly supported by examining whether subscale scores were associated with variables measured in real time in an individual's natural daily environment

(Mason et al., 2019). Theoretical models of trait level associations also have been tested at the state level using EMA, and the findings have increased our understanding of body dissatisfaction, body image, and the development of bulimic symptomology (Colautti et al., 2011; Fuller-Tyszkiewicz, 2019; Holmes et al., 2014). These studies highlight the need for examining theories and cross-sectional findings at the momentary level.

Importantly, there appear to be no studies that have examined intuitive eating constructs utilizing EMA. Studying intuitive eating at the momentary level will allow one to determine how trait level reports of eating style (i.e., baseline total and subscale scores on the IES-2) relate to daily eating behavior (e.g., thoughts, emotions, and behaviors before and after eating). If intuitive eating as measured by the IES-2 is predictive of state level reports, then the ecological validity of the IES-2 would be supported. For example, the IES-2's subscale "eating for physical rather than emotional reasons" captures the ability to eat when physically hungry (instead of in response to negative emotions). Therefore, the ecological validity of this IES-2 subscale would be supported if it was associated with EMA ratings of less negative affect prior to eating and less eating in response to stress when not physically hungry. These findings would not be possible to obtain using cross-sectional or laboratory designs.

The Current Study

Given that no studies appear to have examined intuitive eating at the momentary level, the primary aims of current study were to: 1) examine the ecological validity of a commonly used measure of intuitive eating, the Intuitive Eating Scale- 2 (IES-2; Tylka & Kroon Van Diest, 2013), 2) test whether key tenets of intuitive eating (less preoccupation/guilt/rules surrounding food and more enjoyment of food) are present at the momentary level, 3) test the acceptance model of intuitive eating at the momentary level, 4) test an expanded acceptance model of

intuitive eating that incorporates exercise motives at a momentary level, and 5) examine how experiences of weight stigma and internalized weight-bias relate to intuitive eating at the momentary level. The study recruited college men and women to participate in an online baseline assessment of intuitive eating and related constructs, followed by a 7-day EMA protocol. During these seven days, participants completed three types of recordings: before eating recordings (participants self-initiated these assessments prior to eating), after eating recordings (participants self-initiated these assessments after eating), and random recordings (assessments texted to participants at 5 semi-random times throughout the day). Assessments contained EMA-adapted measures of affect, intuitive eating, and related constructs. Finally, participants were invited to complete a post-study assessment regarding their experiences in the study and their perceptions of intuitive eating.

Aims

1. **Aim:** To examine whether trait level intuitive eating (measured by the IES-2 at baseline) is related to state level intuitive eating (measured at the before and after eating recordings). If so, the ecological validity of the IES-2 would be supported (e.g., see a test of such ecological validity in Mason et al., 2019).
    a. **Hypothesis:** IES-2 scores at baseline will predict intuitive eating at the state level.
    b. **Hypothesis:** IES "unconditional permission to eat" (IES-UPE) subscale scores at baseline will predict IES-UPE scores at the state level.
    c. **Hypothesis:** IES "eating for physical rather than emotional reasons" (IES-EPR) subscale scores at baseline will predict IES-EPR scores at the state level.

d. **Hypothesis:** IES "reliance on hunger and satiety cues" (IES-RHSC) subscale scores at baseline will predict IES-RHSC scores at the state level.

e. **Hypothesis:** IES "body-food choice congruence" (IES-BFCC) subscale scores at baseline will predict IES-BFCC scores at the state level.

2. **Aim:** Some of the key tenets of intuitive eating involve less preoccupation/guilt/rules surrounding food, and a focus on enjoyment of eating without using food as an unhealthy coping mechanism (Tribole & Resch, 2012; Tylka & Van Diest, 2013). Therefore, trait level intuitive eating (measured by the IES-2 at baseline) should broadly be associated with the following state level variables (measured at the random recordings): less emotional eating (Multidimensional Mood Questionnaire-MDMQ), less guilt following eating (Positive and Negative Affect Schedule-PANAS-X, guilt subscale), more enjoyment of tastes of food ("I enjoyed the taste of the food", item from Mason et al., 2019), and fewer eating restrictions and regret ("I shouldn't eat this food", item from Mason et al., 2019).

   a. **Hypothesis:** IES-2 and "eating for physical rather than emotional reasons" (measured by IES-EPR at baseline) scores will be positively correlated with positively valanced affect before eating (measured by MDMQ at the before eating recordings).

   b. **Hypothesis:** IES-2 and "unconditional permission to eat" (measured by IES-UPE at baseline) scores will be associated with less guilt after eating (measured by PANAS-X at the after eating recordings).

   c. **Hypothesis:** IES-2, "unconditional permission to eat" (measured by IES-UPE at baseline), and "body-food choice congruence" (measured by IES-BFCC at

baseline) scores will be associated with higher taste enjoyment scores before and after eating (measured by "I will enjoy the taste of this food" at the before eating recordings and "I enjoyed the taste of the food" at the after eating recordings).

d. **Hypothesis:** IES-2 and "unconditional permission to eat" (measured by IES-UPE at baseline) subscale scores will be associated with lower ratings of eating restrictions and regret (measured by "I shouldn't eat this food" at the before eating recordings and "I shouldn't have eaten what I ate" at the after eating recordings).

e. **Hypothesis:** IES-2 total and "unconditional permission to eat" (measured by IES-UPE at baseline) subscale scores will be associated with overall lower ratings of eating restrictions and regret (measured by "I shouldn't eat this food" at the before eating recordings and "I shouldn't have eaten what I ate" at the after eating recordings, item from Mason et al., 2019).

3. **Aim:** Test the acceptance model of intuitive eating at a momentary level (Avalos & Tylka, 2006; Augustus-Horvath & Tylka, 2011). Examine how acceptance model constructs as measured in previous studies (Social Provisions Scale- SPS; Body Acceptance by Others Scale- BAOS; Objectified Body Consciousness Scale-OBC; Body Appreciation Scale 2-BAS-2) relate to intuitive eating.

   a. **Hypothesis:** State levels of "perceived social support" (SPS), "perceived body acceptance by others" (BAOS), "resisting taking an outsider's perspective of one's body" (OBC), and "body appreciation" (BAS-2) measured at random

recordings will predict “intuitive eating” (measured at the next before eating recording).

4. **Aim:** Test an expanded acceptance model of intuitive eating which incorporates exercise motives at a momentary level (Tylka & Homan, 2015).
    a. **Hypothesis:** “Enjoyment/function motives for exercise” (Function of Exercise Scale- FES-enjoyment/function subscale) scores at baseline will predict “enjoyment/function motives for exercise” scores at the state level (measured at the random recordings when someone endorses “yes” to the question: “Did you engage in physical activity/exercise since you last filled out an assessment?”).
    b. **Hypothesis:** “Appearance/weight motives for exercise” (FES-appearance/weight motives for exercise subscale) scores at baseline will predict “appearance/weight motives for exercise” scores at the state level (measured at the random recordings when someone endorses “yes” to the question: “Did you engage in physical activity/exercise since you last filled out an assessment?”).
    c. **Hypothesis:** Higher state levels of “resisting taking an outsider’s perspective of one’s body” (measured by OBC at the random recordings) will predict lower state levels of “appearance motives for exercise” (measured by FES at the next random recording when someone endorses “yes” to the question: “Did you engage in physical activity/exercise since you last filled out an assessment?”).

d. **Hypothesis:** Higher state levels of "appearance/weight motives for exercise" (measured by FES at the random recordings when someone endorses "yes" to the question: "Did you engage in physical activity/exercise since you last filled out an assessment?") will predict lower state level "body appreciation" (measured by BAS-2 at the next random recording).

e. **Hypothesis:** Higher state levels of "body appreciation" (measured by BAS-2 at the random recordings) and lower "appearance/weight motives for exercise" (measured by FES at the random recordings when someone endorses "yes" to the question: "Did you engage in physical activity/exercise since you last filled out an assessment?") will predict higher state level "intuitive eating" (measured at the next before eating recording).

5. **Aim:** Examine how experiences of weight stigma and internalized weight bias are related to intuitive eating (Craven & Fekete, 2019; Webb & Hardin, 2016).

    a. **Hypothesis:** Both trait level "weight stigma" (Stigmatizing Situations Inventory-SSI) and trait level "internalized weight bias" (Weight Bias Internalization Scale-WBIS) measured at baseline will be associated with lower state levels of intuitive eating (measured at the before and after eating recordings).

Chapter 2 Method

Participants

The current study recruited a sample of college students. Since intuitive eating is not centered in one gender and the IES has been found to be invariant across gender, both men and women were recruited. The goals of the study guided the inclusion criteria to be broad to promote a more general understanding of how intuitive eating functions. Inclusion criteria consisted of: 1) being 18 years or older, and 2) owning a smartphone. Exclusion criteria for the study were: 1) having a current or past eating disorder diagnosis, 2) being pregnant, 3) following dietary restrictions for health reasons (e.g., diabetes), and 4) past weight loss/gastric bypass surgeries. This study was approved by the University of New Mexico IRB.

A total of 104 participants completed the full protocol including baseline assessment, EMA procedure, and post-study assessment. The mean age for this final sample was 24.32 years old (*SD* = 8.41, range 18-57). The mean BMI for the sample was 26.28 (*SD* = 6.98, range 17.37-62.72). Regarding weight categories, 4.9% of the sample were underweight (BMI <18.5, *n* = 5), 45.1% were of normal weight (BMI = 18.5-25, *n* = 46), 30.4% were overweight (BMI 25-30, *n* = 31), and 19.6% were obese (BMI >30, *n* = 20). As for gender breakdown, the sample was 87.5% female (*n* = 91), 10.6% male (*n* = 11), and 1.9% gender variant/non-conforming (*n* = 2). The racial/ethnic identity of the sample was: 46.2% Hispanic (any race; *n* = 48), 42.3% non-Hispanic white (*n* = 44), 5.8% Asian (*n* = 6), 2.9% Black/African American (*n* = 3), 1.9% American Indian/Alaska native (*n* = 2), and 1.0% mixed race (*n* = 1) (note any percentages not adding up to exactly 100 is due to rounding).

