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REVIEW

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Intuitive eating and its psychological correlates: A meta-analysis

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Abstract

Objective: Intuitive eating is an adaptive style of eating that has generated significant research attention. Theoretically, intuitive eating is a core construct that features prominently in the Acceptance Model of Intuitive Eating, a framework that explains how positive environmental influences can foster intuitive eating practices via body appreciation. Empirically, intuitive eating has been connected to a broad range of adaptive mental health indices. At present, a quantitative synthesis of intuitive eating and its correlates has yet to be conducted. This was the objective of the current meta-analysis.

Method: Ninety-seven studies (89% cross-sectional) were included. Random effects meta-analyses were conducted on 23 psychological correlates, divided into three clusters: eating behavior and body image disturbances, positive body image and other adaptive factors, and general psychopathology. Meta-analytic path analyses were also computed to test the validity of the Acceptance Model.

Results: Intuitive eating was inversely associated with multiple indices of eating pathology, body image disturbances, and psychopathology (*r*s = −.23 to −.58). Intuitive eating was positively associated with numerous positive psychological constructs, such as positive body image, self-esteem, and wellbeing (*r*s = .20 to .58). Men reported higher levels of intuitive eating than women (*d* = 0.39), with differences being largest in Caucasian samples. Meta-analytic path analyses strongly supported the hypothesized pathways specified in the Acceptance Model of Intuitive Eating.

Conclusions: There is a strong evidence base for intuitive eating's connection to numerous adaptive psychological constructs. Attention should now shift toward prospective and experimental designs so that the temporal nature of these relationships can be identified.

Resumen

Objetivo: La alimentación intuitiva es un estilo de alimentación adaptativo que ha generado una atención significativa en la investigación. Teóricamente, la alimentación intuitiva es una construcción central que ocupa un lugar destacado en el Modelo de Aceptación de la Alimentación Intuitiva, un marco que explica cómo las influencias ambientales positivas pueden fomentar las prácticas alimentarias intuitivas a través de la apreciación corporal. Empíricamente, la alimentación intuitiva se ha relacionado con una amplia gama de índices adaptativos de salud mental. En la actualidad, aún no

se ha realizado una síntesis cuantitativa de la alimentación intuitiva y sus correlatos. Este fue el objetivo del metanálisis actual.

Método: Se incluyeron noventa y siete estudios (89% de corte transversal). Se llevaron a cabo metanálisis de efectos aleatorios en 23 correlatos psicológicos, divididos en tres grupos: comportamiento alimentario y alteraciones de la imagen corporal, imagen corporal positiva y otros factores adaptativos, y psicopatología general. También se calcularon los análisis de ruta metaanalítica para probar la validez del Modelo de Aceptación.

Resultados: La alimentación intuitiva se asoció inversamente con múltiples índices de patología alimentaria, alteraciones de la imagen corporal y psicopatología (rs = −.23 a −.58). La alimentación intuitiva se asoció positivamente con numerosos constructos psicológicos positivos, como la imagen corporal positiva, la autoestima y el bienestar (rs = .20 a .58). Los hombres informaron niveles más altos de alimentación intuitiva que las mujeres (d = 0,39), y las diferencias fueron mayores en las muestras caucásicas. Los análisis de rutas metaanalíticas respaldaron firmemente las rutas hipotéticas especificadas en el Modelo de Aceptación de la Alimentación Intuitiva.

Conclusiones: Existe una sólida base de evidencia para la conexión de la alimentación intuitiva con numerosos constructos psicológicos adaptativos. Ahora la atención debe desplazarse hacia diseños prospectivos y experimentales para poder identificar la naturaleza temporal de estas relaciones.

KEYWORDS
body image, eating disorders, eating pathology, intuitive eating, meta-analysis, wellbeing

1 | INTRODUCTION

The bulk of eating behavior research has traditionally focused on describing, explaining, and predicting pathological eating patterns in the absence of considering adaptive eating patterns. More recently, scholars have argued for a greater focus on adaptive eating patterns, on the basis that adaptive eating patterns do not reflect the mere absence of pathological eating but are important in their own right for fostering health and wellbeing (Tylka, Calogero, & Danielsdottir, 2015; Van Dyke & Drinkwater, 2014). Intuitive eating has been touted as one adaptive eating style and has quickly received growing clinical, research, and public health attention.

Intuitive eating is defined as having a strong connection with physiological hunger and satiety cues and eating in response to these cues (Tylka, 2006). People who eat intuitively do not ruminate about food or dieting, classify foods into either "good" or "bad" categories, or ignore their hunger cues. Instead, they select foods that they enjoy while still enabling their body to function optimally, rely on their hunger signals to determine when and how much to eat, and respect their satiety signals by refraining from eating when they are comfortably full (Tribole & Resch, 1995).

Since the first intuitive eating scales emerged in the early 2000s (Hawks, Merrill, & Madanat, 2004; Tylka, 2006), a large number of studies have investigated intuitive eating's connection to various mental health and wellbeing indices. The vast majority of studies exploring correlates of intuitive eating have been cross-sectional, although recent preliminary evidence suggests that intuitive eating can also predict lower levels of eating disorder psychopathology and psychological distress over time (Hazzard et al., 2020). Among these cross-sectional studies, intuitive eating has been consistently associated with lower levels of disordered and restrictive eating, body image concerns, and psychological distress, and higher levels of self-esteem, positive body image facets, social support, and quality of life (e.g., Augustus-Horvath & Tylka, 2011; Homan & Tylka, 2018; Linardon et al., 2020; Linardon, Incerti, & McLean, 2019; Linardon & Mitchell, 2017; Schoenefeld & Webb, 2013; Tylka & Wilcox, 2006; Webb & Hardin, 2016). Crucially, these associations have largely replicated across many different age groups, weight categories, and gender, ethnic, and cultural identities (for a systematic review, see Bruce & Ricciardelli, 2016). There is also a small but growing body of evidence to suggest that intuitive eating might be relevant for individuals with clinically significant eating disorders. For instance, a recent pilot study showed that men who recovered from an eating disorder reported higher levels of intuitive eating than men who were partially recovered or who had a current eating disorder (Bardone-Cone et al., 2019). Further, another pilot study found that increases in intuitive eating during psychological treatment were associated with greater symptom improvement in patients with eating disorders

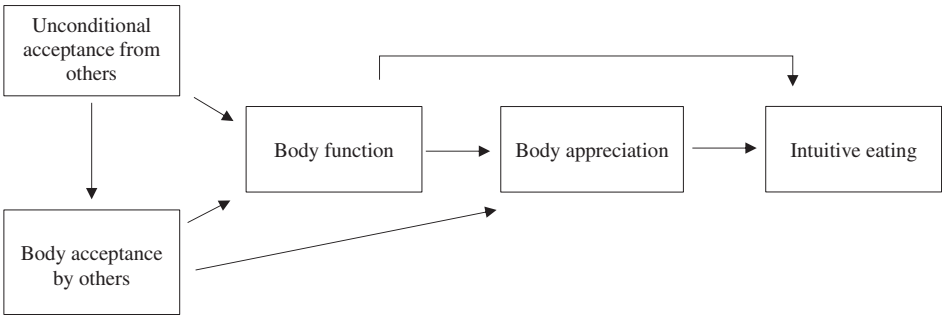

FIGURE 1 The hypothesized acceptance model of intuitive eating

(Richards, Crowton, Berrett, Smith, & Passmore, 2017). These findings suggest that intuitive eating shows potential as an intervention target among clinical populations.

Recognising that a large number of psychosocial factors have demonstrated connections to intuitive eating patterns, Avalos and Tylka (2006) were the first to integrate this literature and propose a cohesive theoretical model describing how key variables might work together to predict intuitive eating. Drawing from both humanistic (Rogers, 1961) and objectification (Fredrickson & Roberts, 1997) frameworks, their Acceptance Model of Intuitive Eating highlights how acceptance by others can foster intuitive eating patterns via the development of an internal orientation of, and appreciation toward, one's body. More specifically, this model posits that the path to intuitive eating begins with positive environmental influences, including an unconditional general and body acceptance by others. Those who receive unconditional acceptance are more likely to perceive that others are also accepting of their body. Accordingly, these individuals do not feel the need to turn to social ideals for guidance on how to appear, nor do they feel any external pressure to modify their body through eating restraint. These positive environmental experiences are instead thought to encourage individuals to focus on their inner experiences, or how their bodies function, feel, and perform. Individuals who focus on how their bodies function are hypothesized to show more appreciation toward their body. Those who appreciate their body are more attuned to their bodily needs, including internal hunger and satiety signals, and are therefore more likely to honor these signals rather than be governed by external factors (Avalos & Tylka, 2006). Figure 1 presents a schematic representation of this model.

A series of cross-sectional studies have used path analysis or structural equation modeling to directly test the predictions outlined in the Acceptance Model of Intuitive Eating. There is consistent statistical support for this model and its hypothesized paths (except the path from general unconditional acceptance to body function, which has received mixed support) among various population groups, including adolescent girls (Andrew, Tiggemann, & Clark, 2015), emerging adult, early adult, and middle adult women (Augustus-Horvath & Tylka, 2011), female college athletes (Oh, Wiseman, Hendrickson, Phillips, & Hayden, 2012), and college men (Tylka & Homan, 2015). However, there is evidence to suggest that the strength of certain paths is variable for different age groups and genders. For example, the path from body acceptance by others to body appreciation has been shown to be strongest for early and middle adult women rather than emerging adult women (Augustus-Horvath & Tylka, 2011), indicating that as women get older the extent to which they appreciate their bodies may depend on others' acceptance of their bodies. Likewise, the path from body appreciation to intuitive eating has been shown to be stronger in women than men (Tylka & Homan, 2015), suggesting that a positive attitude toward one's body may be a crucial factor accounting for variability in women, whereas for men other factors may be better predictors of intuitive eating. Despite these minor differences, existing research identifies the Acceptance Model as a promising framework for understanding, explaining, and predicting adaptive body image and eating patterns.