Measures

Baseline Measures

Demographics and Intuitive Eating. These measures were selected to better characterize the sample demographics and eating styles (including intuitive eating levels).

Demographics. Participants were asked to report their age, weight, height, race/ethnicity, family income, education, marital status, and current/past eating disorder diagnosis.

Intuitive Eating Scale (IES-2; Tylka & Kroon Van Diest, 2013). This 23-item questionnaire of intuitive eating is rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores reflecting higher levels of intuitive eating (Appendix A). In addition to the total score (α = .87), this scale contains four subscales capturing different aspects of intuitive eating: "unconditional permission to eat" (IES-UPE, six items; α = .74), "eating for physical rather than emotional reasons" (IES-EPR, eight items; α = .88), "reliance on hunger and satiety cues" (IES-RHS, six items; α = .85), and "body-food choice congruence" (IES-BFCC, three items; α = .90). The IES-2 has been shown to have good internal consistency in college samples. It has been used in cross-cultural samples, such as a Black sample in the U.S. (Khalsa et al., 2019), and has been adapted for other languages, including Turkish (Bas et al., 2017), French-Canadian (Carbonneau et al., 2016), and Portuguese (Guarte, Gouveia, & Mendes, 2016). In the only study to investigate this measure in a Hispanic sample, the factor structure was mostly supported. However, the UPE subscale did not fit well in this sample of predominantly Cuban-Americans; a sample that was < 2% Mexican-American (Saunders, Nichols-Lopez, & Frazier, 2017). The IES- 2 also has been found to be invariant across men and women (Camilleri et al., 2015; Tylka & Kroon Van Diest, 2013). In college samples of men and women, test-retest reliability and validity (i.e., discriminant and construct) were upheld (Tylka & Kroon Van Diest, 2013).

Dutch Eating Behaviour Questionnaire (DEBQ; van Straien et al., 1986). This 29-item questionnaire of different eating styles assesses levels of: dietary restraint (10 items, e.g., "Do you try to eat less at mealtimes than you would like to eat?"; α = .89), emotional eating (9 items, e.g., "Do you have a desire to eat when you are irritated?"; α = .95), and external eating (10 items, e.g., "If food tastes good to you, do you eat more than usual?"; α = .82, Appendix B). Items are each rated on a scale from 1 (*never*) to 5 (*very often*). Higher scores indicate a stronger identification with that eating style. Reliability and validity of the scale are acceptable (van Strien et al., 1986). The DEBQ has been examined in EMA studies (Mason et al., 2019).

Acceptance Model and Expanded Acceptance Model of Intuitive Eating. To test the acceptance model and expanded acceptance model of intuitive eating, measures were selected based on their use in past studies examining these models (Avalos & Tylka, 2006; Tylka & Homan, 2015).

Social Provisions Scale (SPS; Cutrona & Russell, 1987). This 24-item questionnaire measures perceived level of social support (α = .86; Appendix C). The level of acceptance within an individual's relationships (e.g., "I have close relationships that provide me with a sense of emotional security and well-being") is measured on a scale from 1 (*strongly disagree*) to 4 (*strongly agree*). Higher scores on the total score indicate more overall support. The reliability and validity of the measure has been supported (Cutrona & Russell, 1987). This measure was used by Augustus-Horvath and Tylka (2011) to test the acceptance model of intuitive eating.

Body Acceptance by Others Scale (BAOS; Avalos & Tylka, 2006). This measure contains 10 items that assess the overall level of acceptance individuals feel regarding their body shape and weight (α = .88; Appendix D). Specifically, the same two items (i.e., "I've felt acceptance from __ regarding my body shape and/or weight" and "__ have/has sent me the

message that my body shape and weight are fine") are presented for five sources (i.e., friends, family, partners/people dated, society, and the media). Items are each rated from 1 (*never*) to 5 (*always)*. Responses to the 10 items are averaged to form a total score, with higher scores representing higher perceived acceptance of body shape and weight. Support has been found for this measure's internal consistency reliability and convergent validity (Avalos & Tylka, 2006).

Objectified Body Consciousness Scale- Surveillance Subscale (OBC; McKinley & Hyde; 1996). This 8-item subscale is a measure of resisting an observer's perspective of the body; namely, emphasizing how the body feels/functions instead of how it appears to others (α = .85; Appendix E). Following Tylka and Homan's (2015) use of this scale, the same adaptations were made in reverse scoring items so that higher scores on all eight items represent more resistance to adopting an observer's perspective. Items are each rated from 1 (*strongly disagree*) to 7 (*strongly agree)*. The measure has demonstrated acceptable levels of internal consistency and construct validity (McKinley & Hyde, 1996).

Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015). This 10-item measure assesses body appreciation (e.g., "I take a positive attitude towards my body"; α = .95, Appendix F). Each item is rated from 1 (*never*) to 5 (*always*), with higher scores indicating more appreciation for one's body. This measure is invariant across sex and has evidenced construct validity and internal consistency and stability in samples of men and women (Tylka & Wood-Barcalow, 2015).

The Function of Exercise Scale (FES; DiBartolo et al., 2007). This 16-item measure of exercise motives contains two subscales: appearance/weight (9 items, e.g., "I exercise to work off unwanted calories", "I exercise because I want to be thin"; α = .88) and health and enjoyment/function (7 items, e.g., "I really have fun when I'm exercising", "I want to be strong

and healthy", "Exercise releases tension"; α = .78, Appendix G). Each item is rated from 1 (*do not agree*) to 7 (*strongly agree*). Item responses within a subscale are averaged, with higher scores indicating greater motivation. Among college men and women, support has been found for this measure's internal consistency reliability and convergent validity (DiBartolo et al., 2007).

Weight Stigma and Internalized Weight Bias. Two measures of weight stigma and internalized weight bias were administered to determine how these constructs relate to intuitive eating.

Stigmatizing Situations Inventory-Brief (SSI-B; Vartanian, 2015). This 10-item measure assesses global experiences with weight stigma (e.g., "being stared at in public", "having family members feel embarrassed by you or ashamed of you"; α = .87, Appendix H). Each item is rated from 0 (*never*) to 9 (*daily*). Responses are averaged, with higher scores representing greater experience with stigma. The scale has been shown to have good reliability and validity that is comparable with that of the original 50-item measure (Vartanian, 2015).

Weight Bias Internalization Scale- Modified (WBIS-M; Pearl & Puhl, 2014). This 11-item scale measures internalization of weight bias on a seven-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*; α = .94, Appendix I). The WBIS-M is a modification of the original scale (Durso & Latner, 2008) made to be applicable to samples of diverse body weights (e.g., "As an overweight person, I feel that I am just as competent as anyone" was reworded to read "Because of my weight, I feel that I am just as competent as anyone"). The WBIS-M has been found to have strong construct validity and high internal consistency (Pearl & Puhl, 2014).

EMA Measures

When possible, questions in past EMA studies were utilized as the EMA measures. When this was not possible, items were pulled from validated assessments based on high factor loadings in past psychometric evaluations, while also considering appropriateness for an EMA setting. Participants completed the before eating recordings and the after eating recordings by self-initiating assessments on their phones pre- and post-eating episode. Questions on these assessments were similar except for the necessary verb tense/wording changes (e.g., before eating- "I will enjoy the taste of this food"; after eating- "I enjoyed the taste of the food"). Guilt was assessed only after eating due to study hypotheses regarding guilt following eating episodes. Additionally, participants completed five daily random recordings sent to their phones throughout the day. Questions contained four constructs also included in the before/after eating recordings (affect, craving, hunger, and context). Additional questions were included to test the acceptance model of intuitive eating (perceived social support, body acceptance by others, resisting an observer's perspective of the body, body appreciation, body dissatisfaction) and to investigate the expanded acceptance model of intuitive eating (exercise, exercise time, and exercise motives).

Table 1

EMA Measures

EMA Measures: **1. Before Eating Recordings, 2. After Eating Recordings, 3. Random Recordings**			
Construct	**Scale name/question**	**Items**	**Additional information**
1. Before Eating Recordings			
Intuitive Eating	IES-2 (Tylka & Kroon Van Diest, 2013)	8	2 items from each of the 4 subscales of the IES-2 (based on highest factor loadings and relevance for EMA context)
Affect	Six-item short scale-Multidimensional Mood Questionnaire (MDMQ; Steyer et al., 1997; Wilhelm & Schoebi, 2007). At	6	(Wilhelm & Schoebi, 2007, subscales: calmness, valence, energetic arousal)

	this moment I feel: tired–awake, content–discontent, agitated—calm, full of energy—without energy, unwell—well, and relaxed—tense		
Craving	"Do you have a desire to eat something tasty right now?" not at all- very much	1	(Reichenberger et al., 2018)
Hunger	"How hungry are you right now?" Not at all-very much	1	(Reichenberger et al., 2018)
Taste	"I will enjoy the taste of this food"	1	(Mason et al., 2019)
Permission	"I shouldn't eat this"	1	(Mason et al., 2019)
Context	"Are you currently alone?" yes-no, "Where are you currently?" home, work, school, out-other	2	
2. After Eating Recordings			
Intuitive Eating	IES-2 (Tylka & Kroon Van Diest, 2013)	8	2 items from each of the 4 subscales of the IES-2 (based on highest factor loadings and relevance for EMA context)
Affect	Six-item short scale-Multidimensional Mood Questionnaire (MDMQ; Steyer et al., 1997; Wilhelm & Schoebi, 2007). At this moment I feel: tired–awake, content–discontent, agitated—calm, full of energy—without energy, unwell—well, and relaxed—tense	6	(Wilhelm & Schoebi, 2007, subscales: calmness, valence, energetic arousal)
Affect- guilt	PANAS-X (guilt subscale)- guilty, ashamed, blameworthy, angry at self, disgusted with self, dissatisfied with self	6	(Used in EMA context- De Young et al., 2013)
Craving	"Did you eat something you had a craving or desire to eat?"	1	(Reichenberger et al., 2018)
Hunger	"How hungry are you right now?" Not at all-very much	1	(Reichenberger et al., 2018)
Taste	"I enjoyed the taste of the food"	1	(Mason et al., 2019)
Permission	"I shouldn't have eaten what I ate"	1	(Mason et al., 2019)
Context	"Are you currently alone?" yes-no, "Where are you currently?" home, work, school, out-other	2	
3. Random Recordings			