Despite accumulating empirical work examining the role of intuitive eating, including its connection to those variables implicated in the Acceptance Model and to broader adaptive and maladaptive constructs, a comprehensive quantitative synthesis of this literature has yet to be conducted. A meta-analytic review is necessary to more precisely characterize the nature, strength, and direction of these associations, and to clarify any inconsistencies observed within the literature. For example, significant negative relationships between intuitive eating and BMI have been reported in some studies (Tylka, Calogero, & Danielsdottir, 2015), but not others (Swami et al., 2020), while significant positive relationships between intuitive eating and self-esteem have also been reported in certain studies (Alleva, Tylka, & Kroon Van Diest, 2017), but not in others (Vintilă et al., 2020). Furthermore, a meta-analysis that identifies robust correlates of intuitive eating could also inform future prospective studies by narrowing down the list of *plausible* antecedents and consequences of intuitive eating that warrant additional investigation through these designs. Another key advantage of meta-analysis is that it may also help explain variability in effect sizes, which is necessary for better understanding for whom and under what conditions an association is strongest or weakest.

A main advantage of a meta-analysis is the ability to examine whether certain variables moderate the strength of associations across studies. There is reason to suspect that certain sample characteristics moderate intuitive eating's relationships to psychological constructs. *Gender* and *ethnicity* may be two relevant moderators. There is mounting pressure for women to achieve a thin ideal body frame, particularly in Western cultures where beauty, attractiveness, and physical appearance are highly valued, are key sources of self-esteem, and are important determinants of peer popularity (Fredrickson & Roberts, 1997; Grogan, 2016). Men's bodies tend to be less

scrutinized than women's bodies, and women may be much less likely to trust and honor their hunger and satiety cues but instead turn to regimented dietary practices to achieve this ideal body type.

Age may be another potential moderator. As we get older, our responsibilities broaden, our bodies begin to change due to natural processes, and our family and career roles become more established (Arnett, 2000). This may explain why older individuals are generally less concerned with their appearance and the need to alter it compared with younger people for whom body image is more salient (Tiggemann & McCourt, 2013). Furthermore, older individuals tend to experience a shift in focus to health and functionality (Tiggemann, 2015), indicating that they may be more likely pay attention to and take care of their body's needs.

Body mass may also be a relevant moderator. As a lower body weight tends to be reinforced, promoted, and equated with health in many societies (Thompson & Stice, 2001), individuals with a lower body mass may feel like they can trust their body's natural ability to regulate eating and eat according to hunger and satiety cues (Resch & Tylka, 2019). By contrast, a higher body weight is usually stigmatized and viewed as unhealthy, so individuals with a higher body mass may learn to distrust their self-regulatory hunger and satiety cues and instead eat according to external rules (Augustus-Horvath & Tylka, 2011).

Another advantage of meta-analysis is that it is possible to estimate complex path models by pooling multiple independent studies that have tested one or more of the relationships specified in a theoretical model. The increased sample size and resultant statistical power and precision that comes with this meta-analytic path approach is advantageous in the sense that it would allow us to (a) more precisely test the validity of the Acceptance Model and (b) better clarify the strength, direction, and significance of certain paths that have thus far received mixed support. Applying meta-analytic path analyses would thus be useful to more precisely test the validity of the Acceptance Model of Intuitive Eating and better estimate the magnitude of unique associations between its hypothesized pathways.

We conducted the first meta-analysis to quantitatively synthesize the existing research on intuitive eating, with the following aims: First, we aim to estimate the strength and direction of the association between intuitive eating and any psychological construct with which it has been paired. Second, we aim to explore whether participant gender and ethnic distribution, age, and body mass moderate these associations. Third, we aim to test whether any gender differences in intuitive eating levels exist. Although it has been hypothesized that women would report lower levels of intuitive eating than men (Tylka & Homan, 2015)—in part due to women's bodies being more scrutinized than men's resulting in a greater tendency to adopt a regimented diet — previous studies examining gender differences have yielded mixed results. Some of these studies possessed limited statistical power to detect significant gender differences due to small sample sizes. Aggregating these studies via meta-analytic procedures will overcome the limitations of sample size in individual studies, and will more conclusively address whether there are gender differences in intuitive eating. Fourth, we aim to test the magnitude of group differences in intuitive eating scores between individuals with and without an eating disorder. Fifth, we aim to test the validity of the Acceptance Model of Intuitive Eating using a meta-analytic path approach, in both mixed gender and gender-specific samples.

2 | METHOD

2.1 | Search strategy and study selection

The primary search strategy involved searching the title and abstract of papers from four online databases (Scopus, Medline, Web of Science, and ProQuest Database for Dissertations) in November 2020 using the two keywords "intuitive eat*" OR "eating intuitively." In the case of studies assessing intuitive eating but not reporting these two key terms in the title or abstract, a secondary search strategy was conducted that involved searching through all of the records that cited existing intuitive eating scales, including original Intuitive Eating Scale (Hawks et al., 2004), the 21-item Intuitive Eating Scale (IES; Tylka, 2006), and the 23-item IES-2 (Tylka & Kroon Van Diest, 2013).

Included studies were those that assessed intuitive eating, reported its relationship to any psychological construct or to participant gender, and provided the necessary data to calculate an effect size estimate. Both published and unpublished studies were eligible. No sample restrictions were applied. Any study design was permitted except case studies or case series (in which aggregated data were not reported). Only English-language studies were included. If more than one paper reported on the same sample, the paper with the largest sample was selected for inclusion, unless the papers reported different intuitive eating correlates that were not included in the same meta-analysis. If a study did not include data for effect size calculation, the authors were contacted, and the study was excluded if they failed to provide the data.

While we acknowledge that a few studies have investigated intuitive eating-based interventions, we made an a priori decision to not calculate effect sizes of intervention effects for the following two reasons. First, there are few existing studies available to conduct meta-analyses, and of those that exist, many are non-randomized designs which prevent any firm conclusions regarding the efficacy of these interventions. Second, the intervention type and dosage, sample characteristics, and quality ratings differ substantially from study to study, making it difficult to amalgamate effect sizes. Although preliminary evidence suggests that such interventions can effectively cultivate intuitive eating principles (Boucher et al., 2016; Bush, Rossy, Mintz, & Schopp, 2014; Cole et al., 2019), it is our view that this literature should first mature before any meta-analyses are conducted.

2.2 | Data extraction

A coding template was developed to extract the relevant data from studies included in the meta-analysis. The following information was extracted from each study: study name, mean age, mean body mass

index, gender, racial, and ethnic distribution, quality criteria, sample size, correlation statistics, and psychological correlates explored. The first author extracted this information, and an independent research assistant extracted this information from 30% of included studies to check for accuracy. Excellent agreement was observed between the two coders (kappas > .86).

2.3 | Quality of studies

A modified version of the Newcastle–Ottowa Scale developed by Modesti et al. (2016) was used to assess the quality of included studies. Quality domains assessed were (a) sample size (one point for sample size justification and zero points for no justification), (b) response rate (one point for when comparability between survey respondents and non-respondents are established, zero points when non-respondents or their characteristics are not described), (c) ascertainment of exposure (two points for a validated measure, one point for non-validated measure but was described, or zero points for no description), (d) ascertainment of outcome (two points for interview-based measure, one point for self-report measure, or zero points for no description), and (e) appropriate statistical analyses (one point if the statistical analyses were appropriate, and confidence intervals and associated *p*-values are reported, or zero points if the statistical analyses are not appropriate, described, or incomplete). A quality score was assigned to each study. The maximum score that could be obtained was seven.

2.4 | Meta-analysis

All meta-analyses conducted were based on cross-sectional relationships due to limited number of prospective studies investigating the same relationship between intuitive eating and a particular psychological construct over time. For meta-analyses on continuous psychological correlates, Pearson correlation coefficient (*r*) was selected as the measure of effect size, with values of .10 considered weak, .30 considered moderate, and .50 considered strong (Cohen, 1992). A decision was made to only conduct a meta-analysis on the association between intuitive eating and a particular construct if four or more studies assessed that construct. If a study used more than one measure or subscale to assess a construct, then the mean of the effect sizes from each measure or subscale within the study was calculated before the effect sizes were pooled (Borenstein, Hedges, Higgins, & Rothstein, 2009). Correlation coefficients were transformed prior to analyses using Fisher's Z_r transformation so that each effect size could be weighted by its inverse variance (Lipsey & Wilson, 2001). For ease of interpretation, these effect sizes were converted back into standard correlation coefficients for reporting.

For the comparison of men versus women (or individuals with vs. without eating disorders) on intuitive eating scores, the standardized mean difference was selected as the measure of effect size, which was calculated by dividing the difference between the two group means by the pooled standard deviation. Values of 0.20, 0.50, and 0.80 are considered weak, moderate, and strong effect sizes, respectively (Cohen, 1992).

Meta-analyses were conducted on total intuitive eating scores rather than on specific subscales. This decision was made because (a) only a minority of studies reported relationships for the specific subscales, (b) of those that did, different measures of intuitive eating were administered, each of which contain distinct subscale structures, and (c) subscale structures for existing intuitive eating measures have not always replicated in certain population groups (Swami et al., 2020; Vintilă et al., 2020).

Meta-analyses were performed using Comprehensive Meta-Analysis (Borenstein et al., 2009). Since considerable heterogeneity was expected, random effects models were used for all analyses. Heterogeneity was examined by calculating the I^2 statistic, which quantifies heterogeneity revealed by the $Q_{statistic}$ and reports how much overall variance (0–100%) is attributed to between-study variance (Higgins & Thompson, 2002). Univariate meta-regressions were also performed to examine whether there was a relationship between continuous study characteristics and effect sizes, as indicated by a regression slope and associated *p*-value. A decision was made to only conduct a meta-regression when at least 10 effect sizes were available per covariate, per prior recommendations (Borenstein et al., 2009). The threshold for statistical significance was set at .001 to account for the large number of meta-regressions performed.

2.4.1 | Meta-analytic path model

We also conducted a meta-analytic path model to test the acceptance model using effect sizes calculated from studies that reported one or more of the relationships specified in this model. Bivariate correlations generated from meta-analyses covered in the subsection above were converted into a correlation matrix that was used as an input file in Mplus version 8.3 (Muthén & Muthén, 2010). As the number of studies and overall sample size varied across these bivariate correlations, the harmonic mean of these varying sample sizes was used as sample size for our path analytic meta-analysis, as per prior studies (e.g., Hagger, Chan, Protogerou, & Chatzisarantis, 2016). Although this approach of using a harmonic mean can reduce power for pathways that had a larger sample size than the harmonic mean, all pathways were sufficiently powered in the present study to achieve statistical significance ($p < .05$).