Affect	Six-item short scale-Multidimensional Mood Questionnaire (MDMQ; Steyer et al., 1997; Wilhelm & Schoebi, 2007). At this moment I feel: tired–awake, content–discontent, agitated—calm, full of energy—without energy, unwell—well, and relaxed—tense	6	(Wilhelm & Schoebi, 2007, subscales: calmness, valence, energetic arousal)
Craving	"Do you have a desire to eat something tasty right now?" not at all- very much	1	(Reichenberger et al., 2018)
Hunger	"How hungry are you right now?" Not at all-very much	1	(Reichenberger et al., 2018)
Context	"Are you currently alone?" yes-no, "Where are you currently?" home, work, school, out-other	2	
Perceived social support	Social Provisions Scale (SPS; Cutrona & Russell, 1987) "There are people I can depend on to help me if I really need it" "There is someone I could talk to about important decisions in my life"	2	2 items from the SPS (based on highest factor loadings and relevance for EMA context)
Body acceptance by others	Body acceptance by others scale (BAOS; Avalos & Tylka, 2006) "I've felt acceptance from others regarding my body shape and/or weight" "Others have sent me the message that my body shape and weight are fine"	2	2 items from the BAOS (based on highest factor loadings and relevance for EMA context)
Resisting an observer's perspective of the body	Objectified Body Consciousness Scale- Surveillance Scale (OBS; McKinley & Hyde, 1996) "I think more about how my body feels than how my body looks" "I worry about how I look to other people"	2	2 items from the OBS (based on highest factor loadings and relevance for EMA context)
Body appreciation	Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015) "I feel a positive attitude towards my body" "I feel love for my body"	2	2 items from the BAS-2 (based on highest factor loadings and relevance for EMA context)
Body dissatisfaction	Body Image States Scale (BISS; Cash, Fleming Alindogan, Steadman, & Whitehead, 2002)	6	(BISS has been used for EMA contexts- Fuller-Tyszkiewicz et al., 2013)
Exercise	"Did you engage in physical activity/exercise since you last filled out an assessment? (examples-walking, biking, running, dancing,	1	(Adapted from- Spook, Paulussen, Kok, & Empelen, 2013)

	etc.)"		
Exercise time	(if exercise yes)- "For how many minutes?"	1	
Exercise motives	(if exercise yes)- The Function of Exercise Scale (FES; DiBartolo et al., 2007) Appearance subscale: "I exercised to work off unwanted calories" "I exercised because I want to be thin", "I exercised for weight and appearance reasons", Health and enjoyment/ functional subscale: "I liked the challenge" "I really had fun when I was exercising" "I exercised for health and enjoyment reasons"	6	6 items adapted from the FES (2 items from the appearance subscale, 2 items from the health and enjoyment/functional subscale, and 2 items based on subscale themes; based on highest factor loadings and relevance for EMA context)

Post-Study Assessment Measures

Marlowe-Crowne Social Desirability Scale -Ballard's 11 item version (Ballard, 1992; Crowne & Marlowe, 1960). This 11-item measure assesses social desirability with true or false statements (e.g., "No matter who I'm talking to, I'm always a good listener"; α = .42). Ballard's 11-item version of the scale has been shown to have better psychometric qualities compared to the full scale and other short versions (Loo & Loewen, 2004). Additionally, the longer version of this scale has been used in previous EMA studies to better understand patterns of EMA responses (Stone et al., 1998).

EMA & Intuitive Eating Evaluation. Participants were asked to report on their experience of EMA procedures adapted from four questions asked in Engel and colleagues (2005; e.g., "How easy was monitoring"). They also were asked questions regarding measurement reactivity (e.g., "Do you think you've changed your eating this past week because of the study?", "Was this past week typical of your eating patterns?", "Do you think your responses were private?").

Additionally, participants were given the following description of intuitive eating: "This style of eating involves following internal signals for hunger and fullness to guide eating choices.

Those who eat in this way are willing to eat desired foods when hungry without restrictions (e.g., eating rules or dieting plans). Additionally, they eat when physically hungry instead of in response to negative/strong emotions. They trust their hunger and fullness signals and follow the needs of their bodies to make food choices." Participants were asked to rate the following four statements, "I could follow this style of eating", "This style of eating appeals to me", "I would like to follow this style of eating", and "I eat this way currently". These items were rated from 1 (*Not at all*) to 7 (*Extremely*). Participants were asked to respond to three open-ended questions about intuitive eating as well: "What are some of the things that make you feel able to follow this way of eating?", "What are some of the things that make you feel unable to follow this way of eating?", and "Would you consider following this eating pattern long term?". All intuitive eating questions were adopted from Barraclough et al. (2019) and McLaughlin, Belon, Smith, and Erickson (2015).

Procedure

Recruitment Strategy

Participants were recruited from introductory psychology and other psychology courses. They received class credit for completion of each portion of the baseline, EMA, and post-study assessment. In addition to course credit, participants were entered into a lottery to win one of five $20 Visa gift cards if they completed the post-study assessment and at least 14 before/after eating EMA prompts, and if they had >80% compliance to EMA prompts (signal-contingent) across the course of the study (Smith et al., 2019).

Baseline Assessment

Before completing the baseline assessment measures online, participants were given information about the study and provided consent to proceed. Upon consenting, participants were

presented with a video detailing the EMA procedures. After watching the video, they were given access to the baseline assessment measures.

EMA

For the EMA portion of the study, participants completed the before eating recordings, the after eating recordings, and random recordings (Wheeler & Reis, 1991), and all data was collected using the Real-Time Assessment In the Natural Environment (ReTAINE) system (http://retaine.org/). For random recordings, participants received five daily text messages containing hyperlinks that directed them to complete online surveys. Participants indicated what time they wished to start/stop receiving texts (8am-10pm, 9am-11pm, or 10am-12am), and received messages at semi-random times within this window that were at least 120 minutes apart. Additionally, they were asked to complete the before eating and after eating recordings as soon as possible before and after eating.

The first day of the EMA portion of the study was intended to familiarize participants with the study procedure. It was considered a practice day because although participants received five daily prompts for completing surveys and were asked to complete surveys before and after eating (in accordance with the actual study procedures), all surveys were on topics unrelated to the study surveys. For example, questions about study habits included, “Do you feel excited about what you are studying?”, “Do you procrastinate studying?”. At the end of the practice day, participants were provided with feedback about their response rate. If they completed at least 60% of random recordings (i.e., at least 3 recordings) and completed at least two of the before or after eating recordings, they were enrolled in the seven day portion of the study. If they did not meet these response rates, participants had the option to enroll in a second practice day to

increase their response rates. Participants had one hour to respond to message prompts and were not sent reminder messages.

Posttest

Following the 7-day study period, participants were sent links and asked to take the posttest assessment online. Participants were sent debriefing materials.

Data Analysis

The data were analyzed where appropriate using mixed linear models with EMA recordings nested within each individual participant to account for the repeated nature of the design. Where appropriate, EMA data were collapsed to obtain mean levels of variables to determine if mean levels were significantly related to baseline values.

For all hypotheses regarding the relationship between trait levels and state levels of intuitive eating, correlations were used to test if there was a significant relationship between trait intuitive eating at baseline and mean state level scores of intuitive eating (Aim 1, hypotheses a-e). For all hypotheses regarding the relationship between intuitive eating and emotional eating, guilt, eating restrictions, and enjoyment of food, correlations also were used between trait intuitive eating at baseline and mean state level scores of respective scales/items (Aim 2, hypotheses a-d).

To test the acceptance model of intuitive eating (Aim 3), mixed linear models were utilized to test whether four predictors (measured in the moment at a random recording) predicted “intuitive eating” (measured at the next before eating recording).

To test the expanded acceptance model of intuitive eating (Aim 4), correlations were used to determine if there was a significant relationship between trait “appearance/weight motives for exercise” at baseline and state “appearance/weight motives for exercise” scores across EMA

recordings (hypotheses 4a & 4b). For hypotheses 4c-4e, specific hypothesized pathways in the expanded acceptance model were tested using mixed linear models to determine whether identified constructs (measured at a random recordings: “resisting taking an outsider’s perspective of one’s body”, “appearance/weight motives for exercise”, and “body appreciation”) were significant predictors of dependent variables (measured at the very next random recording: “appearance motives for exercises”, “body appreciation”, or measured at the next before eating recording: “intuitive eating”).

To test how weight stigma and internalized weight bias were related to intuitive eating (Aim 5), correlations were used to determine if there was a significant relationship between both trait “weight stigma” (SSI) and trait “internalized weight bias” (WBIS-M) and the mean state level scores of “intuitive eating” (IES-2).