This path model was run first for all samples, and then repeated with separate models for women and men. Adequacy of the model was evaluated in terms of model fit criteria, variance explained in endogenous variables, and whether the theoretically proposed pathways were significantly different from zero. Standard fit statistics and criteria were applied to evaluate model fit: the comparative fit index and Tucker–Lewis index (CFI and TLI, respectively; <.90 indicates poor fit; ≥.90 indicates acceptable fit; >.95 indicates good fit), the root mean square error of approximation (RMSEA; poor fit >.10; acceptable fit >.05 and ≤.10; and good fit ≤.05), and standardized root mean

square residual (SRMR; <.08 for good fit (Hu & Bentler, 1999; Marsh, Hau, & Grayson, 2005). The original model (Figure 1) is over-identified, and makes several strong claims of full mediation with anticipated null direct effects after controlling for indirect effects. Modification indices were consulted in the case of poor initial model fit to identify theoretically plausible paths (such as adding direct effects) that ensured acceptable fit for the model overall.

3 | RESULTS

3.1 | Study characteristics

A total of 91 articles, including 97 independent studies, met full inclusion criteria (see Figure 2 for a flowchart). Fourteen of these were unpublished studies. Most studies were cross-sectional. Five studies employed a prospective design (i.e., three employed a 7–10 day experience sampling design, and two employed a follow-up assessment several years after baseline) and a further six studies assessed intuitive eating before and after an intervention. In all cases, cross-sectional baseline data were available for analyses. Most studies (n = 90) assessed intuitive eating via one of Tylka's scales, while only seven studies using the scale developed by Hawks et al. (2004). Most studies sampled non-clinical student or community populations, and only four studies sampled individuals with a clinically significant eating disorder. Caucasian women were mostly sampled across included studies, although there was some diversity with respect to racial and ethnic backgrounds. Quality ratings also varied, with the mean rating being 3.64 (SD = 0.76, min = 2 and max = 6). Sub-optimal quality ratings mostly came from few studies (8%) providing evidence for the comparability between survey respondents and non-respondents, (30%), the complete reporting of results (i.e., p-values and confidence intervals; 29%), and the justification of sample size (30%). We refer readers to Table 1 for more detail pertaining to study characteristics.

3.2 | Meta-analytic results

Meta-analyses were performed on 23 different psychological correlates of intuitive eating. The results from these meta-analyses are presented in Table 2. Psychological correlates were categorized into one of three clusters (derived posteriori): (a) eating behavior, body image disturbances, and body mass; (b) positive body image and other adaptive factors; and (c) general psychopathology. Of note, these meta-analyses are based on effect sizes derived from non-clinical samples; none of the four studies that sampled individuals with a clinically significant eating disorder investigated intuitive eating's relationship to any of these psychological constructs.

3.2.1 | Eating behavior, body image disturbances, and body mass

Meta-analyses showed that intuitive eating was significantly (ps < .001) and negatively associated with body mass index (r = −.20), binge-purge symptoms (r = −.52), eating restraint (r = −.41), emotional

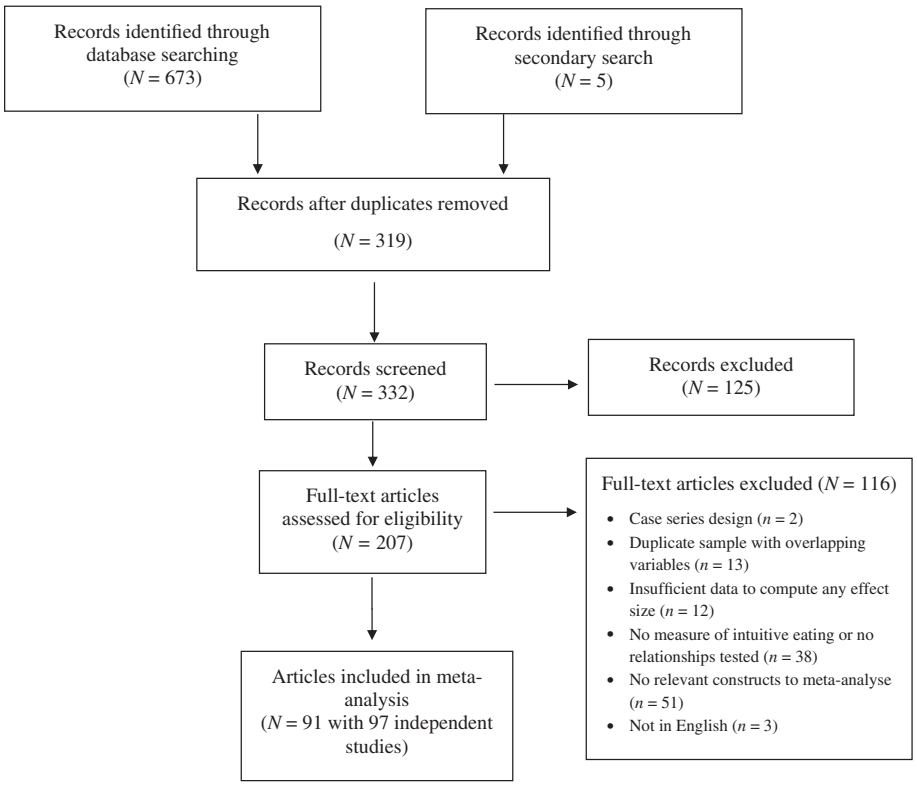

FIGURE 2 Flow-chart of the literature search

TABLE 1 Characteristics of studies included in the meta-analysis

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Akırmak, Bakıner, Boratav, and Güneri (2018) Study 1	Pub	Cross-section	264 adults (82% women) Age = 33.5 (mean) BMI = 22.8 (mean)	NR	IES-2	Eating pathology (EAT-26) Self-esteem (RSE) Anxiety (MOCI)BMI Gender	4
Alleva et al. (2017) Study 1	Pub	Cross-section	253 adults (48% women) Age = 36.3 and 33.6 men and women, respectively BMI = 26.7 and 26.8 men and women, respectively	White (71%) Black (11%) Asian (8%) Latina/o (6%) Multiracial (4%)	IES-2	Body appreciation (BAS-2) Body image flexibility (BIAAQ) Body function (OBCS) Thin ideal internalization (SATAQ) Eating restraint (EDE-Q) Self-esteem (SISE) Anxiety (PROMIS) Depression (PROMIS) Gender	4
Anderson, Reilly, Schaumberg, Dmochowski, and Anderson (2016)	Pub	Cross-section	125 undergraduates (64% women) Age = 19.3 BMI = 23.0	Caucasian (65%) African American (14%) Asian (12%) Other (5%)	IES	Eating restraint (TFEQ) Eating pathology (EDDS) BMI	4
Andrew et al. (2015)	Pub	Cross-section	400 adolescent girls (100% women) Age = 14.1 years BMI = 20.9	Caucasian (84%) Asian (10%) African (1%) Aboriginal (1%) Other (4%)	IES-adolescent	Body acceptance by others (BAOS) Body function (OBCS) Body appreciation (BAS)	3
Augustus-Horvath and Tylka (2011)	Pub	Cross-section	(a) 318 emerging adult women Age = 19.4 BMI = 23.9 (b) 238 early adult women Age = 32.6 BMI = 25.5 (c) 245 middle adult women Age = 51.3 BMI = 28.8	White (81, 83, and 84.1%) African American (7, 6, and 5.7%) Asian American (6, 3, and 3%)	IES	BMI Body acceptance by others (BAOS) Body appreciation (BAS) Body function (OBCS) Social support from others (PSS)	4
Avalos and Tylka (2006) Study 1	Pub	Cross-section	181 college women (100% women) Age = 20.2 BMI = NR	European American (82%) Multiracial (8%) African American (5%) Asian American (4%) native American (1%)	IES	Unconditional acceptance from other (BLRI) Body acceptance by others (BAOS) Body function (OBCS) Body appreciation (BAS)	5
Avalos and Tylka (2006) Study 2	Pub	Cross-section	416 college women (100% women) Age = 19.9 BMI = NR	European American (78%) Multiracial (6%) African American (9%) Asian American (5%) Latina (2%)	IES	Unconditional acceptance from other (BLRI) Body acceptance by others (BAOS) Body function (OBCS) Body appreciation (BAS)	5
Barrada, Cativiela, Van Strien, and Cebolla (2020)	Pub	Cross-section	1,095 Spanish adults (73% women) Age = 24.8 BMI = 22.4	NR	IES-2	Emotional eating (DEBQ) Eating restraint (DEBQ) External eating (DEBQ) Negative affect (PANAS) Positive affect (PANAS) Life satisfaction (SWLS) Shape/weight concerns (EDI-BD) BMI	3

(Continues)

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Bardone-Cone et al. (2019)	Pub	Cross-section	15 ED patients and 27 healthy controls (0% women) Age = 26.9 and 26.4 BMI = 25.6 and 24.4	White (79 and 78%) Latino (13 and 15%)	IES	ED diagnosis	4
Bas et al. (2017)	Pub	Cross-section	377 university students (57% women) Age = 21.1 BMI = 22.5 (women) and 23.9 (men)	NR	IES-2	BMI Eating pathology (EAT-26 and EDE-Q global) Weight concern (EDE-Q) Shape concern (EDE-Q) Eating restraint (EDE-Q) Body appreciation (BAS)	3
Belon (2016)	Unpub	Cross-section	479 university students (74% women) Age = 20.8 BMI = 23.9	White (60%) American Indian (6%) Multiracial (5%) African American (4%) Asian (3%)	IES-2	Gender BMI Eating pathology (EDE-Q global) Emotional eating (DEBQ) Shape/weight concerns (BSQ) Mental health/wellbeing (MHI)	3
Belur (2018)	Unpub	Cross-section	73 adult women (100% women) Age = 31.4 BMI = NR	Caucasian (47%) Asian (32%) Hispanic (10%) Multiracial (6%) African American (4%) Native American (1%)	IES-2	Mindfulness (FFMQ) BMI Body appreciation (BAS-2) Eating pathology (EAT-26) Eating restraint (EAT-26 subscale) Bulimia (EAT-26 subscale)	4
Bilici, Kocaadam, Mortas, Kucukerdonmez, and Koksal (2018)	Pub	Cross-section	665 adults (82% women) Age = 20.9 BMI = 21.8	NR	IES-2	BMI Gender	4
Bruce (2017)	Unpub	Cross-section	457 adult women (100% women) Age = 38.1 BMI = 26.1	White (89%)	IES	BMI Body acceptance by others (BAOS) Body function (OBCS) Body appreciation (BAS) Pressure for thinness (PSSS) Appearance ideal internalization (SATAQ) Negative affect (PANAS) Social support from others (PSS)	4
Carbonneau et al. (2016) Study 1	Pub	Cross-section	260 adult women (100% women) Age = 29.8 BMI = 25.8	White (95%) African American (2%) Asian (2%) Hispanic (1%)	IES-2	Interoceptive awareness (EDI subscale) Shape/weight concern (EDI subscale) Bulimia (EDI subscale) Wellbeing/life satisfaction (SWLS)	4
Carbonneau et al. (2016) Study 2	Pub	Cross-section	149 adults (49% women) Age = 47.4 BMI = 25.1	White (95%) African American (1%) Arab (1%) Native American (1%) Latina (1%)	IES-2	Gender	4
Cardoso, Oliveira, and Ferreira (2020)	Pub	Cross-section	273 adult women (100% women) Age = 24.1 BMI = 22.6	NR	IES-2	BMI Negative affect (PANAS) Positive affect (PANAS) Body image flexibility (BIAAQ) Eating pathology (EDE-Q global)	3
Carney (2017)	Unpub	Intervention	121 adults (52% women) Age = NR BMI = NR	White (49%) Asian (7%) African American (28%) Hispanic (8%) Mixed (4%)	IES (2004)	Stress (PSS) Gender	2

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Coimbra and Ferreira (2020)	Pub	Cross-section	451 adult women (100% women) Age = 33.8 BMI = 24.0	NR	IES-2	Eating restraint (IEQ) BMI Eating pathology (EDE-Q global)	3
Craven and Fekete (2019)	Pub	Cross-section	196 adult women (100% women) Age = 20.1 years BMI = 27.6	White (84%) Black (8%) Asian (4%) Biracial (4%)	IES-2	Binge eating (BES) Shape/weight concerns (WEB-SG)	3
Da Silva, Neves, Ferreira, Duarte Bonini Campos, and Swami (2020)	Pub	Cross-section	288 adults (53% women) Age = 24.0 BMI = 24.1	White (86%) Multiracial (6%) Black (4%)	IES-2	Body appreciation (BAS) Gender BMI	3
Daundasekara et al. (2017)	Pub	Cross-section	266 pregnant women (100% women) Age = 30.6 BMI = 25.3	White 52%) Black (9%) Hispanic (25%) Asian (11%) American Indian (0.4%)	IES	Depression (EPDS) BMI	5
Dittmann and Freedman (2009) Sample 1	Pub	Cross-section	157 adult women (100% women) Age = 47.5 BMI = 22.2	NR	IES	Mindfulness (FFMQ) BMI	3
Dockendorff (2011)	Unpub	Cross-section	256 school-aged children (53% women) Age = 12.4 BMI = 21.1	Caucasian (68%) Hispanic (16.8%) African American (8.6%) Asian (2.7%)	IES	BMI Wellbeing/life satisfaction (SWLS) Negative affect (PANAS) Positive affect (PANAS) Gender	3
Duarte, Ferreira, Pinto-Gouveia, Trindade, and Martinho (2017)	Pub	Cross-section	905 community-based adults (73% women) Age = 22.3 women and 24.7 men BMI = 21.6 women and 23.7 men	NR	IES-2	Eating restraint (IEQ)	4
Duarte, Gouveia, and Mendes (2016)	Pub	Cross-section	1,013 community-based adults (51% women) Age = 28.3 BMI =22.6	NR	IES-2	Eating pathology (EDE-Q global) Binge eating (BES) Body image flexibility (BIAAQ) Depression (DASS) Anxiety (DASS) Stress (DASS) BMI Gender	4
Engels (2012)	Unpub	Intervention	34 overweight/obese treatment-seeking women (100% women) Age = 46.7 BMI = 31.4	Caucasian (82%) Hispanic (3%) Native American (3%) African American (3%)	IES-2	BMI Binge eating (BES) Satisfaction with life/wellbeing (SWLS)	3
Galloway, Farrow, and Martz (2010)	Pub	Cross-section	98 students (72% women) Age = 18.5 (men and women) BMI = 24.2 for women and 25.1 for men	White (96%) African American (3%) Asian American (1%)	IES	Gender	3
Ge (2018)	Unpub	Cross-section	664 adults (55% women) Age = unclear BMI = NR	NR	IES-2	Gender BMI	4
Hawks, Madanat, and Smith (2005)	Pub	Cross-section	32 female students (100% women) Age = NR BMI = NR	NR	IES (2004)	BMI	4
Hawks et al. (2004)	Pub	Cross-section	364 undergraduate students (42% women) Age = 20.6 BMI = NR	Caucasian (88%) Hispanic (7%) Other (5%)	IES (2004)	Gender	4

(Continues)

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Hazzard et al. (2020)	Pub	Prospective	1,480 adolescents (54% women) Age = 14.5 BMI = NR	White (19%) Black (28%) Hispanic (17%) Asian (20%)	3-item IES	Depression (KMDMD) Self-esteem (RSE) Shape/weight concerns (BSS) Binge eating (QEWP)	4
Herbert, Blechert, Hautzinger, Matthias, and Herbert (2013)	Pub	Cross-section	120 female students (100% women) Age = 25.4 BMI = 22.1	NR	IES	BMI Anxiety (STAI)	3
Hoffman (2017)	Unpub	Cross-section	68 adult males (0% women) Age = NR BMI = NR	Caucasian (73%) African American (2.9%) Arab (1.5%) Hispanic (13.2%) Multi-racial (1.5%)	IES-2	Eating pathology (ESP) Anxiety (BSI)	5
Homan and Tylka (2018)	Pub	Cross-section	263 adult women (100% women) Age = 35.2 BMI = NR	White (78%) African American (11%) Asian American (5.3%) Latin American (4.6%) Native American (1.5%) Multiracial (1.1%)	IES	Body appreciation (BAS)	5
Horwath, Hagmann, and Hartmann (2019)	Pub	Cross-section	5,238 adults (49% women) Age = 56.4 BMI = 24.8	NR	IES-2	BMI Gender	3
Howell (2018)	Unpub	Cross-section	384 adult women (100% women) Age = 21.9 BMI = 24.7	White (76.6%) American Indian (6.6%) African American (6.1%) Hispanic (4.3%) Biracial (3.0%) Asian American (2.5%)	IES-2	Mindfulness (FFMQ) Body appreciation (BAS) BMI	5
Iannantuono and Tylka (2012)	Pub	Cross-section	249 college women (100% women) Age = 19.1 BMI = 23.1	White (86.3%) African American (4.8%) Latina (2.8%) Asian American (2.4%) multiracial (2.4%)	IES	Depression (BDI) body appreciation (BAS) BMI	5
Keirns and Hawkins (2019)	Pub	Cross-section	136 adults (73% women) Age = 34.4 BMI = 31.1	White (55.9%) African American (5.9%) American Indian (23.5%) Asian (1.5%) Hispanic (2.9%) multiracial (8.8%)	IES-2	Shape/weight concern (EDE-Q)	3
Kelly and Stephen (2016)	Pub	7-day EMA	92 female students (100% women) Age = 19.7 BMI = 22.6	White (50%) East Asian (21%) Southeast Asian (1.6%) African (4.8%) South Asian (9.7%) Middle Eastern (1.6%) West Indian (1.6%) Aboriginal (1.6%)	IES-2	Self-compassion (SCS-SF) Body appreciation (BAS) Shape/weight concerns (EDE-Q) Negative affect (PANAS)	3

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Kelly, Miller, and Stephen (2016)	Pub	7-day EMA	92 female students (100% women) Age = 19.7 BMI = 22.6	White (50%) East Asian (21%) Southeast Asian (1.6%) African (4.8%) South Asian (9.7%) Middle Eastern (1.6%) West Indian (1.6%) Aboriginal (1.6%)	IES-2	Self-esteem (RSE) Eating restraint (EDE-Q)	3
Kerin, Webb, and Zimmer-Gembeck (2019)	Pub	Cross-section	2018 female students (100% women) Age = 23.1 BMI = NR	White (73.5%) Asian (14.1%) African (2.9%) Pacific Islander (2.5%) Aboriginal (2%) South American (0.9%) African American (0.3%)	IES	Eating restraint (DEBQ) Emotional eating (DEBQ) External eating (DEBQ)	3
Koller, Thompson, Miller, Walsh, and Bardone-Cone (2020)	Pub	Cross-section	19 women with an eating disorder and 31 healthy controls (100% women) Age = 31.7 and 32.3 BMI = NR	White (93%)	IES-2	Eating disorder diagnosis	6
Kroon Van Diest and Tylka (2010) Study 1	Pub	Cross-section	238 college students (67% women) Age = 20.8 BMI = 24.8	Caucasian (91.6%) African American (2.5%) Asian American (2.5%) Multiracial (2.9%) Native American (0.4%)	IES	BMI Body acceptance by family (BAOS) Body appreciation (BAS)	4
Lee, Williams, and Burke (2020)	Pub	Cross-section	419 post-pregnant adult women (100% women) Age = 32.0 BMI = 26.5	NR	IES (2004)	BMI Shape/weight concerns (BSQ) Eating pathology (EAT-26) Depression (EPDS)	3
(Lemoine et al., 2018)	Pub	Cross-section	1,012 young adolescents/adults from Sweden, Portugal and Denmark (52% women) Age = 15.1 BMI = 21.0	NR	IES-2	Body appreciation (BAS-2) Self-esteem (RSE) Wellbeing (KIDSCREEN-27) BMI Gender	3
Linardon et al. (2019)	Pub	Cross-section	990 community-based adults (90% women) Age = 29.5 BMI = 24.5	White (80%) African American (1%) Hispanic (6%) Asian (8%) Native American (0.5%) Pacific Islander (0.6%)	IES-2	Gender BMI Eating restraint (EDE-Q) Shape/weight concerns (EDE-Q) Eating pathology (EDE-Q) Flexible eating restraint (TFEQ) Rigid eating restraint (TFEQ) Depression (DASS) Anxiety (DASS) Stress (DASS) Body image flexibility (BIAAQ) Binge eating (EDE-Q)	3

(Continues)