Chapter 3 Results

Participant Flow through Study

A total of 168 participants completed the baseline assessment measures. Based on inclusion/exclusion criteria, 11 participants did not qualify for the study: 45% had a past or current eating disorder (n = 5), 27% had received weight loss surgery (n =3), and 27% were pregnant (n =3). Following the baseline assessment completion, 157 participants were enrolled into an EMA practice day. Based on practice day compliance levels, 66% (n =104) had high compliance and qualified for the full week of EMA. When comparing those who qualified for the full week of EMA to those who did not qualify, there were no differences found for BMI (t(155) = .72, p = .48), age (t(155) = .08, p = .94), ethnicity (χ^2 (1, N = 157) = 1.01, p = .31), gender (χ^2 (2, N = 157) = 1.64, p = .441), or intuitive eating scores on the IES (t(155) = 1.20, p = .23). Of note, 87% of the sample (n =90) qualified on their first practice day and 13% of the sample (n = 14) qualified on their second practice day attempt. Following the full week of EMA, 100% of participants (n = 104) completed the post-study assessment.

Compliance

Compliance rates for the EMA portion of the study are presented in Table 2. Participants completed an average of 6.98 (SD = 2.76) surveys per day and had a 68% compliance rate to random recordings. The number of surveys completed was not related to BMI (r (102) = 0.01, p = .89), age (r (104) = 0.19, p = .06), ethnicity (t(102) = .20, p = .84), gender (t(100) = -.70, p = .49), or intuitive eating scores on the IES (r (104) = -0.03, p = .80).

Table 2

EMA Compliance

	Total number of recordings	Range	*M (SD)*	Daily *M (SD)*	% Compliance rate
Before eating	1369	0-39	13.16 (7.50)	1.88 (1.07)	
After eating	1213	0-32	11.66 (6.57)	1.67 (0.94)	
Random	2496	1-34	24.02 (7.76)	3.43 (1.11)	68.57
All surveys	5078	1-97	48.85 (19.31)	6.98 (2.76)	

Aim 1: Ecological Validity of IES-2

To determine how trait level intuitive eating (i.e., reported on IES-2 at baseline) related to someone's average state level of intuitive eating (i.e., reports made during the week of EMA on items from the IES-2), a series of correlations were run. As predicted (Hypotheses1a-1e), IES-2 total and all subscale scores at baseline were significantly correlated with state levels of intuitive eating, supporting the ecological validity of the IES-2 (see Tables 3 - 7).

Comparing correlations before and after eating

The next step was to better understand how trait level intuitive eating (measured at baseline) related to both the before eating and after eating reports. Therefore, a series of z tests were conducted to determine if the relationship differed between 1) baseline IES and IES before eating, and 2) baseline IES and IES after eating (recommended *Z* statistic from Meng, Rosenthal, & Rubin used for all comparisons, for more information see: Meng et al., 1992; Silver et al., 2006).

The correlation between IES-total score at baseline and before eating was significantly stronger than after eating, suggesting that one's trait level of intuitive eating is more strongly related to attitudes before eating compared to after eating, $z = 3.65$, $p < .001$. The correlation

between “reliance on hunger and satiety cues” (IES-RHS) at baseline and “reliance on hunger and satiety cues” (IES-RHS) before eating was stronger than after eating, suggesting that one’s global report of reliance on hunger and satiety cues is more strongly associated with reports prior to eating as opposed to after eating, $z = 3.32$, $p < .001$. The correlation between “body-food choice congruence” (IES-BFCC) at baseline and “body-food choice congruence” (IES-BFCC) before eating was stronger than after eating, suggesting that one’s global report of following the body’s needs to make food choices is more strongly related to attitudes prior to eating as opposed to after eating, $z = 2.39$, $p = .02$. Correlations did not differ for the “unconditional permission to eat” (IES-UPE, $z = 1.49$, $p = .14$) and the “eating for physical rather than emotional reasons” (IES-EPR, $z = .51$, $p = .61$). Overall, these findings suggest that while intuitive eating attitudes are generally related to attitudes both before and after eating, this connection is stronger before eating.

Table 3

Descriptive Statistics and Correlations for IES-2 at State and Trait Levels

	M	*SD*	*1*	2	3	4
1. IES-total	3.37	.57	-			
2. State IES-total	3.74	.50	.71**	-		
3. State IES-total before eating	3.74	.52	.73**	.99**	-	
4. State IES-total after eating	3.77	.47	.65**	.99**	.96**	-

Note. IES = Intuitive Eating Scale 2.

**$p < .01$.

Table 4

Descriptive Statistics and Correlations for IES-UPE at State and Trait Levels

	M	*SD*	*1*	2	3	4
1. IES-UPE	3.54	.72	-			
2. State IES-UPE	3.64	.67	.58**	-		
3. State IES-UPE before eating	3.62	.71	.60**	.99**	-	
4. State IES-UPE after eating	3.69	.66	.55**	.97**	.93**	-

Note. IES = Intuitive Eating Scale 2.

**$p < .01$.

Table 5

Descriptive Statistics and Correlations for IES-EPR at State and Trait Levels

	M	*SD*	*1*	2	3	4
1. IES-EPR	3.16	.87	-			
2. State IES-EPR	3.98	.90	.62**	-		
3. State IES-EPR before eating	3.95	.92	.63**	.99**	-	
4. State IES-EPR after eating	4.02	.87	.61**	.99**	.96**	-

Note. IES = Intuitive Eating Scale 2.

**$p < .01$.

Table 6

Descriptive Statistics and Correlations for IES-RHS at State and Trait Levels

	M	*SD*	*1*	2	3	4
1. IES-RHS	3.49	.80	-			
2. State IES-RHS	3.85	.77	.67**	-		
3. State IES-RHS before eating	3.87	.81	.69**	.99**	-	
4. State IES-RHS after eating	3.87	.71	.60**	.98**	.94**	-

Note. IES = Intuitive Eating Scale 2.

***p* < .01.

Table 7

Descriptive Statistics and Correlations for IES-BFCC at State and Trait Levels

	M	*SD*	*1*	2	3	4
1. IES-BFCC	3.34	.99	-			
2. State IES-BFCC	3.49	.66	.56**	-		
3. State IES-BFCC before eating	3.51	.66	.60**	.96**	-	
4. State IES-BFCC after eating	3.49	.70	.50**	.97**	.88**	-

Note. IES = Intuitive Eating Scale 2.

***p* < .01.

Aim 2: Intuitive Eating's Relationship to Key Tenets

A series of correlations were run to better understand how intuitive eating (measured at baseline) is related to emotional eating, guilt following eating, enjoyment of tastes of food, and eating restrictions (measured at the before and after eating recordings).

Hypothesis 2a: Affect

Intuitive eating involves eating in response to hunger and satiety cues as opposed to eating in response to strong negative emotions. Partially in line with hypotheses, IES-total was associated with higher valence moods at the before eating time points, while "eating for physical rather than emotional reasons" (IES-EPR) was not related to the before eating affect (see Table 8). These findings suggest that while intuitive eating broadly might be associated with more positive affect prior to eating, the tendency in particular to eat when physically hungry is not related to positive or negative affect prior to eating.

Table 8

Correlations for IES-total, IES-EPR, and MDMQ Before Eating

	1	2	3
1. IES-total	-		
2. IES-EPR	.81**	-	
3. MDMQ before eating	.26**	.09	-

Note. IES = Intuitive Eating Scale 2, MDMQ = Multidimensional Mood Questionnaire.

**$p < .01$

Hypothesis 2b: Guilt After Eating

Another key tenet of intuitive eating is the idea that individuals can eat desired foods without feeling bad or guilty afterwards. As hypothesized, IES-total and "unconditional permission to eat" (IES-UPE) scores were associated with significantly less guilt following eating (see Table 9).

Table 9

Correlations for IES-total, IES-UPE, and Guilt After Eating

	1	2	3
1. IES-total	-		
2. IES-UPE	.49**	-	
3. Guilt after eating	-.25*	-.25*	-

Note. IES = Intuitive Eating Scale 2, Guilt after eating = PANAS-guilt subscale.

* $p < .05$. ** $p < .01$.

Hypothesis 2c: Taste Enjoyment

A key principle of intuitive eating involves the rediscovery of the enjoyment of tastes and food generally. In line with this principle, it was hypothesized that intuitive eating would be associated with more taste enjoyment. Results revealed partial support for this hypothesis. IES-total was only associated with taste enjoyment scores before eating and was not significantly associated with taste enjoyment scores after eating or combined (i.e., before and after eating). "Unconditional permission to eat" (IES-UPE) was associated with higher taste enjoyment scores before eating, after eating, and combined. Finally, "body-food choice congruence" (IES-BFCC) was not associated with taste enjoyment scores before eating, after eating, or combined (See Table 10). Therefore, not all components of intuitive eating were equally related to taste enjoyment ratings, and it appeared that the tendency to eat without restrictions had the strongest relationship to taste enjoyment.

Table 10

Correlations for IES-total, IES-UPE, IES-BFCC, and Enjoy Taste

	1	2	3	4	5	6
1. IES-total	-					
2. IES-UPE	.49*	-				
3. IES-BFCC	.43*	-.12	-			
4. Enjoy taste	.19	.30**	.13	-		
5. Enjoy taste- before eating	.21*	.31**	.14	.96**	-	
6. Enjoyed taste- after eating	.12	.23**	.09	.95**	.84**	-

Note. IES = Intuitive Eating Scale 2, UPE = Unconditional permission to eat, BFCC = Body-food choice congruence, Enjoy taste- before eating = "I will enjoy the taste of this food", Enjoy taste- after eating = "I enjoyed the taste of this food".

* $p < .05$. ** $p < .01$.