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Linardon and Mitchell (2017)	Pub	Cross-section	375 community-based adults (80% women) Age = 25.1 BMI = 24.4	NR	IES-2	Gender Eating restraint (EDE-Q) Shape/weight concerns (EDE-Q) Eating pathology (EDE-Q) Flexible eating restraint (TFEQ) Rigid eating restraint (EDE-Q) Binge eating (BES) Emotional eating (EES) Body appreciation (BAS)	4
Luo, Niu, Kong, and Chen (2019)	Pub	Cross-section	1,152 Chinese adolescent girls (100% women) Age = 13.1 BMI = 17.7	100% Chinese	IES	BMI Body appreciation (BAS-2)	3
MacDougall (2010)	Unpub	Cross-section	130 African American college women (100% women) Age = 26.7 BMI = NR	African American (100%)	IES	Unconditional acceptance from others (BLRI) Body acceptance by others (BAOS) Body function (OBCS) Body appreciation (BAS)	5
Madanat and Hawks (2004)	Pub	Cross-section	336 students from Jordan (77% women) Age = 20.0 BMI = NA	NR	IES (2004)	Gender	3
Meneses, Torres, Miller, and Barbosa (2019)	Pub	Cross-section	202 older adults (59% women) Age = 70.1 BMI = 26.9	NR	IES-2	Body appreciation (BAS-2)	5
Mendes (2014)	Unpub	Cross-section	545 female adults (100% women) Age = 28.3 BMI = 22.7	NR	IES-2	BMI Binge eating (BES) Eating pathology (EDE-Q) Shape/weight concerns (EDE-Q) Eating restraint (EDE-Q) Depression (DASS) Anxiety (DASS) Stress (DASS)	3
Moy, Petrie, Dockendorff, Greenleaf, and Martin (2013)	Pub	Cross-section	1,377 middle school students (51% women) Age = 12.3 BMI = NR	White/non-Hispanic (65%) White/Hispanic (22%) Black (9.5%) Asian (3.7%) Native American (0.8%)	IES	Gender	4
Nagel (2016)	Unpub	Cross-section	158 adults (68% women) Age = 23.9 BMI = 25.4	Hispanic (12%) Non-Hispanic (11%) Asian (5%) White (70%)	IES-2	BMI Eating restraint (DIS)	3
Nejati et al. (2020)	Pub	Cross-section	762 overweight Iranian women with breast cancer (100% women) Age = 55.1 BMI = 30.3	NR	IES-2	Depression (HADS) Anxiety (HADS) Mental health/wellbeing(SF-12) Eating pathology (EAT-26) Body appreciation (BAS-2)	3
Nielsen and Powell (2015)	Pub	Cross-section	394 undergraduate students (67% women) Age = 21.6 (males) and 21.4 (females) BMI = NR	NR	IES	Eating restraint (TFEQ) Binge eating (EDDS) Emotional eating (TFEQ)	3

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Oh et al. (2012)	Pub	Cross-section	157 college women athletes (100% women) Age = 19.8 BMI = 22.7	White (88.8%) African American (4.4%) Latina (2.5%) Biracial (2.5%)	IES	Unconditional acceptance from others (BLRI) Body acceptance by others (BAOS) Body function (OBCS) Body appreciation (BAS)	3
Oswald, Chapman, and Wilson (2017)	Pub	Cross-section	200 female undergraduate students (100% women) Age = 22.1 BMI = 23.9	White (89%) Asian (4%) African (1%) Aboriginal (4.6%)	IES	Body appreciation (BAS) Interoceptive awareness (BAQ)	4
Özkan and Bilici (2020)	Pub	Cross-section	250 adults (73% women) Age = 25.3 BMI = 25.2	NR	IES-2	Gender	3
Palascha, van Kleef, de Vet, and van Trijp (2020)	Pub	Cross-section	1,200 adults (51% women) Age = NR BMI = NR	NR	IES-2	Body appreciation (BAS-2) Self-esteem (SISE) Life satisfaction/wellbeing (SWLS) Binge eating (MAEDS) Eating restraint (MAEDS) BMI	5
Papini (2015)	Unpub	Intervention	51 undergraduate females (100% women) Age = NR BMI = NR	White (49%) Hispanic (33%) African American (6%)	IES	Self-compassion (SCS-SF) Binge eating (BES)	4
Reel, Galli, Miyairi, Voelker, and Greenleaf (2016)	Pub	Cross-section	514 adults (65% women) Age = 25.1 BMI = 25.1	White (71%) Hispanic (9%) Asian American (1.1%) Black (0.8%) American Indian (1.1%)	IES	BMI Body appreciation (BAS)	3
Reichenberger, Smyth, Kuppens, and Blechert (2019) Study 1	Pub	10-day EMA	49 students (100% women) Age = 23.4 BMI = 22.0	NR	IES	Eating restraint (DEBQ) External eating (DEBQ) Emotional eating (DEBQ)	3
Reichenberger et al. (2019) Study 2	Pub	10-day EMA	59 adults (78% women) Age = 39.9 BMI = 26.7	NR	IES-2	Restraint (DEBQ) External eating (DEBQ) Emotional eating (DEBQ)	3
Richard et al. (2019)	Pub	Cross-section	44 women with anorexia nervosa 42 healthy controls (100% women) Age = 22.5 (AN) and 22.0 (HC) BMI = 15.4 (AN) and 21.8 (HC)	NR	IES-2	Eating disorder diagnosis BMI	4
Richards et al. (2017)	Pub	Intervention	120 women with eating disorders (100% women) Age = 21.2 BMI = NR	Caucasian (90%)	IES (2004)	Eating pathology (EAT-26) Shape/weight concerns (BSQ)	3
Roberts, Carbonneau, Goodman, and Musher-Eizenman (2020)	Pub	Cross-section	263 mother–daughter dyads (100% women) Age = 29.3 BMI = NR	Caucasian (94%)	IES-2	Eating restraint (CFPQ) Emotional eating (TFEQ) BMI	3
Romano, Swanbrow Becker, Colgary, and Magnuson (2018)	Pub	Cross-section	867 college (100% women) Age = 24.4 BMI = 24.3	White (77%)	IES-2	Eating pathology (EDE-Q) Eating restraint (EDE-Q) Shape/weight concerns (EDE-Q)	3

(Continues)

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Ruzanska and Warschburger (2019)	Pub	Cross-section	532 adults (82% women) Age = 39.8 BMI = 24.8	NR	IES-2	Emotional eating (DEBQ) External eating (DEBQ) Eating restraint (DBEQ) Eating pathology (SCOFF) Binge eating (EDE-Q) Mental health/wellbeing (SF-36 MC) BMI Gender	3
Sairanen et al. (2015)	Pub	Intervention	306 overweight/obese adults (84% women) Age = 48.9 BMI = 31.3	NR	IES	Mindfulness (FFMQ) BMI	3
Saunders, Nichols-Lopez, and Frazier (2018)	Pub	Cross-section	482 college students (77% women) Age = 21.3 BMI = 24.6	Cuban (37.6%) South American (20.7%) Central American (8.2%) Dominican (4%) Puerto Rican (3.6%) Mexican (1.8%)	IES-2	Gender Eating pathology (EAT-26)	3
Schoenefeld and Webb (2013)	Pub	Cross-section	322 female undergraduate students (100% women) Age = 19.4 BMI = 23.5	European American (67%) African American (21%) Latina (5.8%) Asian (3.2%) American Indian (1.6%) Pacific Island (1.%)	IES	Self-compassion (SCS) Body image flexibility (BIAAQ) Self-esteem (RSE) BMI	4
Shouse and Nilsson (2011)	Pub	Cross-section	140 female students (100% women) Age = 20.8 BMI = NR	White (52%) African American (36%) Asian American (4%) Hispanic (4%)	IES	Eating pathology (EAT-26)	3
J. M. Smith, Serier, Belon, Sebastian, and Smith (2020)	Pub	Cross-section	478 college students (74% women) Age = 21.0 BMI = 24.0	White (64%)	IES-2	Eating restraint (EDE-Q) Emotional eating (DEBQ) Gender BMI	4
T. S. Smith and Hawks (2006)	Pub	Cross-section	343 undergraduate students (60% women)	Caucasian (90%) Hispanic (4.1%) Asian (2.4%) American Indian (1.8%)	IES (2004)	BMI Gender	3
Smitham (2010)	Unpub	Intervention	31 adults with binge-eating disorder (99% women) Age = 44.3 BMI = 39.0	Caucasian (90%)	IES	Binge eating Eating pathology (EDI) Depression (BDI) Anxiety (BAI)	5
Soares et al. (2020)	Pub	Cross-section	179 adults (74% women)	White (27%)	IES-2	Gender	3
Soulliard and Vander Wal (2019)	Pub	Cross-section	223 sexual minority adults (53% women) Age = 32.4 BMI = NR	Hispanic (10%) Non-Hispanic (90%)	IES-2	Gender Body image flexibility (BIAAQ) Body appreciation (BAS-2)	3
Swami et al. (2020)	Pub	Cross-section	921 Malaysian adults (51% women) Age = 33.8 BMI = 24.1	607 Malay ancestry 314 Chinese ancestry	IES-2	BMI Body appreciation (BAS-2) Weight/shape concerns (MBSRQ) Appearance ideal internationalization (SATAQ) Life satisfaction/wellbeing (SWLS) Gender	4

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Szymanski and Feltman (2015)	Pub	Cross-section	253 adult women (100% women) Age = 19.5 BMI = NR	White (84%) African American (3%) Asian American (3%) Latina (1%) Native American (3%) Biracial (2%)	IES-2 BFC subscale	Internalization of appearance ideal (SATAQ) Shape/weight concerns (OBSC) Depression (CES-D) Self-esteem (RSE)	4
Tylka (2006) Study 1	Pub	Cross-section	391 female undergraduate students (100% women) Age = 20.8 BMI = NR	Caucasian (88%) Asian American (3.8%) Multiracial (3.4%) African American (3.1%) Native American (2.8%) Latina (0.5%)	IES	Eating pathology (EAT-26) Shape/weight concerns (BDI) Interoceptive awareness (EDI) Pressure for thinness (PSPS) Appearance ideal internalization (SATAQ)	4
Tylka (2006) Study 2	Pub	Cross-section	476 female undergraduate students (100% women) Age = 19.7 BMI = NR	Caucasian (86%) Asian American (5.3%) Multiracial (3.4%) African American (3.9%) Native American (2.4%) Latina (2.1%)	IES	Life satisfaction (SWLS) Self-esteem (RSE)	4
Tylka (2006) Study 3	Pub	Cross-section	199 female undergraduate students (100% women) Age = 18.8 BMI = 23.5	Caucasian (75%) Asian American (4%) Multiracial (1.5%) African American (13%) Native American (2.4%) Latina (2%)	IES	BMI	4
Tylka, Calogero, and Danielsdottir (2015)	Pub	Cross-section	382 adults (51% women) Age = 33.8 BMI = 26.5	White (72%) African American (8.4%) Asian American (9.2%) Latin American (6.3%) Native American (0.5%) Multiracial (3.6%)	IES-2	Flexible eating restraint (TFEQ) Rigid eating restraint (TFEQ) Life satisfaction (SWLS) Positive affect (PANAS) Negative affect (PANAS) Interoceptive awareness (EDI) Binge eating (BES) Body appreciation (BAS-2) BMI Gender	4
Tylka and Homan (2015)	Pub	Cross-section	406 students (63% women) Age = 19.6 BMI = 23.7 (men) and 22.5 (women)	White (88%) African American (5%) Asian American (2%) Latin American (6.3%) Native American (2%) Multiracial (1%)	IES	Body acceptance by others (BAOS) Body appreciation (BAS) Body function (OBCS) Gender	4
Tylka, Lumeng, and Eneli (2015)	Pub	Cross-section	180 mothers (100% women) Age = 34.3 BMI = 26.1	Caucasian (71%) African American (17%) Asian (8%) Latina (2%) Native American (2%)	IES	BMI	3
Tylka and Kroon Van Diest (2013) Study 1	Pub	Cross-section	878 adults (55% women) Age = 20.4 BMI = NR	White (77%) African American (13%) Asian American (4%) Latina (1.3%) Native American (0.7%) Multiracial (3%)	IES-2	Gender	4

(Continues)

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Tylka and Kroon Van Diest (2013) Study 2	Pub	Cross-section	1,200 adults (56% women) Age = 20.4 BMI = 24.0 (women) and 25.3 (men)	White (81%) African American (6%) Asian American (4%) Latina (1.8%) Native American (0.1%) Multiracial (5%)	IES-2	Gender Eating pathology (EAT-26) Interoceptive awareness (EDI) Body appreciation (BAS) Body function (OBCS) Shape/weight concerns (OBCS) Appearance ideal internalization (SATAQ) Self-esteem (RSE) Positive affect (PANAS) Negative affect (PANAS) Life satisfaction/wellbeing (SWLS) BMI	4
Tylka and Kroon Van Diest (2013) Study 3	Pub	Cross-section	522 college students (45% women) Age = 20.3 BMI = NR	White (78%) African American (5.4%) Asian American (4.8%) Latina (1%) Native American (0.4%) Multiracial (6%)	IES-2	Gender	4
Tylka and Wilcox (2006) Study 1	Pub	Cross-section	338 college women (100% women) Age = 18.4 BMI = NR	White (86%) African American (5.3%) Asian American (5%) Latina (2%) Multiracial (1.8%)	IES	Eating restraint (EAT-26) Bulimia/food preoccupation (EAT-26) Positive affect (PANAS) Self-esteem (RSE)	4
Tylka and Wilcox (2006) Study 2	Pub	Cross-section	396 college women (100% women) Age = 18.7 BMI = NR	White (82%) African American (8.3%) Asian American (4.3%) Latina (1.8%) Multiracial (1.3%)	IES	Dieting (EAT-26) Bulimia/food preoccupation (EAT-26) Gender	4
Tylka and Wood-Barcalow (2015) Study 1	Pub	Cross-section	675 college students (54% women) Age = 20.3 BMI = 24.2	White (79%) African American (11%) Asian American (4%) Latina/o (0.7%) Native American (0.3%) Multiracial (5%)	IES-2	Body appreciation (BAS-2) Weight/shape concern (BSQ for women, MBAS for men) Internalization of appearance ideal (SATAQ) Body function (OBSC) Self-esteem (RSE) Eating pathology (EAT-26) Gender	5
Van Dyck, Herbert, Happ, Klevernan, and Voegele (2016)	Pub	Cross-section	1,134 adults (81% women) Age = 26.3 BMI = 22.7 (women) and 24.0 (men)	NR	IES-2	Gender Eating restraint (DEBQ) Emotional eating (DEBQ) External eating (DEBQ) Shape/weight concerns (EDI) Bulimia (EDI) Interoceptive awareness (IAQ) BMI Anxiety (STAI) Eating disorder diagnosis	3
Vintilă et al. (2020)	Pub	Cross-section	830 Romanian adults (59% women) Age = 26.8 BMI = 23.6	NR	IES-2	Gender Body appreciation (BAS-2) Eating pathology (BISQ) Self-esteem (RSE) Wellbeing/life satisfaction (SHS) BMI	3

TABLE 1 (Continued)

Reference	Source	Design	Brief sample description	Race and/or ethnicity	IE measure	Psychological correlates meta-analyzed	Quality score
Waring and Kelly (2020)	Pub	Cross-section	87 female students (100% women) Age = 20.5 BMI = 22.4	Southeast Asian (35%) White (20%) South Asian (20%) Black (6%) West Asian (3%) Arab (1%) Latina (1%)	IES-2	Body appreciation (BAS-2)	3
Webb, Hardin, Schoenefeld, Fiery, and Chou (2013)	Pub	Prospective	134 female undergraduate students (100% women) Age = 24.10 BMI = NR	White (60%) Black (40%)	IES	Mindfulness (CAMS-R) BMI	3
Webb and Hardin (2016)	Pub	Cross-section	333 collage women (100% women) Age = 19.4 BMI = 23.4	Black (20%) White (63%) Hispanic (6%) Asian (4%) Multiracial (6%)	IES-2	BMI Self-compassion (SCS) Weight/shape concerns (BISS) Body image flexibility (BIAAQ)	5

Abbreviations: BAOS, Body Acceptance of Others Scale; BAS, body appreciation scale; BDI, Beck Depression Inventory; BES, binge-eating scale; BIAAQ, Body image acceptance action questionnaire; BISQ, Body Image Screening Questionnaire for Eating Disorder Early Detection; BISS, body image shame scale; BLRI, Barrett–Lennard Relationship Inventory; BSQ, body shape questionnaire; CAMS-R, Cognitive and Affective Mindfulness Scale-Revised; DASS, Depression Anxiety Stress Scale; DEBQ, Dutch eating behavior questionnaire; DIS, dietary intent scale; EAT, eating attitudes test; EDDS, Eating disorder diagnostic scale; EDE-Q, eating disorder examination questionnaire; EDI, eating disorder inventory; FFMQ, The Five Facet Mindfulness Questionnaire; FPQ, food preoccupation questionnaire; HADS, hospital depression anxiety scale; IAQ, interoceptive awareness questionnaire; IEQ, Inflexible Eating Questionnaire; IES, Intuitive Eating Scale; MASS, Mindful Attention Awareness Scale; MBAS, male body attitudes scale; NR, not reported or unclear; OBSC, Objectified Body Consciousness Scale; OQ, outcome questionnaire; PANAS, positive and negative affect schedule; PROMIS, Patient-Reported Outcomes Measurement Information System; PSPS, Perceived Sociocultural Pressures Scale; PSS, perceived social support scale; Pub, published; QEWP, questionnaire for eating and weight patterns; RSE, Rosenberg self-esteem scale; SATAQ, socio-cultural attitudes toward appearance questionnaire; SCS, self-compassion scale; SF-36 MC, Short-form 36 mental health composite; SHS, subjective happiness scale; SISE, Single Item Self-Esteem; STAI, state trait anxiety inventory; SWLS, satisfaction with life scale; TFEQ, three factor eating questionnaire; unpub, unpublished; WEB-SG, Weight-Related and Body-Related Shame and Guilt Scale.

eating (r = −.58), external eating (r = −.23), global levels of eating disorder psychopathology (r = −.47), internalization of appearance ideals (r = −.21), poor interoceptive awareness (r = −.49), and shape and weight concerns (r = −.46). Effect sizes ranged from small to large. Heterogeneity ranged from low (I^2 = 0%) to high (I^2 = 97%). See Table 2 for the pooled effect sizes, 95% confidence intervals, number of effect sizes contributing to each meta-analysis, total sample size per meta-analysis, and heterogeneity estimate.

3.2.2 | Positive body image and other adaptive factors

Meta-analyses showed that intuitive eating was significantly (ps < .001) and positively associated with body acceptance by others (r = .37), body appreciation (r = .48), body image flexibility (r = .58), body function (r = .39), mindfulness (r = .30), positive affect (r = .24), self-compassion (r = .41), self-esteem (r = .36), social support (r = .20), and general wellbeing (r = .33). Heterogeneity ranged from low (0%) to high (89%).

3.2.3 | General psychopathology

Meta-analyses showed that intuitive eating was significantly (ps < .001), negatively, and moderately associated with anxiety symptoms (r = −.34), depressive symptoms (r = −.29), and negative affect (r = −.29). The relationship between intuitive eating and stress levels (r = −.15) was non-significant (p = .058).

Meta-regressions

Results from the meta-regressions are presented in Table 3. As seen, few statistically significant (p < .001) moderators were detected. We found evidence that intuitive eating's relationship with (a) shape and weight concerns was stronger in samples with more Caucasian participants and weaker in samples with more Asian participants, (b) body appreciation was stronger in samples with more female participants, (c) depressive symptoms was stronger in older mean age samples, and (d) BMI was weaker in samples with more Asian participants.