Hypothesis 2d: Eating Restrictions and Regret

Another tenet of intuitive eating involves the ability to eat free from restrictions or regrets, and it was hypothesized that trait level intuitive eating would be related to fewer restrictions and less regret surrounding eating. This hypothesis was partially supported (see Table 11). IES-total was correlated with less eating restrictions across all EMA recordings. However, "unconditional permission to eat" (IES-UPE) was not associated with eating restrictions across any EMA recordings. Therefore, while intuitive eating generally may be linked to fewer restrictions and less regret regarding eating, this link is not found for those not following rigid rules for eating.

Table 11

Correlations for IES-total, IES-UPE, and Eating Restrictions

	1	2	3	4	5
1. IES-total	-				
2. IES-UPE	.49*	-			
3. Eating restrictions	-.45**	-.17	-		
4. Eating restrictions- before eating	-.44**	-.15	.95**	-	
5. Eating restrictions- after eating	-.40**	-.15	.95**	.82**	-

Note. IES = Intuitive Eating Scale 2, UPE = Unconditional permission to eat, Eating restriction-before eating = "I shouldn't eat this", Enjoy restrictions- after eating = "I shouldn't have eaten what I ate".

* $p < .05$. ** $p < .01$.

Aim 3: Testing Acceptance Model of Intuitive Eating

The acceptance model of intuitive eating posits that positive environmental factors are related to positive self-attitudes which foster intuitive eating. This model had not yet been examined at the momentary level to see if state levels of key constructs predicted intuitive eating in the moment. To test the acceptance model of intuitive eating at the momentary level, mixed linear modelling was conducted to determine if hypothesized constructs included in the acceptance model (measured at a random recording) predicted intuitive eating (measured at the next before eating recording).

First, a model was run to see if "body appreciation" (BAS2), "perceived social support" (SPS), "perceived body acceptance by others" (BAOS), and "resisting taking an outsider's perspective of one's body" (OBC) predicted "intuitive eating". Hypothesized relationships were

partially supported, in that “body appreciation” and “body acceptance by others” significantly predicted higher intuitive eating when controlling for other variables (see Table 12). Second, individual models were run one by one with each of the four hypothesized predictors of intuitive eating. Again, hypothesized relationships were partially supported, in that “body appreciation”, “body acceptance by others”, and “perceived social support” significantly predicted higher intuitive eating. Therefore, results suggest that feeling self-love for one’s body and feeling that others support you and accept your body relates to the enhanced ability to follow internal cues for hunger and satiety.

Table 12

Acceptance Model: Mixed Model Estimates of Random and Fixed Effects, Standard Errors (SE), and p-values

Full model, prediction of IES-total			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	3.37	0.18	< .001
BAS2	0.06	0.04	.03
SPS	0.05	0.04	.18
BAOS	.06	.03	.03
OBC	-0.01	0.02	.80
BAS, prediction of IES-total			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	3.45	0.09	< .001
BAS	0.09	0.02	< .001

SPS, prediction of IES-total			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	3.44	0.12	< .001
SPS	0.08	0.03	.01
BAOS, prediction of IES-total			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	3.45	0.09	< .001
BAOS	0.09	0.02	< .001
OBC, prediction of IES-total			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	3.74	0.09	< .001
OBC	0.004	0.02	.83

Note. IES = Intuitive Eating Scale 2, BAS2 = Body Appreciation Scale 2, SPS = Social Provisions Scale, BAOS = Body Acceptance by Others Scale, OBC = Objectified Body Consciousness Scale. A total of 1,069 data points were included in analyses (data point was included if a before-eating recording of intuitive eating was directly preceded by a random recording).

Aim 4: Expanded Acceptance Model of Intuitive Eating

Ecological Validity of Exercise Motives

To determine how trait level exercise motives (measured by FES at baseline) are related to state level exercise motives (measured by FES at the random recordings), a series of correlations were run. As predicted (hypotheses 4a & 4b), for both "appearance/weight exercise motives" and "health/enjoyment motives", trait levels were significantly correlated with state levels of these same variables (See Table 13). This finding provides support for the ecological validity of this measurement of exercise motives, in that global reporting of exercise motives maps onto reporting of actual motives in one's natural environment.

Table 13

Correlations for FES at State and Trait Levels

	1	2	3	4
1. FES-Health/enjoyment	-			
2. FES-Appearance/weight	.19*	-		
3. State FES- Health/enjoyment	.64**	.08	-	
4. State FES- Appearance/weight	-.08	.50**	-.09**	-

Note. FES = The Function of Exercise Scale.

* $p < .05$. ** $p < .01$.

Testing Expanded Acceptance Model of Intuitive Eating

To test the expanded acceptance model of intuitive eating at the momentary level, a series of mixed linear models were conducted to better understand how individual pathways in the expanded acceptance model function at the momentary level. To analyze each pathway, a

variable measured at an EMA recording was analyzed as a predictor of a dependent variable measured at the very next EMA recording.

Hypothesis 4c: Predicting Appearance/Weight Exercise Motives. A model was run to determine if "resisting taking an outsider's perspective of one's body" (OBC) predicted "appearance/weight exercise motives" (FES-appearance and weight subscale). As hypothesized, more resistance of taking an outsider's perspective of one's body significantly predicted exercising for fewer appearance/weight driven motives (see Table 14).

Hypothesis 4d: Predicting Body Appreciation. A model was run with "appearance/weight exercise motives" (FES-appearance and weight subscale) predicting "body appreciation" (BAS2). As hypothesized, higher appearance and weight motives for exercise significantly predicted lower body appreciation (see Table 14).

Hypothesis 4e: Predicting Intuitive Eating. A model was run with "body appreciation" (BAS2) and "appearance/weight exercise motives (FES-appearance and weight subscale) predicting intuitive eating (IES). Controlling for other predictors, only exercising for appearance/weight motives significantly predicted less intuitive eating, partially supporting the hypotheses (see table 14).

Table 14

Expanded Acceptance Model: Mixed Model Estimates of Random and Fixed Effects, Standard Errors (SE), and p-values

Hypothesis 4c predicting FES-appearance and weight subscale[a]			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	4.62	0.49	< .001
OBC	-0.38	0.12	.002
Hypothesis 4d predicting BAS2[b]			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	3.47	0.14	< .001
FES-appearance & weight subscale	-0.06	0.03	.03
Hypothesis 4c predicting IES[c]			
	Estimate	Standard Error	*p*
Fixed Effects			
Intercept	3.67	0.18	< .001
BAS2	.07	.05	.15
FES- appearance & weight subscale	-.04	0.02	.04

Note. IES = Intuitive Eating Scale 2, FES = The Function of Exercise Scale, OBC = Objectified Body Consciousness Scale, BAS2 = Body Appreciation Scale 2.

[a] A total of 227 data points were included in analyses (data point was included if a random recording of exercise motives was directly preceded by a random recording). [b] A total of 310 data points were included in analyses (data point was included if a random recording was directly preceded by a random recording of exercise motives). [c] A total of 578 data points were included in analyses (data point was included if a before eating recording was directly preceded by a random recording of exercise motives).

Aim 5: Weight Stigma and Internalized Weight Bias

A series of correlations and a multiple linear regression model were run to better understand how trait levels of weight stigma (SSIB) and internalized weight bias (WBISM) relate to intuitive eating (IES) at the momentary level. As hypothesized, SSIB and WBISM scores were both associated with lower levels of intuitive eating at the momentary level (see table 15). Next, a multiple linear regression was conducted to predict intuitive eating based on weight stigma and internalized weight bias. Results were significant, indicating that 15% of the variance in intuitive eating was explained by weight stigma and internalized weight bias ($F(2, 100) = 8.48$, $p < .001$, $r^2 = .15$). Internalized weight bias significantly predicted less intuitive eating when controlling for weight stigma, ($t = -3.19$, $p = .002$), although the inverse was not true for weight stigma ($t = -1.25$, $p = .22$). These results suggest that holding negative stereotyped views about one's weight may play an important part in how likely someone is to eat based on internal cues instead of diet rules.

Table 15

Correlations for SSIB, WBISM, and IES-state

	1	2	3
1. SSIB	-		
2. WBISM	.36**	-	
3. IES-state	-.24*	-.37**	-

Note. SSIB = Stigmatizing Situations Inventory-Brief, WBISM = Weight Bias Internalization Scale- Modified, IES = Intuitive Eating Scale 2.

* $p < .05$. ** $p < .01$.

EMA Experience and Measurement Reactivity

Participant responses to questions about their experience with EMA and measurement reactivity can be found in Table 16. Of note, participants reported a mostly positive experience with the EMA procedures with 77% of participants rating the experience a 6 or higher on a 10-point scale (10 = the most positive experience). Participants also reported finding the monitoring to be more "disruptive" ($M = 4.16$, $SD = 1.75$) than "time consuming" ($M = 3.23$, $SD = 1.64$; $t(103) = -6.20$, $p < .001$). At the same time, they reported monitoring to be more "easy" ($M = 4.84$, $SD = 1.58$) than "disruptive" ($t(103) = 2.40$, $p = 0.02$).

Participants mostly reported not changing their eating due to the study, with 61% of the sample endorsing a rating of 3 or lower on a 7-point scale (with lower scores indicating minimal to no eating changes). Participants also reported that their eating over the week of the study was mostly typical of their eating patterns, with 84% of the sample endorsing a rating of 5 or higher on a 7-point scale (with higher scores indicating more typical eating patterns). Participants

reported that they thought their responses were mostly private (M = 4.84 on a 7-point scale with higher scores indicating thinking their responses were more private).