3.2.4 | Gender differences

A moderate pooled effect size emerged from the comparison of men versus women on intuitive eating scores (d = 0.39; 95% CI = 0.23, 0.48, p < .001), indicating that men reported higher levels of intuitive eating than women. Thirty-six effect sizes contributed to this pooled effect, with a total sample size of 9,174 men and 13,765 women. There was high heterogeneity (I^2 = 89%). Neither body mass (b = −.01, p = .101) nor sample age (b = −.01, p = .311) were significantly associated with the effect sizes. However, a significant, positive relationship between the percentage of Caucasian participants and effect sizes emerged (b = 0.01, p = .001), indicating that gender

TABLE 2 Meta-analyses on the relationship between intuitive eating and psychological correlates

Psychological construct	*k*	*n*	*r* (95% CI)	I^2
Eating behavior, body image disturbances, and body mass				
Body mass index	68	28,916	−.20 (−.25, −.16)	92%
Binge-purge behaviors	20	9,682	−.52 (−.61, −.41)	97%
Eating restraint	31	14,080	−.41 (−.46, −.35)	92%
Emotional eating	13	7,144	−.58, (−.66, −.48)	96%
External eating	7	4,887	−.23 (−.30, −.15)	83%
Global levels of eating pathology	30	11,996	−.47 (−.54, −.39)	95%
Internalization of appearance ideals	11	4,149	−.21 (−.35, −.07)	95%
Poor interoceptive awareness	9	3,567	−.49 (−.58, −.40)	91%
Shape and weight concerns	25	12,603	−.46 (−.55, −.36)	97%
Positive body image and other adaptive factors				
Body acceptance by others	13	3,186	.37 (.33, .42)	51%
Body appreciation	48	14,905	.48 (.44, .51)	86%
Body image flexibility	7	2,417	.58 (.53, .63)	70%
Body function	17	5,076	.39 (.35, .43)	61%
Mindfulness	5	1,054	.30 (.20, .40)	64%
Positive affect	8	3,546	.24 (.17, .29)	70%
Self-compassion	4	798	.41 (.35, .47)	0%
Self-esteem	22	8,396	.36 (.29, .42)	89%
Social support/acceptance from others	8	2,142	.20 (.15, .25)	31%
Wellbeing/life satisfaction	24	9,559	.33 (.27, .38)	88%
General psychopathology				
Anxiety symptoms	13	5,588	−.34 (−.45, −.23)	94%
Depressive symptoms	12	6,419	−.29 (−.38, −.21)	91%
Negative affect	9	3,755	−.29 (−.35, −.21)	79%
Stress	4	2,828	−.15 (−.28, .01)	93%

Note: All effect sizes are statistically significant at $p < .001$, except stress levels ($p = .053$).

differences in intuitive eating levels were largest in samples with a higher percentage of Caucasian participants.

3.2.5 | Individuals with an eating disorder versus healthy controls

Four studies were identified that compared individuals with clinically significant eating disorders to healthy controls on intuitive eating scores. As expected, a large pooled effect size was observed ($d = 1.80$, 95% CI = 1.60, 1.99, $p < .001$), indicating that healthy controls ($N = 932$) reported substantially higher intuitive eating levels than individuals with eating disorders ($N = 158$). No statistical heterogeneity was observed.

3.2.6 | Acceptance model of intuitive eating

Meta-analytic path models were conducted to test the acceptance model of intuitive eating. In each of the path model Figures, arrows from an independent variable are connected to a dependent variable. For each path, an unstandardized coefficient is provided, which is an estimate of the unique relationship between two variables based on the meta-analytic correlation value. The model as a whole is also evaluated to assess whether it provides an adequate fit to the data.

Fit indices provided mixed support for an adequate model fit for the acceptance model (CFI = .975, TLI = .917, RMSEA = .100, SRMR = .039). Unstandardized coefficients revealed that each path specified in the original model was statistically significant ($p < .001$) and in the expected direction, with the exception of the path from unconditional acceptance from others to body function ($b = .04$, $p = .071$). Inspection of modification indices (MI) revealed that there were eight paths with a MI > 10. We made a decision to add the direct path linking body acceptance by others to intuitive eating (MI = 48.22), given the recent theoretical proposition that those who regularly engage with others who accept their bodies are more likely to experience reprieves from dieting pressures that move individuals away from following their internal hunger and satiety cues (Resch & Tylka, 2019). Therefore, having and engaging with others who accept their bodies may directly help preserve and protect individuals' intuitive eating. With this path added, model fit was acceptable fit (CFI = .991, TLI = .953,

TABLE 3 Meta-regressions predicting effect sizes from covariates

Construct	Covariate	*k*	*b* (*SE*)	*p*
Eating behavior, body image disturbances, and body weight				
Body mass index	Female	67	.00 (.00)	.927
	Caucasian	36	−.00 (.00)	.122
	Black/African American	28	−.00 (.00)	.688
	Asian	27	.00 (.00)	<.001
	Age	64	−.00 (.01)	.320
Binge-purge behaviors	Female	20	−.00 (.00)	.672
	Caucasian	12	.00 (.01)	.931
	Black/African American	11	.01 (.01)	.391
	Age	18	.00 (.01)	.861
	BMI	13	.05 (.02)	.013
Eating restraint	Female	31	.00 (.00)	.469
	Caucasian	16	.01 (.01)	.062
	Black/African American	11	−.01 (.01)	.017
	Asian	12	−.00 (.01)	.388
	Age	29	.01 (.01)	.011
	BMI	23	.05 (.02)	.048
Global eating pathology	Female	30	−.00 (.00)	.629
	Caucasian	17	.00 (.00)	.572
	Black/African American	11	.00 (.00)	.873
	Asian	10	−.00 (.01)	.939
	Age	29	−.00 (.00)	.942
Shape and weight concerns	Female	25	−.00 (.00)	.244
	Caucasian	18	−.01 (.00)	<.001
	Black/African American	14	.01 (.01)	.041
	Asian	16	.01 (.00)	<.001
	Age	25	.00 (.01)	.839
Positive body image and other adaptive factors				
Body appreciation	Female	48	.01 (.00)	<.001
	Caucasian	36	.00 (.00)	.232
	Black/African American	31	.00 (.00)	.509
	Asian	29	−.00 (.00)	.010
	Age	47	.00 (.00)	.631
	BMI	38	.01 (.01)	.358
Body function	Female	17	.00 (.00)	.215
	Caucasian	17	.00 (.00)	.207
	Black/African American	16	−.01 (.00)	.140
	Asian	14	−.00 (.01)	.602
	Age	17	−.00 (.01)	.277
	BMI	12	−.02 (.01)	.236
Self-esteem	Female	18	.00 (.00)	.380
	Caucasian	12	.01 (.01	.018
	Age	23	.00 (.00)	.933
	BMI	15	−.01 (.02)	.771
Wellbeing	Female	23	.00 (.00)	.209
	Caucasian	13	.01 (.00)	.129
	Age	23	−.00 (.00)	.493
	BMI	19	−.00 (.01)	.854

(Continues)

TABLE 3 (Continued)

Construct	Covariate	*k*	*b* (*SE*)	*p*
General psychopathology				
Anxiety symptoms	Female	13	.00 (.00)	.607
	Age	12	.00 (.00)	.924
	BMI	12	.00 (.01)	.668
Depressive symptoms	Female	12	.00 (.00)	.590
	Age	12	−.01 (.00)	<.001
	BMI	10	−.02 (.01)	.008

Note: Female represents % of females in a sample; Caucasian represents % of Caucasian participants in a sample; Age represents mean age of sample; BMI represents mean BMI in a sample. Threshold for statistical significance was adjusted to $p < .001$ to accommodate the larger number of tests performed.

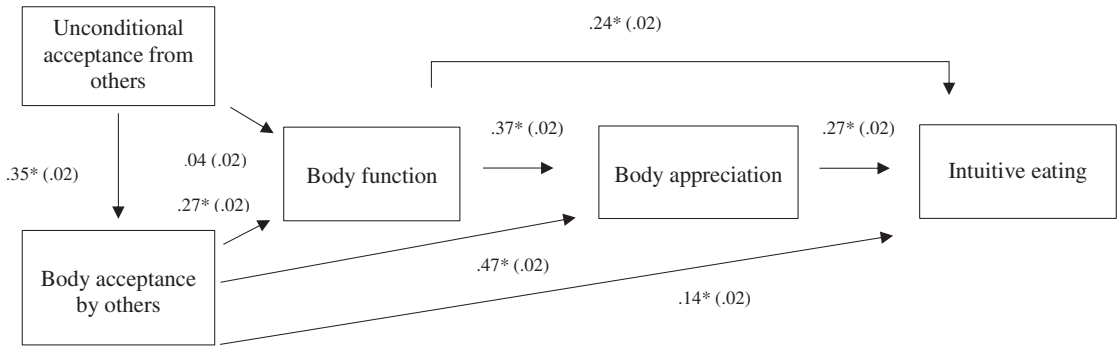

FIGURE 3 Meta-analytic path model testing the acceptance model of intuitive eating. Values reflect unstandardized coefficients. Number of effect sizes and sample size contributing to each path are as follows: Unconditional acceptance to body acceptance by others & body function: $k = 8$, $N = 2{,}142$; Body acceptance by others to body function, body appreciation, and intuitive eating: $k = 8$, $N = 2{,}142$; Body function to body appreciation and intuitive eating: $k = 17$ and $N = 5{,}076$; Body appreciation to intuitive eating: $k = 48$ and $N = 15{,}049$. * $p < .001$

RMSEA = .075, SRMR = .024). All paths were statistically significant (except the path from unconditional acceptance to body function) and in the expected direction. The independent variables combined accounted for 29% of the variance in intuitive eating scores. Figure 3 present the final model and the unstandardized path coefficients.

Subsequent analyses assessed whether the acceptance model could be validated for gender-specific samples. For women-only samples, the original model again yielded mixed support for adequate fit (CFI = .982, TLI = .938, RMSEA = .089, SRMR = .035). Adding the same path from body acceptance by others to intuitive eating (MI = 36.82) resulted in an acceptable model fit (CFI = .992, TLI = .958, RMSEA = .074, SRMR = .023). All paths again (except unconditional acceptance to body function) were statistically significant (*p*s < .001) and in the expected direction. The independent variables combined accounted for 32% of the variance in intuitive eating scores.

For men-only samples, fit statistics were excellent for the original acceptance model (CFI = 1.00, TLI = 1.02, RMSEA = .000, SRMR = .008). All path (*b*s ranged from 0.20 to 0.96) were statistically significant and in the expected direction. The independent variables combined accounted for 24% of the variance in intuitive eating scores. Figures S1 and S2 presents the path models for female and male samples, along with each of the coefficients.

4 | DISCUSSION

We present the first meta-analytic review of intuitive eating and its psychological correlates. A total of 97 independent studies were identified, most of which (89%) were cross-sectional designs. Almost all studies involved non-clinical student or community samples, and a large proportion of participants in these samples were young adult women of Caucasian descent. Few studies included people with an eating disorder, highlighting the importance of further investigating the role of intuitive eating in clinically relevant populations. Twenty-three different intuitive eating correlates, categorized into three broad clusters, were meta-analyzed.