Table 16

EMA Experience and Measurement Reactivity

	Range	*M (SD)*
1. How easy was monitoring?	1 (*not at all easy*) to 7 (*extremely easy)*	4.84 (1.58)
2. How disruptive was monitoring?	1 (*not at all*) to 7 (*extremely disruptive)*	4.16 (1.75)
3. How time consuming was monitoring?	1 (*not at all*) to 7 (*extremely)*	3.23 (1.64)
4. How was the overall experience of monitoring?	1 (*very negative*) to 10 (*very positive)*	7.04 (2.07)
5. Do you think you've changed your eating this past week because of the study?	1 (*strongly disagree*) to 7 (*strongly agree)*	3.07 (1.90)
6. Was this past week typical of your eating patterns?	1 (*strongly disagree*) to 7 (*strongly agree)*	5.77 (1.26)
7. Did you think your responses were private?	1 (*strongly disagree*) to 7 (*strongly agree)*	4.84 (1.82)

Rating Intuitive Eating as an Eating Style

Participants were presented with a description of intuitive eating and asked to respond to a number of Likert scales regarding their attitudes toward intuitive eating (see table 17). Of note, 32% of the sample indicated that they "strongly agree" that they eat this way currently, and responses on this question were positively correlated to IES baseline scores (r = .38, p < .01) and IES EMA scores (r = .36, p < .01). Additionally, 34% of the sample reported that they "strongly agreed" with intuitive eating being appealing to them, but participants rated intuitive eating as significantly more "appealing" compared to their feelings of "liking" to follow this eating approach, t(101) = -2.56, p = 0.01. A total of 24% of the sample reported that they "strongly agreed" with feeling as if they "could" follow this style of eating.

Participants were additionally asked a number of open-ended questions about intuitive eating (note that in depth analyses of qualitative findings is beyond the scope of the current study, but will be addressed in a separate research project). When asked what things made them feel able to eat intuitively, they gave responses such as “I am very tuned into my body and the signals I receive from it”, “I have a very busy schedule, so I typically only take a break to eat when I'm physically hungry”, and “I keep good food in the house, and I cook a lot”. When asked what things made them feel unable to eat intuitively, they gave responses such as “The urge to snack when bored”, “being around friends who partake in unhealthy eating habits”, “I don't trust my hunger signals”, and “Money and time…not having enough of either”. Finally, participants were asked if they would consider following intuitive eating long term, to which they responded “Yes…I would like some additional support to keep me going in the long-term”, “If I could trust my body to tell me when to eat, I would follow this pattern”, “Maybe, if I wasn't concerned with my weight and being in shape”, and “I definitely would and I plan to follow this pattern in the future when I become more independent”.

Table 17

Ratings for Intuitive Eating as an Eating Style

	M (SD)
I could follow this style of eating	3.72 (1.12)
This style of eating appeals to me	3.85 (1.14)
I would like to follow this style of eating	3.66 (1.13)
I eat this way currently	3.77 (1.19)

Note. All items rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). For description of intuitive eating provided to participants, see measures section.

Chapter 4 Discussion

While other studies have examined how intuitive eating is related to a variety of psychological constructs, the current study appears to be the first to look at the ecological validity of intuitive eating at a momentary level. Specific aims in this study were to

1. Examine the ecological validity of intuitive eating,
2. Test for relationships between intuitive eating and key tenants (i.e., less emotional eating, less guilt following eating, more enjoyment of tastes of food, and fewer eating restrictions),
3. Test the acceptance model of intuitive eating at the momentary level,
4. Test an expanded acceptance model of intuitive eating which incorporates exercise motives at a momentary level, and
5. Examine how experiences of weight stigma and internalized weight bias are related to intuitive eating.

Participants

While the current study was open to men and women of all weight statuses, the final sample was predominantly female (87.5%), and the mean BMI was in the overweight range (M = 26.28). The sample was 46.2% Hispanic, and this is in line with demographics of enrolled students at the University of New Mexico (UNM Office of Institutional Analytics; 2020). Considering that most of the intuitive eating research has been conducted with predominantly non-Hispanic white females, the gender and ethnic diversity of the current sample are strengths, although findings may not translate to all populations.

EMA Compliance

Participants responded to an average of 68% of random recordings sent to them, or almost 3.5 of 5 daily random recordings (M = 3.43). When participants with less than 50%

compliance are excluded (n = 20) compliance was 77%. This is in line with similar studies reporting compliance rates ranging from 69-92%, although studies often do not report compliance rates (Haedt-Matt & Keel, 2011a; Ranzenhofer et al., 2014; Reichenberger et al., 2020). Of note, the current study was completely online (i.e., involved no in-person contact or trainings with researchers), required recordings to be completed within one hour from when they were received, and did not send participants reminder messages. Other studies reporting particularly high compliance rates often incorporated in-person trainings with researchers and/or reminder messages (Lavender et al., 2013; Smith et al., 2019).

Participants completed a daily average of 1.88 of the before eating recordings and 1.67 after eating recordings. Studies with similar designs also reported daily averages ranging from 1.17 to 1.92 for eating event contingent reporting (Grenard et al., 2013; Ranzenhofer et al., 2014). All participants who were enrolled in the EMA portion of the study completed the post-study assessment (while many studies do not report how many participants were lost to follow-up, the findings in this study are in line with other reportings, Mundi et al., 2015).

To better understand compliance in the current study, analyses were conducted to determine if compliance rates were related to other measured variables. Results indicated that compliance was not related to any demographic factors or key variables (i.e., BMI, age, ethnicity, gender, or intuitive eating). This type of analysis is seldom reported in EMA studies, but it allows for increased certainty that data gathered during the EMA portion of the study is not systematically biased.

Aim 1: Ecological Validity of Intuitive Eating

As hypothesized, all IES total and subscale scores at baseline were significantly correlated with state levels of intuitive eating, supporting the ecological validity of the IES-2.

This important finding suggests that global intuitive eating levels reported by individuals truly map onto their attitudes surrounding eating and eating choices in their natural daily environments. Future work should seek to further validate this scale adapted for EMA to best capture intuitive eating in the moment so that further momentary relationships can be explored.

Of note, the relationship between trait level intuitive eating (measured at baseline) and state level intuitive eating was stronger before eating compared to after eating for the IES-total and IES subscales measuring "reliance on hunger and satiety cues" (IES-RHS) and "body-food choice congruence" (IES-BFCC). This finding suggests that while global intuitive eating attitudes are related to attitudes both before and after eating, this connection is stronger before eating. Furthermore, it may be that intuitive eaters respect the body's needs and trust hunger and satiety cues more to guide eating *intentions* prior to eating. While intuitive eaters do report having respected the body's needs and having trusted hunger and satiety cues after eating, this connection is not as strong. It is unclear why this connection is not as strong, but it could be influenced by types of food, tastes of food, and context (i.e., being with others vs. alone or being at home vs. being at a restaurant). While this finding needs to be further explored and validated in future research, it may help to guide strategies to enhance intuitive eating in intervention programs such that intuitive eaters are better able to eat in line with intuitive eating principles (Clifford et al., 2015; Mensinger et al., 2016; Schaefer & Magnuson, 2014).

Aim 2: Intuitive Eating's Relationship to Key Constructs

Affect

Intuitive eating is described as an alternative to detrimental eating patterns such as emotional eating, in which eating choices are made impulsively based on intense, and usually negative, emotions (Branden et al., 2018). In fact, intuitive eating involves the explicit focus on

eating in response to physical hunger as opposed to being guided solely by strong emotions. Therefore, it was predicted that intuitive eating would be associated with less negative affect prior to eating.

Study results were partially in support of these hypotheses in that the IES-total but not "eating for physical rather than emotional reasons" (IES-EPR) was associated with higher valence moods before eating. This supports the idea that intuitive eaters may generally have higher positive affect prior to eating, but that the tendency to eat when physically hungry instead of in response to strong emotions is not associated with affect (positive or negative) prior to eating. In contrast, studies of emotional eating have found that negative affect is highest before eating episodes, suggesting that intuitive eaters are relating to their emotions and decisions to eat in a distinctly different way compared to emotional eaters (Mason et al., 2019). Furthermore, while emotional eating is broadly tied to negative physical and psychological outcomes, eating in response to positive emotions independently has not been shown to have these negative relationships (Braden et al., 2018). Therefore, the current study findings appear to be in line with the idea of intuitive eating as an adaptive approach to eating that is not driven by strong emotions but guided by physical hunger cues.

Guilt After Eating

Consistent with hypotheses, the IES-total and "unconditional permission to eat" (IES-UPE) were associated with less guilt after eating. This finding is consistent with the idea proposed by Tribole and Resch (2012) that intuitive eaters "make peace with food" and "challenge the food police" in that they resist labeling foods as good/bad and allow themselves to eat a wide variety of foods without feeling guilty. In fact, in an experimental study, dieters were more likely to experience negative mood after eating and more likely to attribute negative mood

to eating decisions compared to nondieters (Polivy et al., 1999). Therefore, the findings provide support for the idea that eating intuitively and taking an "antidieting" stance is related to less guilt after eating.

Taste Enjoyment

By rejecting diet culture, proponents of intuitive eating claim that this eating approach allows followers to be more satisfied by eating and to enjoy food more (Tribole & Resch, 2012). In their *Intuitive Eating* text, Tribole and Resch (2012) state on their cover "make peace with food…rediscover the pleasures of eating". Partially in line with this, the IES-total was associated with higher (anticipated) taste enjoyment scores before eating, but not with taste enjoyment after eating. Interestingly, "unconditional permission to eat" (IES-UPE) was associated with more taste enjoyment across these two timepoints, while the "body-food choice congruence" (IES-BFCC) was not related to taste enjoyment.

Taste enjoyment has received more research attention in recent years, and a 2020 review found that eating pleasure was mostly positively associated with favorable dietary behavior outcomes such as healthy food choices, portion sizes, and diet quality (Bédard et al., 2020). Additionally, interventions incorporating eating pleasure principles have shown initial promising results in improved diet quality and increased perception of tastiness and the liking of healthy foods (Bédard et al., 2020). Therefore, the connection between the intuitive eating component of unconditional permission to eat desired foods without restriction, and more taste enjoyment before and after eating, could be an important connection tied to further favorable dietary outcomes.