4.1 | Meta-analytic bivariate correlations summary

Meta-analyses revealed moderate to strong pooled effect sizes (*r*s = −.20 to −.58) for intuitive eating's relationship with measures of eating disorder psychopathology and body image disturbances. This suggests that people who are more likely to be guided by their internal hunger and satiety signals are less likely to express concern with weight/shape, buy into societal ideals regarding appearance, and engage in potentially maladaptive eating behaviors,

including purging and binge, emotional, and external eating. These findings may be interpreted in the context of what is known about eating restraint and its incompatibility with intuitive eating. Eating restraint is one of the more established risk and maintaining factors for eating pathology and body image disturbances due to the complex interplay of both biological and psychological mechanisms (Fairburn, Cooper, & Shafran, 2003; Goldschmidt, Wall, Loth, Le Grange, & Neumark-Sztainer, 2012; Polivy & Herman, 1985). Most features of eating restraint, including those strict external food rules that govern what, when, and how much one is allowed to eat, are incompatible with the characteristics that underpin an intuitive eating style, which explains why we observed a moderate-large correlation (r = −.41) between these two variables. In that regard, engaging in a style of eating that honors biological cues, gives oneself permission to eat what is desired, and enables one to opt for foods that serve numerous important functions appears to be more adaptive in the context of eating and body image disturbances than a pattern of eating that is driven largely by self-imposed food rules.

The inverse correlation observed between intuitive eating and body mass (r = −.20) warrants discussion. The traditional belief is that conscious efforts to regulate and restrict food intake is required for sustainable weight control, and that eating based on internal body cues will lead to a pattern of weight gain (Tribole & Resch, 1995). These beliefs have persisted in spite of accumulating evidence against the long-term effectiveness of weight loss diets (Bacon & Aphramor, 2011). The inverse meta-analytic correlation suggests that we cannot rule out the possibility that an internally regulated eating style may also (or instead) assist with, or be relevant to, weight control. Perhaps those who are able to eat intuitively find this pattern of eating more sustainable, are better able to regulate the quality of foods consumed, and are less likely to sporadically consume excess calories through bouts of overeating and binge eating than those who adopt highly restrictive weight loss diets. Alternatively, it could also be that individuals who have a lower BMI experience fewer concerns with their body and the desire to control their weight and shape. As body image disturbances are strong predictors of eating restraint and external food rules (Fairburn et al., 2003), it is possible that the lower body image concerns experienced explain why individuals with a lower BMI are more likely to honor their hunger and satiety cues.

We also found intuitive eating to be significantly associated with a range of adaptive (e.g., positive body image, self-esteem, self-compassion, wellbeing, etc.) and maladaptive (e.g., depressive and anxiety symptoms) psychological constructs. Certain sample characteristics were largely unrelated to these effect sizes, indicating that we were unable to identify any particular demographic subgroup for whom intuitive eating does not covary with these criterion variables. These findings broadly indicate that those whose eating is guided by internal hunger and satiety signals are more likely to report better mental health and wellbeing, greater satisfaction with life, and were more likely to treat themselves and their body with kindness and respect. Future research should now aim to confirm the directions of these relationships, and invest time trying to understand whether intuitive eating is directly linked to these variables, or whether certain intermediate psychological or biological mechanisms account for these relationships.

4.2 | Gender differences in intuitive eating

Existing research on gender differences in intuitive eating has yielded mixed findings, with some studies finding men to report higher intuitive eating levels (e.g., Tylka & Homan, 2015) and others reporting no significant gender differences (e.g., Moy et al., 2013). The pooling of data from 36 independent samples (N = 22,939 participants) enabled us to more accurately test whether any gender differences exist and if there were any sample characteristics affecting this relationship.

We observed a moderate pooled effect size (d = 0.35), indicating that men reported significantly higher intuitive eating levels than women. The magnitude of differences was largest in studies with a higher proportion of Caucasian participants. Both findings were not unexpected and may be interpreted in the context of the cultural pressures men and women face. Unlike many non-Western cultures that tend to value diversity in body shapes and sizes, Westernized cultures tend to place considerable pressure on men and women to look a certain way (i.e., the muscular and thin ideal, respectively; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). However, the pressures placed on women, and the degree to which their bodies are scrutinized on a day-to-day basis, are more frequent and severe than what men generally experience (Fredrickson & Roberts, 1997; Grogan, 2016). Consequently, it is possible that women may feel less encouraged to trust their hunger and satiety signals than men and instead opt for a controlled diet as a method to try to attain thin ideal body type.

4.3 | Acceptance model of intuitive eating

A key aim of this research was to use meta-analytic procedures to validate the pathways specified in the Acceptance Model of Intuitive Eating, a theoretical framework that explains how positive environmental influences can foster intuitive eating practices (Avalos & Tylka, 2006). Overall, the meta-analytic path models fit to the data for mixed and gender-specific samples, accounting for a considerable amount of variance in intuitive eating for mixed gender samples (29%), and for women- and men-specific samples (32 and 24%, respectively).

Most key pathways specified in the Acceptance Model were upheld across our path analyses, providing strong confidence in the generalizability and utility of this model. Unconditional general acceptance from others was uniquely associated with higher levels of body acceptance by others, and body acceptance by others was uniquely associated with body function, body appreciation, and intuitive eating. Thus, when people perceived that others were accepting of their body, they were more resistant to adopt an observer's perspective of their body (and hence held more of an internal body focus), felt more appreciative toward their body, and were more likely to eat according

to their hunger and satiety signals. Body function was also uniquely associated with both body appreciation and intuitive eating, upholding previous suggestions that those who primarily focus on how their bodies perform (as opposed to focusing on its external appearance) are more likely to show respect for their body and honor their bodily hunger and satiety cues so that it can function more efficiently (Avalos & Tylka, 2006). A direct path was also observed from body appreciation to intuitive eating, which is consistent with a large body of literature demonstrating that those who respect their body are more likely to exhibit greater awareness of hunger and satiety cues and a greater likelihood of honoring these cues (Bruce & Ricciardelli, 2016).

The only path not supported was the path from unconditional general acceptance from others to body function. This path was also not upheld in three specific studies evaluating the acceptance model (Augustus-Horvath & Tylka, 2011; Avalos & Tylka, 2006; Oh et al., 2012), lending additional credence to the idea that general social support from others may be insufficient for encouraging individuals to resist adopting an observer's perspective of the body. Instead, it may be that perceived acceptance *specifically* in the domain of body image may be the central variable that encourages an individual to focus on their internal body function. As such, we would suggest that future research need not model the direct association between unconditional acceptance from others to body function, but rather model its indirect effect via body acceptance by others. In sum, as there is strong statistical support for the Acceptance Model of Intuitive Eating and its hypothesized paths, researchers should now test this model using prospective designs so that temporal precedence can be established.

4.4 | Limitations, broader implications, and future directions

Several limitations and future directions are worth noting. First, the current state of the literature meant that we were only able to calculate effect sizes for cross-sectional relationships. This was also the case for the meta-analytic path models. Therefore, no inferences regarding the direction of the modeled bivariate or path relationships can be made. Although remarkably consistent associations between intuitive eating and adaptive psychological constructs were observed, it may be too premature to rely on cross-sectional data as a basis for arguing that public health approaches to eating disorder prevention should prioritize the prescription of intuitive eating principles. It is promising to see that the first population-based prospective study found intuitive eating to predict lower levels of eating disorder symptomatology and psychological distress over time (Hazzard et al., 2020), but replication in different samples is required. Furthermore, high quality, multisite, adequately powered RCTs of non-dieting interventions that investigate whether session-by-session changes in intuitive eating prospectively predict changes in mental health variables are also needed to understand whether intuitive eating is indeed a causal change mechanism, or instead a proxy for other mechanistic variables. Addressing these questions through such designs is required if we are to more strongly influence clinical and policy decision making around the prioritization of intuitive eating interventions in preventative public health programs.

Second, the assessment of intuitive eating is purely based on self-reported recall, which can introduce biases and issues with social desirability. Emerging empirical evidence has identified large discrepancies between retrospective recall and actual eating behavior. For instance, Stice et al. conducted a series of studies finding no associations between multiple self-report measures of dietary restraint and actual caloric intake over several weeks, arguing that self-report restraint scales are instead measuring *intentions* or *desires* to restrict (Stice, Cooper, Schoeller, Tappe, & Lowe, 2007; Stice, Fisher, & Lowe, 2004; Stice, Sysko, Roberto, & Allison, 2010). Given that numerous items assessing intuitive eating are, at face value, socially and personally desirable (e.g., "*I find other ways to cope with stress and anxiety than by eating*", "*I rely on my fullness signals to tell me when to stop eating*"), one cannot rule out the possibility that the research on intuitive eating research has studied people who wish or want to eat in this way, rather than people who actually eat this way. Future research needs to study the level concordance between retrospective accounts of intuitive eating patterns and actual eating behavior, ideally through intensive experience sampling or multiple-observation laboratory-based designs.

Third, there was limited variability across studies with respect to sample characteristics, including age, race, gender, and ethnicity. This likely explains why our meta-regressions were not able to detect any consistent moderating variables. As meta-regressions can only explore relationships *between* studies, these null results should not be taken as definitive evidence that the sample characteristics examined here are not relevant to the relationships tested. Pooling individual participant data from multiple, sufficiently diverse studies would be an important method for better understanding which sample characteristics affect intuitive eating's relationship to other psychological variables.

5 | CONCLUSION

In sum, this meta-analytic review found consistently strong support for intuitive eating's connection to a range of adaptive constructs. Intuitive eating was inversely associated with numerous indices of eating pathology, body image disturbances, and psychological distress, and positively associated with a broad range of positive psychology constructs. We also found evidence that men reported significantly higher levels of intuitive eating than women. We were able to validate the pathways specified in the Acceptance Model of Intuitive Eating via meta-analytic path analyses. As there is a solid cross-sectional evidence base linking intuitive eating with a range of mental health variables, attention should now be turned toward

understanding the temporal and possible causal nature of these relationships.

CONFLICT OF INTERESTS

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data used for the meta-analysis can be obtained upon request from the corresponding author.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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