It is unclear why IES-total scores were only associated with taste enjoyment scores before eating and not after eating. It may be that intuitive eating is more clearly related to

increased anticipation of taste enjoyment pre-eating, and the actual experience of enjoyment of food consumption is more variable and not strongly connected to trait levels of intuitive eating. Regarding "body-food choice congruence" (IES-BFCC), some work has shown that it is more connected to dieting or eating restraint compared to all other IES subscales (Tylka et al., 2020). Therefore, the connection between making eating choices in line with the body's needs and eating restraint may explain the disconnect between "body-food choice congruence" (IES-BFCC) and taste enjoyment scores.

Eating Restrictions and Regret

As hypothesized, IES-total scores were associated with fewer eating restrictions before eating and less regret after eating (i.e., "I shouldn't eat this", "I shouldn't have eaten what I ate"). This suggests that global tendencies towards intuitive eating are related to fewer eating restrictions and less regret in the moment. Contrary to hypotheses, the "unconditional permission to eat" (IES-UPE) subscale had a non-significant negative association to eating restrictions and eating regret. This is in line with studies showing that "unconditional permission to eat" (IES-UPE) can be associated with less healthy food choices or food choices that do not always match the body's needs (Tylka et al., 2013). In fact, proponents of intuitive eating argue for a balance between being able to generally eat in line with the body's needs while also being flexible in eating desired foods without judgement. The current study's findings suggest that while those scoring higher on "unconditional permission to eat" (IES-UPE) do not report *more* judgmental thoughts about eating/food choices, they also do not report significantly fewer of these types of thoughts about eating choices.

Aim 3: Acceptance Model of Intuitive Eating

The acceptance model of intuitive eating posits that positive environmental influences (i.e., unconditional acceptance from others and body acceptance by others) lead to positive self-attitudes (i.e., resisting taking an outsider's perspective of one's body and body appreciation) which foster intuitive eating (Avalos & Tylka, 2006). The current study tested whether these four variables from the acceptance model (measured in the moment at an EMA recording) predicted how intuitively someone ate (measured at the next before eating recording). When these four predictors were examined together in one model, body acceptance by others (BAOS) and body appreciation (BAS2) were both unique predictors of intuitive eating (IES). Next, when predictors were examined one by one in separate models, body acceptance by others (BAOS), body appreciation (BAS2), and unconditional acceptance from others (SPS) were significant predictors of intuitive eating (IES).

These findings mostly provide support for the acceptance model in that body appreciation had a direct connection to intuitive eating. This is in line with literature showing that viewing one's body favorably and treating it well are related to following internal cues for hunger and satiety (Avalos & Tylka, 2006; Bruce & Ricciardelli, 2016). The current study also found that body acceptance by others had a direct connection to intuitive eating. A recent meta-analysis (Linardon et al., 2021) reported that although not included in the original acceptance model, adding a direct path from body acceptance by others to intuitive eating improved model fit. Therefore, it may be that body acceptance by others both enhances body appreciation and is also related directly in enhanced intuitive eating. Findings for unconditional acceptance from others and resisting taking an outsider's perspective of one's body are more mixed, and suggest that instead of a direct link to intuitive eating, they may instead be indirectly related to intuitive eating through environmental influences and self-attitudes.

Aim 4: Expanded Acceptance Model of Intuitive Eating

The expanded acceptance model incorporates exercise motives (i.e., appearance/weight motives and enjoyment/function motives) into a model predicting intuitive eating. The current study examined this model by testing how appearance/weight motives for exercise (FES-appearance and weight subscale) are related to other constructs from the expanded acceptance model. For each analysis, a model was run to determine if a predictor (measured in the moment at an EMA recording) significantly predicted a dependent variable (measured in the moment at the next EMA recording). Findings from the current study provided some support for the expanded acceptance model. Specifically, resisting taking an outsider's perspective of one's body did significantly predict less appearance/weight exercise motives. Lower appearance/weight exercise motives were related to more body appreciation. Finally, lower appearance/weight exercise motives were uniquely predictive of intuitive eating, whereas body appreciation was not.

In general, these findings are in line with other research indicating that higher levels of appearance/weight exercise motives are related to more body dissatisfaction and disordered eating (LePage & Crowther, 2010; Prichard & Tiggemann, 2008; Tylka & Homan, 2015). Interestingly, the current study found that body appreciation did not uniquely predict intuitive eating when accounting for the effect of appearance/weight exercise motives. Other research has suggested that body appreciation predicts intuitive eating in women but not men (Tylka & Homan, 2015), therefore the findings in the current study might be explained by the inclusion of men in the sample. Future work should continue to explore the expanded acceptance model to better understand how exercise motives may be related to intuitive eating in distinct ways in women and men.

Aim 5: Weight Stigma and Internalized Weight Bias

Experiences of weight stigma (e.g., being stared at in public, or having loved ones feel embarrassed/ashamed of you) and internalized weight bias (i.e., applying negative weight stereotypes to oneself) have been repeatedly associated with generally negative physical and mental health outcomes (Craven & Fekete, 2019; Lee, Gonzalez, Small, & Thompson, 2019; Tylka et al., 2014). In line with existing research, the current study found that both weight stigma and internalized weight bias were significantly related to less intuitive eating, although only internalized weight bias was a unique predictor of intuitive eating. Exposure to negative portrayals of obesity have been shown experimentally to increase implicit weight bias (Hinman et al., 2015), and future research should explore whether internalized weight bias serves as a mediator in the relationship between weight stigma and intuitive eating.

Strengths and Limitations

The current study has a number of strengths, including a mixed gender and ethnically diverse sample. Additionally, the sample size is larger than in most EMA studies. The EMA study design is a strength in that it allows for relationships among momentary state level variables to be examined in the context of someone's natural environment.

Additionally, study findings should be considered in light of study limitations. The current study design cannot make claims of causality, as no variables were manipulated, and therefore it is possible that observed relationships are best explained by relationships to third variables. Additionally, 50% of the sample was in the overweight range, and this may have impacted the types of relationships and findings revealed with present analyses. Additionally, it cannot be known exactly how compliant participants were for the before and after eating recordings, or if outside factors systematically influenced the completion or noncompletion of

recordings. Regarding measurement issues, some EMA level variables were measured with a single item and most have not been validated for use in this context, therefore measurement error could have biased findings.

Final Conclusions

The present study found support for the ecological validity of intuitive eating. Analyses found that trait level intuitive eating reported at baseline was significantly correlated with state level intuitive eating reported across EMA recordings, with some evidence suggesting that correlations were stronger before eating compared to after eating. Intuitive eating generally was related to key tenets like more taste enjoyment, less guilt, fewer eating restrictions and less regret, and less negative affect before eating. Partial support was found for the acceptance and expanded acceptance models of intuitive eating. Finally, internalized weight bias significantly predicted lower intuitive eating scores reported across EMA recordings. This appears to be the first study to examine intuitive eating at the momentary level using EMA, and future work should continue to validate EMA appropriate measures to understand how intuitive eating functions and to improve intervention efforts.

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Appendix A. IES-2

Intuitive Eating Scale–2 (IES-2; Final Version)

Note that permission to use this measure is not required. However, we do request that you notify us via e-mail (tylka.2@osu.edu) if you use the Intuitive Eating Scale–2 in your research. Please seek permission if any item is modified.

For each item, the following response scale should be used: 1 = *strongly disagree,* 2 = *disagree,* 3 = *neutral,* 4 = *agree,* 5 = *strongly agree.*

Directions for Participants

For each item, please circle the answer that best characterizes your attitudes or behaviors. [Note to experimenter: use "check" in lieu of "circle" if survey is online.]

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.

Scoring Procedure

1. Reverse score Items 1, 2, 4, 5, 9, 10, and 11.
2. Total IES-2 scale score: Add together all items and divide by 23 to create an average score.
3. Unconditional Permission to Eat subscale: Add together Items 1, 3, 4, 9, 16, and 17; divide by 6 to create an average score.
4. Eating for Physical Rather Than Emotional Reasons subscale: Add together Items 2, 5, 10, 11, 12, 13, 14, and 15; divide by 8 to create an average score.
5. Reliance on Hunger and Satiety Cues subscale: Add together Items 6, 7, 8, 21, 22, and 23; divide by 6 to create an average score.
6. Body–Food Choice Congruence subscale: Add together Items 18, 19, and 20; divide by 3 to create an average score.

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Appendix B. DEBQ

R	1. If you have put on weight, do you eat less than you usually do?*
	2. Do you try to eat less at mealtimes than you would like to eat?
	3. How often do you refuse food or drink offered because you are concerned about your weight?
	4. Do you watch exactly what you eat?
	5. Do you deliberately eat foods that are slimming?
	6. When you have eaten too much, do you eat less than usual the following days?*
	7. Do you deliberately eat less in order not to become heavier?
	8. How often do you try not to eat between meals because you are watching your weight?
	9. How often in the evening do you try not to eat because you are watching your weight?
	10. Do you take into account your weight with what you eat?
E	11. Do you have the desire to eat when you are irritated?*
	12. Do you have a desire to eat when you have nothing to do?*
	13. Do you have a desire to eat when you are depressed or discouraged?*
	14. Do you have a desire to eat when you are feeling lonely?*
	15. Do you have a desire to eat when somebody lets you down?*
	16. Do you have a desire to eat when you are cross?*
	17. Do you have a desire to eat when you are approaching something unpleasant to happen?
	18. Do you get the desire to eat when you are anxious, worried or tense?
	19. Do you have a desire to eat when things are going against you or when things have gone wrong?
	20. Do you have a desire to eat when you are frightened?*
	21. Do you have a desire to eat when you are disappointed?*
	22. Do you have a desire to eat when you are emotionally upset?*
	23. Do you have a desire to eat when you are bored or restless?*
Ext.	24. If food tastes good to you, do you eat more than usual?
	25. If food smells and looks good, do you eat more than usual?
	26. If you see or smell something delicious, do you have a desire to eat it?

Dutch Eating Behaviour Questionnaire

Table 2. *(cont.)*

	Eig PC Cr
	27. If you have something delicious to eat, do you eat it straight away?
	28. If you walk past the baker do you have the desire to buy something delicious?
	29. If you walk past a snackbar or a cafe, do you have the desire to buy something delicious?
	30. If you see others eating, do you also have the desire to eat?
	31. Can you resist eating delicious foods?***
	32. Do you eat more than usual, when you see others eating?
	33. When preparing a meal are you inclined to eat something?

R = *Restrained Eating*
E = *Emotional Eating*
Ext = *External Eating*

Appendix C. SPS

Social Provisions Scale

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Instructions: In answering the following questions, think about your current relationships with friends, family members, co-workers, community members, and so on. Please indicate to what extent each statement describes your current relationships with other people. Use the following scale to indicate your opinion.

STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
1	2	3	4

So, for example, if you feel a statement is very true of your current relationships, you would respond with a 4 (strongly agree). If you feel a statement clearly does not describe your relationships, you would respond with a 1 (strongly disagree).

		Rating
1.	There are people I can depend on to help me if I really need it.	_____
2.	I feel that I do not have close personal relationships with other people.	_____
3.	There is no one I can turn to for guidance in times of stress.	_____
4.	There are people who depend on me for help.	_____
5.	There are people who enjoy the same social activities I do.	_____
6.	Other people do not view me as competent.	_____
7.	I feel personally responsible for the well-being of another person.	_____
8.	I feel part of a group of people who share my attitudes and beliefs.	_____
9.	I do not think other people respect my skills and abilities.	_____
10.	If something went wrong, no one would come to my assistance.	_____
11.	I have close relationships that provide me with a sense of emotional security and well-being.	_____
12.	There is someone I could talk to about important decisions in my life.	_____
13.	I have relationships where my competence and skill are recognized.	_____
14.	There is no one who shares my interests and concerns.	_____

		Rating
15.	There is no one who really relies on me for their well-being.	_____
16.	There is a trustworthy person I could turn to for advice if I were having problems.	_____
17.	I feel a strong emotional bond with at least one other person.	_____
18.	There is no one I can depend on for aid if I really need it.	_____
19.	There is no one I feel comfortable talking about problems with.	_____
20.	There are people who admire my talents and abilities.	_____
21.	I lack a feeling of intimacy with another person.	_____
22.	There is no one who likes to do the things I do.	_____
23.	There are people who I can count on in an emergency.	_____
24.	No one needs me to care for them.	_____

Scoring:

A score for each social provision is derived such that a high score indicates that the individual is receiving that provision. Items that are asterisked should be reversed before scoring (i.e., 4=1, 3=2, 2=3, 1=4).

1. Guidance: 3*, 12, 16, 19*
2. Reassurance of Worth: 6*, 9*, 13, 20
3. Social Integration: 5, 8, 14*, 22*
4. Attachment: 2*, 11, 17, 21 *
5. Nurturance: 4, 7, 15*, 24*
6. Reliable Alliance: 1, 10*, 18*, 23

Appendix D. BAOS

For each item, please **circle** the response that best captures your own experience.

1. **I've felt acceptance from my friends regarding my body shape and/or weight.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

2. **My friends have sent me the message that my body shape and weight are fine.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

3. **I've felt acceptance from my family regarding my body shape and/or weight.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

4. **My family has sent me the message that my body shape and/or weight are fine.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

5. **I've felt acceptance from people I've dated regarding my body shape and/or weight.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

6. **People I've dated have sent me the message that my body shape and weight are fine.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

7. **I've felt acceptance from the media (e.g., TV, magazines) regarding my body shape and/or weight.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

8. **I feel that the media has sent me the message that my body shape and weight are fine.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

9. **I've felt acceptance from society (e.g., school, church) regarding my body shape and/or weight.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

10. **I feel that society has sent me the message that my body shape and weight are fine.**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

Appendix E. OBC

Table 1

Objectified Body Consciousness Scales and Factor Loadings: Study 1

Item	*Factor 1 Body Shame*	*Factor 2 Control Beliefs*	*Factor 3 Surveillance*
Surveillance Scale			
1. I rarely think about how I look.*	.28	.10	−.59
2. I think it is more important that my clothes are comfortable than whether they look good on me.*	−.15	.03	−.84
3. I think more about how my body feels than how my body looks.*	.06	−.10	−.82
4. I rarely compare how I look with how other people look.*	.04	.09	−.73
5. During the day, I think about how I look many times.	−.41	−.07	.47
6. I often worry about whether the clothes I am wearing make me look good.	−.23	.02	.58
7. I rarely worry about how I look to other people.*	.04	.11	−.71
8 I am more concerned with what my body can do than how it looks.*	.21	−.04	−.58

Appendix F. BAS-2

For each item, the following response scale should be used: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Always

***Directions for participants**:* Please indicate whether the question is true about you never, seldom, sometimes, often, or always.

1. I respect my body.
2. I feel good about my body.
3. I feel that my body has at least some good qualities.
4. I take a positive attitude towards my body.
5. I am attentive to my body's needs.
6. I feel love for my body.
7. I appreciate the different and unique characteristics of my body.
8. My behavior reveals my positive attitude toward my body; for example, I hold my head high and smile.
9. I am comfortable in my body.
10. I feel like I am beautiful even if I am different from media images of attractive people (e.g., models, actresses/actors).

***Scoring Procedure**:* Average participants' responses to Items 1-10.

Appendix G. FES

Table 2 Factor Loadings of the Function of Exercise Scale (FES)

	Sample 1		Sample 2		Sample 3	
	Factor loading		Factor loading		Factor loading	
	1	2	1	2	1	2
Weight and appearance						
I exercise to work off unwanted calories. (12)	.812	–.005	.788	–.004	.795	–.117
I exercise because I want to be thin. (20)	.811	–.186	.790	–.189	.840	–.188
Exercise helps me control my weight. (6)	.800	.109	.777	.110	.872	.111
It makes my clothes fit better. (7)	.795	.000	.766	–.065	.772	–.004
I'm worried I'll gain weight if I stop exercising. (1)	.791	.135	.764	.122	.775	.125
I feel like I need to exercise after I eat unhealthy foods. (9)	.769	.004	.734	.049	.751	–.007
I exercise because I want to look good. (4)	.755	.006	.717	.061	.760	–.002
I will look better in a bathing suit if I exercise. (11)	.722	–.005	.686	–.059	.637	–.007
I feel bad about myself if I don't exercise. (14)	.674	.219	.631	.188	.578	.242
Total subscale	.770	_	.739	_	.753	_
Health and enjoyment						
I like the challenge. (13)	–.001	.843	–.003	.835	–.002	.734
I really have fun when I am exercising. (15)	–.007	.801	–.005	.773	–.001	.769
I exercise to gain a competitive edge in sports. (17)	–.005	.696	–.033	.624	–.001	.657
I want to be strong and healthy. (16)	.008	.685	–.082	.658	–.109	.710
I exercise to improve my physical stamina. (2)	.008	.686	.078	.636	–.006	.662
I want to learn new skill. (5)	–.009	.657	.071	.579	–.001	.593
Exercise releases tension. (8)	.214	.653	.204	.593	.246	.588
Total subscale		.717		.671		.673

Note. Numbers in parentheses indicate the sequence of items on the 20–item scale. Factor 1 = Weight and Appearance; Factor 2 = Health and Enjoyment.

Appendix H. SSI-B

Appendix Stigmatizing Situations Inventory-Brief (SSI-B)

Below is a list of situations that people encounter because of their weight. Please indicate whether, and how often, each of these situations happens to you.

0 Never	1 Once in your life	2 Several times in your life	3 About once a year	4 Several times per year	5 About once a month	6 Several times per month	7 About once a week	8 Several times per week	9 Daily

Being singled out as a child by a teacher, school nurse, etc., because of your weight.	0 1 2 3 4 5 6 7 8 9
Being stared at in public.	0 1 2 3 4 5 6 7 8 9
Children loudly making comments about your weight to others.	0 1 2 3 4 5 6 7 8 9
Having a doctor recommend a diet, even if you did not come in to discuss weight loss.	0 1 2 3 4 5 6 7 8 9
Having a romantic partner exploit you, because she or he assumed you were 'desperate' and would put up with it.	0 1 2 3 4 5 6 7 8 9
Overhearing other people making rude remarks about you in public.	0 1 2 3 4 5 6 7 8 9
Not being hired because of your weight, shape or size.	0 1 2 3 4 5 6 7 8 9
Having family members feel embarrassed by you or ashamed of you.	0 1 2 3 4 5 6 7 8 9
Having people assume you overeat or binge eat because you are overweight.	0 1 2 3 4 5 6 7 8 9
Being glared at or harassed by bus passengers for taking up 'too much' room.	0 1 2 3 4 5 6 7 8 9

Appendix I. WBIS-M

1. Because of my weight, I feel that I am just as competent as anyone.[1,2]
2. I am less attractive than most other people because of my weight.
3. I feel anxious about my weight because of what people might think of me.[1]
4. I wish I could drastically change my weight.
5. Whenever I think a lot about my weight, I feel depressed.[1]
6. I hate myself for my weight.[1]
7. My weight is a major way that I judge my value as a person.
8. I don't feel that I deserve to have a really fulfilling social life, because of my weight.[1]
9. I am OK being the weight that I am.[2]
10. Because of my weight, I don't feel like my true self.[1]
11. Because of my weight, I don't understand how anyone attractive would want to date me.